



**On the Mechanism of Building Core Competencies:
a Study of Chinese Multinational Port Enterprises**

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Abstract

This study aims to explore how Chinese multinational port enterprises (MNPEs) build their core competencies. Core competencies are firms' special capabilities and sources to gain sustainable competitive advantage (SCA) in marketplace, and the concept led to extensive research and debates. However, few studies include inquiries about the mechanisms of building core competencies in the context of Chinese MNPEs. Accordingly, answers were sought to three research questions:

1. What are the core competencies of the Chinese MNPEs?
2. What are the mechanisms that the Chinese MNPEs use to build their core competencies?
3. What are the paths that the Chinese MNPEs pursue to build their resources bases?

The study adopted a multiple-case study design, focusing on building mechanism of core competencies with RBV. It selected purposively five Chinese leading MNPEs and three industry associations as Case Companies.

The study revealed three main findings. First, it identified three generic core competencies possessed by Case Companies, i.e., innovation in business models and operations, utilisation of technologies, and acquisition of strategic resources. Second, it developed the conceptual framework of the Mechanism of Building Core Competencies (MBCC), which is a process of change of *collective learning* in effective and efficient utilization of resources of a firm in response to critical events. Third, it proposed three paths to build core competencies, i.e., enhancing collective learning, selecting sustainable processes, and building resource base.

The study contributes to the knowledge of core competencies and RBV in three ways: (1) presenting three generic core competencies of the Chinese MNPEs, (2) proposing a new conceptual framework to explain how Chinese MNPEs build their core competencies, (3) suggesting a *solid anchor point* (MBCC) to explain the links among resources, core competencies, and SCA. The findings set benchmarks for Chinese logistics industry and provide guidelines to build core competencies.

Declarations

This work has not previously been accepted in substance for any degree, and it is not being concurrently submitted in candidature for any degree.

This thesis is the result of my own investigation, except where references were explicitly indicated in the text and the reference list.

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Acronym

DCF	Discounted Cash Flow
DWT	Dead Weight Tonnage
EDI	Electronic Data Interchanges
GBA	Greater Bay Area
IO	Industry Organization
JV	Joint Venture
KPI	Key performance indicator
LSPs	Logistics Service Providers
M & A	Merger and Acquisition
MBCC	Mechanism of Building Core Competencies
MNPEs	Multinational Port Enterprises
MOT	Ministry of Transport of the PRC
OPR	Optimal Portfolio of Resources
PRD	Pearl River Delta
RBV	Resource-Based View
ROA	Return on Assets
ROE	Return on Equity
ROI	Return on Investment
SASAC	State-Owned Assets Supervision and Administration Commission
SBU	Strategic Business Unit
SCA	Sustainable Competitive Advantage
SOEs	State-Owned Enterprises
TEU	Twenty-Foot Equivalent Units
TP	Typology and Phase
VRIN	Valuable, Rare, Imperfectly imitable, Non-substitutable
VRIO	Value, Rarity, Imitability, Organization

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Key words: Core competencies, RBV, Dynamic capabilities, Building mechanism, Chinese Multinational Port Enterprises, Digital logistics ecosystem, Typology and phase, Optimal portfolio of resources

Definitions

Capability

‘Capabilities are formed through the coordination and integration of activities and processes, and are the product of collective learning of individual assets.’ (Hafeez et al., 2002, p.29)

Collective learning

Collective learning is ‘a social process of cumulative knowledge, based on a set of shared rules and procedures which allow individual to coordinate their actions in search for problem solutions’ (Capello, 1999, p.354/s162).

Competitive advantage

‘A firm is said to have a competitive advantage when it is implementing a value creating strategy not simultaneously being implemented by any current or potential competitors.’ (Barney, 1991, p.102)

Competence building mechanism

‘Core competence building is any process by which a firm qualitatively changes its existing stock of assets and capabilities, or creates new abilities to coordinate and deploy new or existing assets and capabilities in ways that help the firm achieve its goals.’ (Sanchez, Heene, and Thomas, 1996, p.8)

Core competencies

‘Core competencies are the collective learning in the organization, especially how to coordinate diverse production skills and integrate multiple streams of technologies.’ (Prahalad and Hamel, 1990, p.82)

‘Core competence is communication, involvement, and a deep commitment to working across organisational boundaries.’ (Prahalad and Hamel, 1990, p.82)

‘If core competence is about harmonizing streams of technology, it is also about the organization of work and the delivery of value.’ (Prahalad and Hamel, 1990, p.82)

Dynamic capabilities

Dynamic capabilities are defined ‘as the firms’ ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments’ (Teece et al., 1997, p.516).

Knowledge

‘Knowledge is a specific pattern of interpretation—the ability to interpret and reinterpret the changing environment—that results from the experiences and interactions of organisational members with each other and with the social environment.’ ‘Knowledge can also be regarded as dynamic capability sustaining competitive advantage.’ (Wilkens, Menzel and Pawlowsky, 2004, p.13)

Mechanism of building core competencies (MBCC)

MBCC is a process of changes of *collective learning* in effective and efficient utilisation of resources of a firm in response to critical events. MBCC is a responsive mechanism to build core competencies of a firm given an optimal resources base the firm owns or controls.

Path-dependency

‘Where a firm can go is a function of its current position and the paths ahead. Its current position is often shaped by the path it has travelled.’ ‘The notion of path dependencies recognize that history matters’. ‘A firm’s previous investments and its repertoire of routines (its “history”) constrain its future behavior.’ (Teece et al., 1997, pp.522, 523)

Resources

‘Resources are the unique combination of assets and capabilities within a firm that allows it to develop and implement strategies to improve its overall performance.’ (Zubac, Hubbard and Johnson, 2010, p.518)

RBV

RBV is defined as ‘...to look at firms in terms of their resources rather than in terms of their products.’ ‘Resources position barriers were defined as partially analogous to entry barriers.’ (Wernerfelt, 1984, p.179)

Routines

‘Routines result from history, experience, and collective learning of the firm.’ ‘Routines are patterns of interactions that represent successful solutions to particular problems.’ (Hafeez et al, 2002, pp.30, 31)

Strategy

‘According to the resource-based view (RBV) strategy can be defined as emergent pattern of interaction generating core competencies and dynamic capabilities.’

(Wilkins, Menzel and Pawlowsky, 2004, p.8).

Sustained competitive advantage

‘A firm is said to have a sustained competitive advantage when it is implementing a value creating strategy not simultaneously being implemented by any current or potential competitors and when these other firms are unable to duplicate the benefits of this strategy.’ (Barney, 1991, p.102)

Theory

‘A theory is an explanation of something or an understanding that the researcher develops.’ (Creswell, 2013, p.85)

Chapter 1 Introduction

Chinese MNPEs have secured their SCA in the marketplace,¹ despite the uncertainties of the global environment: challenges arising from the US-China trade friction, the impact of the Covid-19 pandemic, and the complex geopolitical environment over the past few years. Seven Chinese ports ranked among the top 10 of the world-class ports in terms of cargo throughput and container port traffic in 2018.² According to an officer of the Chinese MOT, Chinese ports have achieved major developments with high quality in the period of the last 13th ‘Five-Year Plan’. China has begun to build its ports into world-class ports with emphases on safe and intelligent operations, and these ports will play key roles in serving the Nation’s strategies (CCTV, 2020; Chinaports, 2020). In addition, Chinaports released the ‘Report on ports business environment 2020’ in April, 2021, which pointed out that the efficiency of container handling at Chinese major coastal terminals has been greatly improved by automatic port operation. The container-handling rate is 30 containers per hour, and the averaged delivery time per container is about 22 minutes, breaking world’s records (Chinaport, 2021). These successes were attributed to the efforts of Chinese MNPEs to build core competencies by acquiring strategic resources, conducting innovation in business models and operation, and using advanced technologies.

Although many studies have aimed to identify the core competencies, few studies have investigated *how* Chinese MNPEs built their core competencies in the first instance. This question of *how* needs a comprehensive answer in order to give a

¹ According to the statistics of the Ministry of Transport of China (MOT) and the China Port Association (Chinaports), China has 2,076 coastal berths capable for accommodating vessels with capacity of 10,000 DWT or above by 2019 (MOT, 2020; Chinaports, 2020).

² Among these top 10 world-class ports are Shanghai port No. 1, Ningbo Port No.3, Shenzhen Port No.4, Guangzhou Port No.5, Hong Kong Port No. 7, Qingdao Port No. 8, and Tianjin Port No.9, respectively (CCTV, 2020; Chinaports, 2020; Nippon.com, 2021).

holistic view as to understanding Chinese MNPE's successes, and perhaps, in answering this question it can aid global trade successes. Examining core competencies, from the perspective of the utilisation of resources, became paramount in trying to answer this question of *how*. Focusing primarily on the mechanism of building core competencies in the context of the Chinese MNPEs' operation, this investigation led to an understanding of the successes of the subject Chinese MNPEs interviewed, and the structures of their resources being deployed.

1.1 Context of the research

Over the last two decades, Chinese logistics enterprises have rapidly developed amid many challenges. These challenges include increasing demand from international distribution due to globalization of the world's economy, advanced information technology, e-commerce, industry restructuring, mergers and acquisitions (M & A), and higher service expectations from international customers (Liu, Grant, McKinnon and Feng, 2010, p.848). These challenges prompted Chinese MNPEs to seek new ways to maintain their SCA to achieve superior performance (Liu et al., 2010, p.848). These Chinese MNPEs (hereinafter called Cases or Case Companies) became a key part of this research because they operate in global logistics services (in the port sector) and in a rapid transformation environment. Within this context, the main industry players became integrated logistics services providers (LSPs); and they provide multiple logistics services including transportation, cargo handling, warehousing, inventory management, packaging, and freight forwarding (Liu et al., 2010, p.847 and p.848).

1.1.1 Features of the Chinese logistics industry

In recent years, Chinese State-owned enterprises (SOEs) have become increasingly active by establishing overseas subsidiaries or acquiring overseas companies. Such

cross-border M & A practice appears to be a useful tool through which Chinese companies expand their business worldwide. Such active engagements echo the Chinese Government's 'Belt and Road' initiative. Global logistics is a knowledgeable, labor-intensive, and capital-intensive industry; hence, industry players need to understand rapidly the operation of such changes and the customers' needs in order to maintain SCA (Yang, 2016, p.285). As such, Chinese logistics industry has three main features that are imperative to be understood in the context of this research. First, industry players are integrated LSPs, as they engage in a variety of logistics services including cargo transportation, warehousing, loading and unloading of cargo, packaging, and freight forwarding. Second, industry players play a key role in domestic and international economic development. Third, the industry is shifting from hardware-based interfaces toward knowledge-intensive and software-based interfaces (Thai and Yeo, 2015, p.336). These integrated LSPs can offer 3rd or even 4th party logistics services, which are integrated into the maritime supply chain from traditional port-to-port services or into cargo handling and storage services. In addition, they have registered outstanding performances in their international operations, raising questions surrounding the understanding of their key roles within international business (Dura and Ciurlau, 2011, p.126).

1.1.2 Sectors of the logistics industry

There are multiple sectors in the logistics industry. It includes maritime transportation³, port operation⁴, warehousing⁵, and integrated logistics services⁶; and

³ Maritime transportation involves ships operation, and it is the bridge which connects the Chinese logistics industry with the rest of the world.

⁴ Ports are the original places for exporting goods and the destinations of imported goods, where goods are collected and distributed to customers through terminal operation which include container loading and unloading and container yard storage.

⁵ The warehouse sector includes storage, packaging, and distribution of containers or goods.

⁶ The integrated logistics service sector includes supply chain management which covers logistics

the port operation sector is the subject of this study. In China, ports are usually built at strategic geographical locations of coastal cities or within key economic development zones such as the Yangtze River Delta, Pearl River Delta, Baohai Rim, or Hainan. Ports are classified into hub ports and feeder ports: hub ports are situated along the coastal lines, and feeder ports are located along riverbanks. Hub ports are open for major international ocean liners with mega-ship operations, and feeder ports provide shuttle services to hub ports. The port operating sector is characterized by extensive capital construction and huge tangible assets of heavy plants and equipment that provide fundamental logistics services. A key port is a critical link in the logistics industry chain. It is an integrated hub port where different modes of transportation are exchanged, and it is a centre of logistics information and services. Around a hub port, various related participants and administrative regulators involve in operation, including terminal operators, freight forwarders, truck operators, warehousing services providers, cargo inspection agents, maritime supervision, and Customs. The functions of a port include various parts, such as container handling, warehousing, distribution, transportation, and Customs clearances. Maritime transportation and port operation play critical roles in global trade; according to the statistics of UNCTD (2019), ‘around 80 percent of the volume of international trade in goods is carried by sea, and the percentage is even higher for most developing countries’. ⁷

1.1.3 Operating context of the Chinese MNPEs

Chinese MNPEs operate in a complex context with both domestic and international

services involved in other logistics sectors, such as the 4th party logistics services. Auxiliary port facilities provide different services including Customs clearance, cargo inspection, and shipping agency.

⁷ In 2019, Chinese coastal ports handled 9,187 million tons of cargo, among which 3,855 million tons are foreign trade cargos, and 231 million TEUs of containers (MOT, 2019). Statistics showed that in 2019 Chinese ports handled a total volume of 261 million TEUs of containers (MOT, 2019), while the total volume of containers handled by world ports is 793 million TEUs (UNCTAD, 2019), which means that a significant 33 percent was contributed by China.

operations. The operating context of Chinese logistics industry is influenced by Government policies, business systems, and intermediate institutions (Liu and Mckinnon, 2016, p.974). Such context, characterised by huge capital investments both at home and abroad and the swift environmental challenges, has prompted Chinese MNPEs to suit their core competencies to different challenges. Due to the globalisation of the world's economy and the rapid development of the Chinese economy, Chinese MNPEs' overseas expansions became common practice. In addition, since economic development phases of countries vary; there exist opportunities for countries which have the comparative advantage to transfer their existing technologies to other developing countries (Mascarenhas, Baveja and Jamil, 1998, p.122). Further, even among developing or developed countries, bilateral investments in various industrial sectors are also promoted. Furthermore, China launched the 'Belt and Road' initiative in 2013 becoming wider open to the world; hence, Chinese MNPEs follow the initiative in cooperation with other countries. Accordingly, worldwide logistics play an even more important role in global trade. Because of the complexity of the context, the business competition, and various kinds of risks, Chinese MPNEs are facing severe challenges as well as potential development opportunities ahead.

1.2 The research problem

Chinese MNPEs are encountering severe challenges, e.g., global political and economic uncertainties, competition, technological changes, and development opportunities. This then posits the questions of *how* they build core competencies to sustain successes and *what* are the specific mechanisms that they used to build such core competencies. Although literature suggests diverse theories and concepts about the sources for SCA, a significant lack was identified in studies about the mechanism

of building core competencies (as a source for SCA) that were applied by Chinese MNPEs. Since core competencies are derived from effective and efficient utilisation of strategic assets and resources, a practical problem emerges as how Chinese MNPEs utilise resources to build their core competencies. In this regard, the research problem was proposed to find out what are the building mechanisms used by Chinese MNPEs in order to understand and explain how they build core competencies.

1.2.1 Research questions and purposes

The main research question of the study is how Chinese MNPEs build their core competencies. The purposes of the study are (1) to understand and explain how Chinese MNPEs build their core competencies, (2) to provide a managerial tool to examine the characteristics of core competencies and the building paths, and (3) to contribute to the knowledge of the concept of core competencies and RBV. Accordingly, the study addressed three specific research questions:

- (1) What are the core competencies of the Chinese MNPEs?
- (2) What are the mechanisms that the Chinese MNPEs use to build their core competencies?
- (3) What are the paths that the Chinese MNPEs pursue to build their resources bases?

1.2.2 Importance of the research topic

The mechanism of building core competencies is the important link among resources, capabilities, strategies, SCA, and economic rents because it governs generation of core competencies. The relationship is that in order to maximize shareholders' return on equity (ROE), a firm needs to secure its competitive advantage in the marketplace; and such advantage is achieved by its competitive strategies. Further, the formulation of a firm's strategies depends on the features of the services of resources and competencies; therefore, a firm needs to build its core competencies (Grant, 1991,

p.114 and p.115). Obviously, the research gap in terms of building mechanism of core competencies was emerged in both literature and practice within the context of the Chinese port sector. Previous research has mainly focused on identifying core competencies (Mascarenhas et al., 1998; Meschi and Cremer, 1999; Hafeez et al., 2002; Edgar and Lockwood, 2011; Huang, Chen, Yu, and Zhu, 2019; Lan, Liu, Huang and Zeng, 2020). However, few studies have been reported on the mechanism of building core competencies, especially in the context of Chinese MNPEs. What is important to note is that Chinese MNPEs own huge assets and operate worldwide, providing transportation, warehousing, container handling, and consolidation services. Hence, their business activities warrant further investigation and academic research. In addition, the researcher's own experience and knowledge in this area thus come into play because a personal and experienced viewpoint can be drawn upon. Further, such experience in logistics industry can help understand the research problem and to facilitate the investigation in terms of data gathering, analysis, and interpretation (Yu, 2018, p.9).

Theoretically, since core competencies can be used to explain how a firm is able to outperform its competitors; it is important to understand what core competencies a firm possesses in order to protect and develop such core competencies (Nordhaug and Gronhaug, 1994, p.95). In addition, since Chinese MNPEs operate on capital-intensive assets⁸, the concept of core competencies becomes ever important to be understood. Accordingly, the theories applied in the research include RBV, the concept of core competencies, dynamic capabilities view, and knowledge-based view. This research thus focused on what building mechanisms that are used by Case

⁸ Chinese MNPEs generally possess tangible assets with more than 60 percent of the total assets of firms (source: Annual reports of Case Companies).

Companies to build their core competencies with the adoption of RBV because the concept of core competencies is closely linked to RBV. Further, the RBV theory helps understand the operation of Chinese MNPEs logistics enterprises that have huge tangible operating assets.

Practically, Chinese MNPEs are facing even more challenges in terms of uncertainties of global operation, complex geopolitics, intensified competition, rapid development of technology, and diverse customers' demands. In order to cope with these challenges, companies need to outperform their competitors by aligning their strategies and resources (Winfrey, Michalisin and Acar, 1996, p.199). This alignment means that a firm should be strategic fit (Venkatraman and Camillus, 1984, p.513). To cope with this situation, a firm needs to be adaptive to rapid changes in the business environment; which means a firm should be strategically flexible (Harrigan and Dalmia, 1991, pp.4-9). Strategic fit and flexibility require firms to answer the question of how they build capabilities and strategies in order to achieve their SCA.

Methodologically, reality is complex, and it can be seen and interpreted from different perspectives. Specifically, appropriate research methods can be deployed to the study; and the research adopted the constructivism paradigm (Morgan and Smircich, 1980, pp.494-495) and the emic perspective to understand the interviewees during in-depth interviews and desk-based research for data collection. Thematic analysis and logical model approach were also employed for data analysis (Yin, 2018, p.186) wherein cause-effect patterns analysis were used. Further, since facts do not tell any meaning themselves, facts need to be interpreted to give meaning to the phenomenon. This view suggests the adoption of the constructivism paradigm to understand the reality of how Chinese MNPEs build their core competencies. Thus, the multiple-case study

design was adopted as the overall research strategy. This constructivism paradigm filtered the data through a qualitative perspective by interpreting facts and placing them into context, thus it aided in the explanation and understanding of how Chinese MNPEs built their core competencies.

1.3 Structure of the dissertation

This dissertation consists of seven chapters covering the research questions, activities, and results of the research. The research expected that the core competencies of Case Companies and the building mechanisms of core competencies could be identified by virtue of the research design and the execution of such.

- **Chapter 1 Introduction** provides the backdrop of the research in terms of industry, sectors, and the operational context, and it presents the research problem and research questions.
- **Chapter 2 Literature review** focuses on the theories and concepts relevant to the study, which include the concept of core competencies (Prahalad and Hamel, 1990) and the RBV (Wernerfelt, 1984). The review outlined the apparent research gap that exists in term of building mechanism of core competencies of Chinese MNPEs. In addition, it suggests that the definition of core competencies by Prahalad and Hamel (1990) is valuable to investigate the mechanisms of building core competencies by Chinese MNPEs.
- **Chapter 3 Methodology** expounds the philosophical assumptions and the adoption of the multiple-case study design and the 5-Rs research approach. It addressed a protocol for data collection that includes two data resources: the company documents and in-depth interviews. It also examined the adopted research methods including cross-case comparison and thematic analysis.

- **Chapter 4 Data analysis and results (individual case analysis)** presents the results of the data analyses on annual reports of five Case Companies and 11 in-depth interviews of five Cases Companies and three industry associations.
- **Chapter 5 Data analysis and results (cross-case analysis)** presents the synthesised results of the data analysis derived from cross-case comparison. With representative supporting data, such results were presented in the forms of data structure, table shell, data table, and narratives.
- **Chapter 6 Discussion** interprets the results and presents the findings.
- **Chapter 7 Conclusion** presents the theoretical implications, the managerial applications, the limitations of the research, and the suggestions for future studies.

Chapter 2 Literature review

For the research questions, this review of the literature covered relevant knowledge and theories. It addressed four aspects of the concept of core competencies: (1) the relevant theoretical boundaries of the concept, (2) the basis of competitive strategy, (3) the sources of SCA, and (4) the building mechanism of core competencies. The key outcome of the literature review is the decomposition framework of core competencies (Figure 1) which is used as the guide to the research. Specifically, this review examined studies of sources of SCA, RBV, and the concept of core competence. It examined the main streams of RBV, main schools of thought of the concept of core competencies, and it traced the evolution path of the concept of core competence. It further examined the manners of creating, utilizing, and leveraging of core competencies. The literature review focused on the building mechanism of core competencies in the context of Chinese MNPEs' global logistics operations from the RBV, and it absorbed knowledge from relevant theories. Such theories include the growth of the firm (Penrose (1959); VRIN, VRIO, and sources of competitive advantage (Barney, 1991; Barney and Hesterly, 2010); dynamic capabilities (Teece et al., 1997); knowledge-based view (Grant, 1996); organisational learning (Wilkins, Menzel, and Pawlowsky, 2004; Crossan, Lane, White and Djurfeldt, 1995). It also includes theories of the competitive strategies (Porter, 1980) and competitive advantage (Porter, 1985).

Competitive advantage is the most critical issue of a firm's operation in competitive environment (Klein, 2002, p. 317). The objective of corporate strategic management is to achieve economic rents through creating SCA. However, the term of competitive advantage was not explicitly defined (Klein, 2002, p.317). In fact, over the past decades, enormous efforts have been made in the study of strategy for sources of SCA.

Even though, the debates on SCA varied in a number of facets, and such debates can be reasonably explained as that the reality is multiform and multilayered and cognitions engage only some of the characteristics of such reality (Lektorskii, 2010, p.34).

Literature furnished the most frequently debated theories and views about achieving SCA. Specifically, such theories and views include (1) Industry organization approaches (IO) (Porter, 1980), (2) RBV (Penrose, 1959; Wernerfelt, 1984; Barney, 1991); (3) core competencies (Prahalad and Hamel, 1990); and (4) the dynamic capabilities perspective (Teece et al, 1997). In addition, other relevant theories include (1) Knowledge-base view (Gupta and Govindarajan, 1991), (2) the Relational network view (Dyer and Singh, 1998), and (3) Organisational learning (Wilkens et al., 2004; Crossan et al., 1995). These theories and concepts provide insights on the sources of SCA from external or internal perspectives, and they induced successive studies on the debated issues. Whilst some of these theories have become more extensive and deeper as studies proliferate, the IO approaches of Porter (1980), RBV of Wernerfelt (1984), and the dynamic capabilities of Teece et al. (1997) remain as main paradigms in strategy studies.

2.1 Main approaches to study SCA

Generally, the IO approach (Porter, 1980) and the RBV (Penrose, 1959; Wernerfelt, 1984; Barney, 1986) are the two main approaches to the study of strategy; and each approach has variants. Although both approaches explain the relationship among the resources, strategies, and SCA; RBV is deemed as the appropriate approach to this study because Case Companies are port operators, and they possess huge tangible assets and intangible resources. Such operating assets and resources (e.g., cargo

handling terminals, warehouses, equipment and plants, technologies, and systems) deliver required services to customers, and they are the basis for developing corporate strategies to achieve SCA for economic rents. Such resources also secure competitive advantage of a firm; as ‘competitive advantage is...also a function of the “assets” one has to play with, and how these assets can be deployed and redeployed in a changing market’ (Teece et al., 1997, p.529).

2.1.1 Penrose vs. Porter approaches

Resources of a firm are fundamental elements for formulating competitive strategies to achieve SCA, and IO approach and RBV are two contrasting approaches to the study of the sources of SCA. The IO approach was advocated by Porter (1980), and later it was renovated by the game theory and new industrial organization economics (Tirole, 1988; Shapiro, 1989). While the international business literature on business strategy focused on IO approach of Porter (1980) and other scholars (Manikutty, 2010, p.1); some seminal papers claimed RBV (Penrose, 1959; Wernerfelt, 1984; Barney, 1986; Peteraf and Barney, 2003; and Teece et al., 1997). Subsequently, these two approaches (RBV and IO approach) were debated under the heading of ‘Penrose vs. Porter’.

On the one hand, the IO approaches of Porter (1980) consists of the competitive forces approach of Porter (1985), and the strategic conflict approach of Shapiro (1989). These IO approaches of Porter (1980) were based on the paradigm of Bain-Mason-Scherer, the structure-conduct-performance (SCP) which stressed influences of market power (Foss, 2002, pp.147-151). The basic concepts of IO approaches (Porter, 1980) include the industrial entry barriers, which suggests that such barriers create obstacles to defend firms’ industrial positions against the

competitors. By IO approaches, Porter (1980) holds the view that the market is static; therefore, firms should take strategic actions to break the equilibrium to achieve advantages. Such actions include creating industry entry barriers, investment in R & D for innovation, and marketing campaigns. IO approach (Porter, 1980) focuses on industry rather than firms, and it considers that the abilities of firms (to manipulate in the market to maintain mobility, entry barriers, and entry–deterrence) are the sources of economic rents. It deems that strategy is about to deploy delicate game plays given resources in the product market situation to capture monopoly economic rents.

On the other hand, RBV includes theories such as ‘the growth of the firm’ by Penrose (1959), RBV by Wernerfelt (1984), sources of SCA by Barney (1986), the concept of core competencies by Prahalad and Hamel (1990), RBV by Mahoney and Pandian (1992), RBV and competitive advantage by Peteraf (1993), and dynamic capabilities by Teece et al. (1997). RBV considers a firm as a collection of productive resources, which possesses a bundle of heterogeneous resources (Penrose, 1959, p.77). The main issues of RBV include resources, capabilities, and core competencies. Generally, resources are tradable in factor markets; while capability or core competencies are not tradable. For RBV, resources refer to those tangible and intangible assets owned or controlled by a firm, such as product brands, technical know-how, skillful employees, machinery and plants, operational and managerial procedures and capital (Teece et al., 1997, p.510). RBV was influenced by the Chicago View, which stresses that entry barriers and deterrence are informational and the concentration is derived from operational efficiency. Therefore, returns are derived from firms’ assets base, rather than from monopoly (Foss, 2002, p. 150 and p. 151). RBV holds that a firms’ resources base creates sources for SCA if it satisfies four criteria: heterogeneity, ex-ant limits to competition, ex-post limits to competition, and imperfect mobility.

First, heterogeneity means a firm achieves the efficiency of heterogeneity across its resources. Second, ex-ante limit to competition means a firm is able to acquire resources with price below its net present value (NPV). Third, ex-post limit to competition means that the firm possesses resources that are difficult to be imitated by competitors. Fourth, imperfect mobility means that resources should be firm-specific (Foss, 2002, p.151 and p 152).

2.1.2 Understanding IO approaches and RBV

Early international business strategy literature mainly concerned about the IO approaches of Porter (1980), which were regarded as the global business strategy applied by international firms. Generally, IO approaches Porter (1980) engaged three types of competitive strategies, i.e., manufacturing, distribution, and marketing. In most cases, IO approaches emphasized on competitive positions of organizations in external environment; but it failed to explain the phenomena and the role of internal factors such as resources, processes, and competencies. Prahalad and Hamel (1990) pointed out that global firms achieved their competitive advantage not only through products but also through geographical areas. Manikutty (2010) supported this view asserting that (1) the assumption of IO approach (Porter, 1980) may changes in the case of global firms; and (2) such firms have subsidiaries all over the world (p.1). The IO's perspective gave rise to opposite thoughts. Accordingly, after Porter (1980), Wernerfelt (1984) proposed the RBV; and Prahalad and Hamel (1990) posed the concept of core competencies, suggesting that the sources of competitive advantage are derived from firm resources.

Both IO approaches and RBV assumed a perfect world, implying that competitive advantage, therefore, the economic rents result from the imperfect market conditions

(Foss, 2002, p.161). The contrast of these two approaches revealed the main features of each approach. IO approach (Porter, 1980) focuses on industrial manipulations, while RBV (Wernerfelt, 1984) addresses the utilisation of internal resources. The IO approach posits that the formulation of strategies is based on the dynamics in industry environment from where come the sources of SCA. It focuses on product market imperfect operation, entry deterrence, strategic intervention, and external business environment to explain the success of achieving SCA. The RBV regards a firm as a bundle of strategic resources that are the basis for formulation of strategies to achieve SCA. RBV proposed to 'analyse firms from the resource side rather than from the product side' (Wernerfelt, 1984, p.171). Barney (1991)'s RBV version typically stressed the source of firms' SCA and focuses on firms' internal strategic resources with VRIN or VRIO attributes to achieve supernormal operation results. Thus, for the purpose of the research questions and based on the business nature of the Case Companies, the RBV is considered as the appropriate perspective to the study.

2.2 Other thoughts of sources of SCA

However, literature suggests other ways to look at the sources of SCA: (1) the Knowledge-based approach (Grant, 1996), and (2) the Organisational learning and Knowledge management (Wilkens et al., 2004; Crossan et al., 1995). The Knowledge-based approach stressed on the integration of individual knowledge by using two types of mechanisms, the direct mechanism and organisational routines, and the integrated knowledge provide necessary knowledge for performing a task (Grant, 1996, p.379). The organisational learning approach suggests that organisational learning and knowledge management help understand the generation of competences. These two approaches stressed on the knowledge integration and learning aspects, which are relevant to the understanding of the sources of SCA because both

knowledge and organisational learning are primarily regarded as the resources of a firm.

2.2.1 Knowledge-based approach

The knowledge-based view of Grant (1996) is a valuable approach to understand sources of SCA because it is concerned with the ability of knowledge integration as the critical source of competitive advantage. This view suggests that a firm's management should concentrate on this capability to create unique advantages and maintain them against imitation by competitors. Grant (1996) presented his knowledge-based theory of organisational capacity in his paper 'Prospering in Dynamically-Competitive Environment: Organisational Capability as Knowledge Integration'. This knowledge-based theory is defined as the organisational capacity that integrates the individual special knowledge of a firm (Grant, 1996, p.375). It emphasised that organisational capacity is the fundamental basis for strategic formulation, and it is used to identify productive opportunities and to capture competitive advantage in unstable market competition. Grant (1996) mentioned that his study drawn on other theories including RBV, organisational capabilities and learning (p. 375). He considered that the most important resource of a firm is the knowledge, which is embedded in individuals of a firm. He supported the view that resources and organisational capabilities are all sources of SCA and the grounds for strategy formulation. This knowledge is defined as explicit knowledge in the form of documented or undocumented know-how, skills, or expertise. Therefore, a firm is viewed as an organisation for integration of knowledge of individual specialist skills for production (Grant, 1996, p. 377).

In order to integrate individual's knowledge, two proposed mechanisms were

proposed: the directing mechanism and the organisational routine mechanism (Grant, 1996, p.377). The directing mechanism integrates relevant knowledge toward a specific task (which is documented), thus providing necessary knowledge for performing the designated task. The organisational routine mechanism refers to the coordination of sequential patterns of interaction of special knowledge (Grant, 1996, p.379). These mechanisms provide effective communication within an organisation, and enhance capability to respond to the changing environment. Yet, in order to understand fully the idea of knowledge integration, it is important to note that knowledge integration has a further three characteristics, efficiency, scope, and flexibility (Grant, 1996, p.379). These characteristics aid in establishing a competitive advantage, and secure economic rents (Grant, 1996, p.380). Thus, taking into consideration of Grant's theory (1996) and its definitions of knowledge thereof helps understand the building mechanisms of core competencies, and it helps this research considerably.

2.2.2 Organisational learning and knowledge management

Another valuable approach to understand the sources of SCA is the organisational learning of Wilkens et al. (2004), whereby two themes can be used to decompose the generation of core competencies. These two key themes, organisational learning and knowledge management (Wilkens et al., 2004, p.8 and p.9), help understand the definition of core competencies of Prahalad and Hamel (1990) by decomposing the definition. According to Wilkens et al.'s (2004) method, the definition of core competencies (Prahalad and Hamel, 1990) can be decomposed into *capability* (collective learning), *process* (integration and coordination), and *resources* (skills and technologies). In addition, since strategies, based on RBV, can be interpreted as emergent patterns of interaction that generates corporate core competencies and

capabilities; management process of knowledge would include identification, diffusion, integration, and enactment of the business environment (Wilkens et al., 2004, p.8). Accordingly, they synthesized organisational theories with the concepts of knowledge management to show how organisational theories approach the causal ambiguity argument of RBV (Wernerfelt, 1984), and explain how core competencies are generated. They also pointed out that the shared mental model of individuals is a method to explore the process for generating core competencies (Wilkens et al., 2004, p.8). Wilkens et al. (2004) linked corporate strategy with core competencies by suggesting that strategy is derived from the pattern of interaction that generates core competencies. Accordingly, they linked organisational learning and knowledge management to understand and explain the generation of core competencies (Wilkens et al., 2004, p.8). Specifically, they pointed out that learning theories help explain the causal ambiguity argument and explain RBV (Wilkens et al., 2004, p.8). Further, they point out that knowledge management processes help explain and explore process to generate core competencies (Wilkens et al., 2004, p.8). Their approach is complementary to Grant's (1996) knowledge-based approach because knowledge and learning are closely related concepts which provide critical links in the mechanism of building core competencies.

2.3 Main schools of thought of RBV

Managerial practitioners use RBV as a managerial framework to determine firm's strategic resources so that they can exploit such resources to achieve SCA. RBV is an interdisciplinary approach to strategy study by drawing up economics, law, finance, marketing, supply chain, operation, and management; however, it was considered fragmentary until Barney (1991). Then, he posed that resources should satisfy four tests as VRIN in order to be strategic assets for sustainable resources, and he revised

these tests to VRIO in 2011. Barney (1991), influenced by Wernerfelt (1984), was considered as a guru to make RBV intact as a theory by his article of ‘Firm Resources and Sustained Competitive Advantage’. RBV is a paradigm in strategic management discipline and a theory of competitive advantage (Wilkens et al., 2004, p.9); it has a spectrum.

Broadly, assets, capabilities, and competencies are resources of a firm. Specifically, there are three main schools of thought of RBV in terms of resources, capabilities, and competences respectively (Shafeey and Trott, 2014, p. 122 and p.123). These schools of thought include (1) RBV (rational-equilibrium) school, (2) Dynamic capability (behavioral-evolutionary) school, and (3) RBV (social constructionist) school (Shafeey and Trott, 2014, p.123 and p.125). In addition, a similar classification of strategic management approaches was proposed, it includes (1) RBV approach proposed by Barney (1991) and Wernerfelt (1984); (2) Competence-based perspective advocated by Prahalad and Hamel (1990) and Sanchez and Heene (1997); and (3) Dynamic capabilities approach represented by Teece et al. (1997).

2.3.1 Rational equilibrium school of thought of RBV

The first school holds the view of positivism and perceives the environment as concrete, and that an exogenous market forces determine a firm’s behavior (Shafeey and Trott, 2014, p.125). This school is thought to be the RBV (Penrose, 1959; Wernerfelt, 1984; Barney, 1991, 1995) that is concerned with possessing resources with heterogeneous productivity (Shafeey and Trott, 2014, p.126). RBV perceives the firm as a bundle of resources and its internal resources as the bases of the success of the firm. Therefore, the isolating mechanism functions as the mobility barriers, which restrict firms to mimic a particular firm’s behaviors for replication of a firm’s

performance for profits (Ghoshal et al., 2002, p.304). RBV recognized heterogeneity among organizations as the sources of profits of firm (Ghoshal et al., 2002, p.304). The inclusion of capabilities and competencies in RBV are for two reasons: (1) both capabilities and competences are internal resources of a firm, and (2) it is insufficient for a firm to possess tangible assets alone to achieve SCA. Such embracing of tangible assets with VRIN attributes and intangible resources capabilities or competences enables a firm to establish solid foundations for formulating strategies to gain SCA (Badrinarayanan, Ramachandran, Madhavaram, 2019, p.24).

RBV extends to the IO perspective to explain behavior at the level of the firm in terms of firm resources (Ghoshal et al., 2002, p.304). In strategic management literature, RBV posits that firms gain SCA by deploying bundles of heterogeneous and imperfectly mobile resources with the attributes of VRIN (Barney, 1991). As such, it is RBV that investigates the firm internally for sources of competitive advantage, rather than identifying SCA from the external environment (Teng and Cummings, 2002, pp.81-83). The main proposition of RBV is that a firm should concentrate on what it can do to outperform competitors (Wernerfelt, 2014, p.22) by understanding that sources of SCA come from internal resources and capabilities rather than from product market activities. For generating rents, RBV research focused mainly on identifying various types or combinations of resources, which includes erecting market barriers based on firm's specific resources (Mahoney, 2005).

RBV emphasizes that resources with VRIN attributes enable a firm to gain SCA. RBV is a tool to explain the relationship between firm's profitability and its resources positions, and it suggests ways to manage a firm's resource position over time (Wernerfelt, 1984, p.171). Since RBV was defined as 'to look at firms in terms of

their resources rather than in terms of their products' (Wernerfelt, 1984, p.179); RBV scholars (Penrose, 1959; Wernerfelt, 1984; and Barney, 1991) had developed an 'inside out' thinking, viewing the resources of a firm as the starting point (Manikutty, 2010, p.3). This 'inside-out' theory firstly agreed that corporate assets include tangible assets, intangible assets, and capabilities (Wernerfelt, 1984; Barney, 1991; Grant, 1991; Sanchez and Heene, 1997). Other scholars hold that such firm's asset base model categorize firms' assets into five types: human, organization, technology, physical assets, and financial assets (Zubac, Hubbard and Johnson, 2010, p.518). For resources, Wernerfelt (1984) adopted the definition by Caves (1980) that a firm's resources refer to those operating tangible and intangible assets of a firm (Wernerfelt, 1984, p.171). Barney (1991) characterized RBV as 'valuable, rare, imperfectly imitable, and non-substitutable' (VRIN), and 'valuable, rare, imperfectly imitable and organization' (VRIO); and used these terms to explain the relationship between economic rents and a firm's resources (Barney, 1991, p.105-11; 2010). Thus, RBV is concerned with the efficient utilisation of a firm's resources by the management team (Wernerfelt, 1984, p.171). The relationship between tangible and intangible assets is reflected by their respective characteristics of productive services; whereby the top management team combined these two types of resources to create an integrated productive service. The management team needs to combine and exchange a firm's resources for production and providing services, thus the creation of economic value is a process of utilisation of economic resources of a firm (Ghoshal et al., 2002, p.279). Since the characteristics of tangible assets are reflected in the minds of the top management team, such characteristics become part of the knowledge and learning process of the management team. As these capabilities eventually materialise in the form of products or benefits, the quality of tangible resources is important. Therefore, the selection and acquisition of the appropriate resources, especially the selection of

appropriate tangible assets is a challenging task for management team.

2.3.2 Behavioral evolutionary school of thought of RBV

The second school also holds the view of positivism, perceiving the business environment as objective; and it concerns with synchronising market development with a firm's capabilities and technologies (Shafeey and Trott, 2014, p.127). This school is the dynamic capability approach advanced by Teece et al. (1997) and Winter (2003). Dynamic capability is defined as 'the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments' (Teece et al., 1997, p.516). Thus, dynamic capabilities reflect an organization's ability to achieve new and innovative forms of competitive advantage, given path dependencies and market positions (Teece et al., 1997, p.516). Yet, by comparison, Kikuchi and Iwao (2016, P.140) deemed that dynamic capability has its origins in that of core competencies. This definition means that dynamic capabilities are comprised of three elements: organisational and managerial processes, positions, and paths (Kikuchi and Iwao, 2016, p.141). This interpretation posits that a dynamic capability is an organisational capability, which helps firms to achieve competitive advantage in a rapidly changing environment. This dynamics is a salient characteristic of the theory of dynamic capability. It is built upon the integration of firm's resources (e.g., technical know-how, operating processes and managerial resources) and through learning, innovation, and improvement of management. Obviously, dynamic capabilities require the integration of internal and external knowledge in order to build new capabilities; thus absorbing external knowledge is the bridge from the old to new knowledge. Teece et al. (1997) claimed that dynamic capabilities are difficult to imitate because each firm has its unique and complex context wherein a firm's dynamic capabilities were built. Specifically, knowledge and processes are

interrelated within a firm; therefore, it is impossible to copy all organization's learning and process. Furthermore, imitating just part of the process of a firm would not be possible to succeed. Dynamic capability then becomes an approach that is still developing in terms of the study of strategy, and it stresses the need for adaptive abilities to cope with the ever-changing competitive environment. The critical points of dynamic capabilities are change-oriented, rapid innovation, short-term competitive view, and temporary competitive advantage view. The dynamic capability approach emphasized (1) creating managerial capabilities; (2) mustering institutional, functional, and technological skills; and (3) integrating with external assets or resources (Teece et al., 1997).

2.3.3 Social constructionist school of thought of RBV

The third school holds the view of constructivism, perceiving the environment as subjective, and it emphasizes creating market opportunities through learning new competencies and enhancing new knowledge (Shafeey and Trott, 2014, p.126). This school is the core competencies-based view of the firm (Prahalad and Hamel, 1990; Sanchez et al., 1996). Prahalad and Hamel (1990) stressed that the management team of a firm should enhance their abilities to identify, cultivate, and explore firm's core competencies because core competencies make a firm's growth possible (Prahalad and Hamel, 1990, p.79). As such, three characteristics of competencies contribute simultaneously as sources of advantage and ambiguity within this theory (Reed and DeFillippi, 1990, p.91), i.e., tacit, complexity, and specificity. Tacit (in terms of tacit knowledge) is embedded in skills components of competencies. Complexity refers to the interrelation between different skills and between such skills and assets, therefore creating ambiguity. Yet, specificity refers to the symbiosis between a firm and its customers (Reed and DeFillippi, 1990, p.91). Such skills within the core

competencies-based view are advantageous sources in that these skills provide effectiveness and efficiency. Complexity creates causal ambiguity that avoids imitation by competitors, and specificity suggests establishing long-term relationship for customers' loyalty (Reed and DeFillippi, 1990, p.91). Specifically, there are four types of asset specificity, i.e., site, physical assets, dedicated assets, and human resources. These specificities create complexity and ambiguity, therefore, barriers to imitation (Reed and DeFillippi, 1990, p.92).

2.3.4 Origins of RBV

As RBV evolves, salient milestones were noticed; and such milestones can be categorized into three types of view: resources, competencies, and capabilities. Literature on RBV shows the importance of a firm's resources for growth and the creation of the wealth of organizations, and it suggests that RBV had its origin in Penrose's (1959) theory (Badrinarayanan et al., 2019, p.24). Specifically, such milestones were established by Wernerfelt (1984) for RBV, Barney (1991) for VRIN and VRIO, Prahalad and Hamel (1990) for core competencies, Day (1994) for capabilities, and Teece et al. (1997) for dynamic capabilities (Badrinarayanan et al., 2019, p.24). Although, Wernerfelt (1984) chiefly initiated the RBV to the study of strategy, he made explicitly clear that he had made drawn upon other classic literature. Especially, he endorsed Penrose's (1959) view that resources were the starting point for strategic analysis. In addition, Wernerfelt (1984) adopted Andrew's (1971) traditional concept of strength and weakness of a firm for strategic analysis in his analysis (Wernerfelt, 1984, p. 171).

Ghoshal et al. (2002) claimed that RBV has its origin in Penrose's (1959) theory regarding a firm as a pool of idiosyncratic resources. RBV can also be dated back to

Adam Smith (1776) in terms of the organisational knowledge of division of labor as a resource of a firm (Ghoshal et al., 2002, p.283). RBV was rooted in *The Theory of the Growth of the Firm* by Penrose (1959), which can be traced to Smith's (1776) theory in *An Inquiry into the Nature and the Cause of the Wealth of Nations*. Scholars argued that the concept of core competence was also originated from Penrose (1959), Alfred Marshall (1920), and even earlier from Adam Smith's (1776) (Foss, 2002, p. 147; Ravix, 2002, p.168; Best, 2002, p.179). In her book, *The Theory of the Growth of the Firm*, Penrose (1959) posed that a firm should be regarded as an organization, which possessed certain stocks of resources that included tangible and intangible resources (Foss, 2002, p. 153). Penrose's (1959) view found its enlightenment in the seminal book of *An Inquiry into the Nature and Cause of the Wealth of Nations* by Adam Smith (1776)⁹. In his works, Smith (1776) advanced three main propositions: the division of labor, the invisible hand of the market, and the comparative advantage. Smith (1776) advocated the theory of specialization and division of labor; he considered these as the crucial productive factors that can be regarded as a type of resources of a firm in the process of wealth creation (Best, 2002, p.179). Penrose's (1959) arguments also assimilated the theory of Alfred Marshall's (1920) work, *The Principles of Economics*; where Marshall (1920) propagated that knowledge is the critical driver for production (Ravix, 2002, p.168). However, Penrose (1959) had completely changed the basic concept about firms that discussed in the Marshall's (1920) work (Foss, 2002, p.155). Since Wernerfelt (1984), RBV has developed into several variants including the organisational learning and knowledge management view (Wilkens et al., 2004); the knowledge-based view (Grant and Baden-Fuller, 1995); the dynamic capabilities (Teece et al, 1997); and the core competence

⁹ *An Inquiry into the Nature and Cause of the Wealth of Nations* by Adam Smith (1776) edited by Campell, Skinner and Rodd, 1976)

(Prahalad and Hamel, 1990). All such concepts or theories seek to substantiate the sources of SCA.

2.3.5 Structure of a firm and its resources

RBV is about firms; therefore, it is important to understand the nature of firms. A firm is an incorporated body created by laws, and it owns assets and assumes responsibilities. It acts much like a human being in that it has an adaptive form and sustains livelihoods. Its tangible assets are the basis for this *human-like* functioning in that it would not be sustainable without such. Specifically, its tangible assets (e.g., terminals, warehouse, and cargo handling equipment) are the *skeleton* of a firm, and its intangible assets (capital, systems, technologies, brands, patterns, and human resources) compose of the rest of the *body* of a firm. These resources give a clear visual of what a firm is in terms of size and power. In addition, the capital is the blood, and the structure and systems are the nerves. Moreover, the management is the brain, and its competencies are its DNA (Silva, Amoni, Ortigara, and Costa, 2014). A company is an integrated organism for business purposes, and it follows its life cycle. It can learn and grow in an organic way by acquisitions, and it dies when misfortune occurs. As RBV is concerned with resources of a firm, the structure of a firm should be adequately built in order to complement its specific resources and operation (Turvani, 2002, p.204).

As the firm functions, its resources generate productive services that it needs to sustain its production. However, it is necessary to distinguish the differences between resources and their potential services (Turvani, 2002, p.204). Resources, either tangible or intangible, are identifiable; they can be accounted as costs and depleted, depreciated or amortized. While productive services refer to the generation of

economic benefits to customers. This distinction implies that a firm can pursue its organic growth by using its tangible resources or by building its human capital or its routines (Turvani, 2002, p.204). Since tangible assets can be acquired for its salient characteristics of productive services from factor markets, their services can be flexible (Penrose, 1959, p.78).

As such, the actual utilisation of such assets depends on the knowledge and capabilities of the employees who operate and manage them. Naturally, resources reciprocally determined capabilities, as a result capabilities fused with specific resources to create productive services to the firm. In addition, such services pave the way to formulate strategies, leading to competitive advantage. However, to realize the benefits delivered by resources, the management team plays a critical role as they have the legitimate authority to obtain and utilise all resources of the firm for the purpose of the company (Turvani, 2002, p.204). Hence, the effective and efficient deployment of resources depends on the flexibility and the combination of different resources for different purposes at different place and time. Furthermore, resources would generate SCA, if they satisfy the criteria of VRIN (Foss, 2002, p.151).

VRIN is an important factor regarding resources. As RBV suggests that physical assets, human resources, and organisational routines are the firm's sources of competitive advantages, they need to be VRIN (Barney, 1991). RBV argues that a firm accumulates and develops a bundle of specialized resources that are tangible or intangible; these resources, when applied appropriately, create SCA and generate above average returns to the firm (Barney, 1986; Wernerfelt, 1984; Peteraf, 1993). Top management team of a firm has control over all resources of a firm, and it is responsible for daily operations and management. The professional and experienced

management team itself may become valuable resources too; hence, it may attract external acquisition attempts from time to time.

According to RBV, a close relationship exists between resources and competitive advantage. As RBV suggested that competitive advantage of a firm depends on firms' competitive strategies (Penrose, 1959, p.76), which were developed from their core competencies that are based on the possession and utilisation of firms' critical resources. RBV also relates to core competencies in terms of products or services and the resources, as Wernerfelt (1984) argued that products of a firm and the resources are two sides of the same coin (Wernerfelt, 1984, p.171). Again, resource was broadly defined as tangible and intangible assets possessed by the firm (Wernerfelt, 1984, p.172); Barney (1991) defined the resources as all assets that are controlled by the firm and can be utilised by the firm to implement firm's strategies (pp.101-102). Penrose (1959) distinguishes resources from services, suggesting that services refer to a function or activity, while resources are simply assets providing potential services (Penrose, 1959, p. 25).

Penrose (1959) claimed that there is a close relationship between resources and the knowledge and learning of managers in the firm (p.85). Penrose (1959) also suggested that there is close interaction between human resources and material resources in firms (Penrose, 1959, p.76). Wernerfelt (1984), Barney (1991), Grant (1991), and Sanchez and Heene (1997) agreed that corporate assets include tangible assets, intangible assets, and capabilities. Zubac et al. (2010) proposed the firm's asset base model to categorize firms' assets into five types: human, organization, technology, physical, and financial assets. Based on the definition of resources and the relationship among resources and strategy, a proposition claims that resources deliver

services to manufacture products or provide service business for market rents. Resources can be utilised and leveraged for different services or purposes; therefore, the type, size, and quality of resources determine the firms' activities (Prahalad and Hamel 1984, p.171). Wernerfelt (1984) treated resources as capabilities and claimed that capabilities consist of assets that could contribute to competitive advantage. By his definition of capabilities, Teece et al. (1984) also recognised the linkage between resources and competitive advantage (Ray and Ramakrishnan 2006, p.12).

2.3.6 The relationships among skills, technologies, and assets

Within RBV, a close relationship exists among skills, technologies, and assets; these resources are complementary, not mutually exclusive. Production skills and technologies require the use of certain related assets to produce and deliver new products and services. Thus, such related assets, usually the tangible assets, determine firm's competitive advantage (Teece et al., 1997.p.521). According to Prahalad and Hamel (1990), core competence is about three things: the collective learning, the resources, and the coordination or integration of such resources. Prahalad and Hamel (1990) mentioned production skills and technologies that are the intangible resources of a firm. However, it is obvious that such intangible resources should be complementary with materialistic objects such as tools for production skills, and machines for technologies. In fact, Prahalad and Hamel (1990) did not deliberately ignore the tangible resources; instead, they stressed the capability aspect, i.e., the importance of HR in production services. In addition, the tangible asset aspect has been extensively addressed by the traditional RBV by Penrose (1959), Wernerfelt (1984), and Barney (1991). The evolution of RBV did not stop there; it has been endorsed by the knowledge-based view by Grant (1996) and the dynamic capability theory by Teece et al. (1997). This research holds the view that Prahalad and Hamel's

(1990) argument should be taken as the expansion to the traditional view of RBV, and it should include thoughts of tangible and intangible resources, and capabilities.

2.3.7 Understanding capabilities

Core competencies and the capabilities are often interchangeable terms. Capability refers to ‘an organisationally embedded non-transferable firm-specific resource whose purpose is to improve the productivity of the resources possessed by the firm’ (Madadok, 2001, p.389). Extensive studies on strategy management drew forth a variety of views on corporate capabilities. However, a consensus emerged in the literature that competitive advantage pertains to capability, knowledge, and learning in utilisation of resources. Moreover, firms’ abilities to compete are attributed to its capability to identify and develop its core competencies (Guimaraes, Borges-Andrade, Machado and Vargas, 2001, p.250). Based on this literature review, the study holds the view that the meaning of capability can be mainly classified into two types: (1) the relationship among concepts, which is the ‘relationship view’; (2) the reference of the term of capability, which is the ‘reference view’. Specifically, the first type was termed as ‘relationship view’ and the second type was termed as ‘reference view’. Both types of view regard capability as a resource of firm. These views provide insights to understand the essence and features of the concept of core competencies. These insights depicted the relationships and the facets of the concept of capability, and such can be deemed as the solid grounds to understand the building of core competencies.

The ‘relationship view’ means that the discussion of capabilities were about the relationships among related terms such as competencies and abilities, and such discussion was advocated by Madhavarani and Hunt (2008). These views have

different layers. Capabilities or competences are higher-order resources in the sense that they are bundles of basic resources (Madhavaram and Hunt, 2008). Capability refers to a set of competences, which can be utilised for specific objectives (Ray and Ramakrishnan, 2006, p.1). The difference between capabilities and competencies is that capabilities reside in organization routines, practice, activities, and processes of a firm (Hafeez et al., 2002,p.30); while core competencies are the products of collective learning in process of utilisation of resources (Hafeez et al., 2002, p.29). In addition, competencies are usually deemed as the special capabilities, and they are a network of capabilities across the whole organization (Hafeez et al., 2002, p.30). Capabilities refer to the ability to deploy resources to carry out tasks on individual activity basis; competencies are special capabilities, and they are a network of capabilities involving coordination and integration of resources across the organization (Hafeez et al., 2002, p.30). Capabilities that can provide SCA are regarded core competencies, which are also regarded as strategic factors in strategy formulation (Clardy, 2008, p.193 and p. 194). In practice, researchers first distinguished capabilities from competencies because competencies are the sublimated capabilities derived from the integration of capabilities and the utilisation of resources.

The ‘reference view’ means that the term (capability) has its references with specific meanings in it, such as the functions and embodiments that can be found on different facets. For example, capability was addressed on its function as ‘an organisationally embedded non-transferable firm-specific resource whose purpose is to improve the productivity of the resources possessed by the firm’ (Makadok, 2001, p.389). Capability was addressed on its embodiments that ‘capabilities are formed through the coordination and integration of activities and processes, and are the product of collective learning of individual assets’ (Hafeez et al., 2002, p.29). Capability was

also addressed on its features that capability is that the ability a firm can capitalize on repeatedly to conduct business activities effectively and predictably (Smith, 2008, p.47). In addition, capabilities refer to abilities that can be used by the firm to achieve its strategic objectives. Furthermore, capability is a firm's capacity to utilise its resources through organization process to achieve its goals (Amit and Schoemaker, 1993, p.35; Ray and Ramakrishnan, 2006, p.12).

2.3.8 Critiques of RBV

RBV has withstood many criticisms, especially about the VRIO version of RBV; where VRIO is the framework for qualifying resources as sources of competitive advantages. In terms of VRIO, Shafeey and Trott (2014) identified 13 criticisms about RBV from more than 20 scholars (p.135). These criticisms fall into 13 categories: (1) the value conundrum, (2) the uniqueness or rare dilemma, (3) the cognition dilemma, (4) the organization dilemma, (5) the tautology problems, (6) the static problem, (7) the absence of a chain of causality, (8) the asymmetry in assumptions, (9) the accumulation of resources, (10) the synergetic problem, (11) the implementation problem, (12) the epistemological problem, and (13) the framework context problem. (Shafeey and Trott, 2014, pp.132- 41). Shafeey and Trott (2014) named some scholars who criticized RBV, e.g., Sanchez (2008), Priem and Butler (2001 a, b), Armstrong and Shimizu (2007), Levitas and Chi (2002), Madhavaram and Hunt (2008), Dierickx and Cool (1989), and Spender (1994, 1996). Specifically, these criticisms are for different reasons: vague definitions, contradiction with its assumptions, tautology, cognition problems, static views, unsound logics, undistinguishable process (black box), philosophical impossibility, and applicable problems in different contexts (Shafeey and Trott, 2014, pp.132 -134). In addition, these criticisms fall into theoretical, practical, logical, and philosophical problems. Sanchez's (2008) asserted

that RBV is theoretically unwarranted and not possible to be implemented in practice (Shafeey and Trott, 2014, p.135).

Generally, the main criticism is that VRIO fails to provide a practical basis for identifying valuable resources (Shafeey and Trott, 2014, p. 132). It is claimed that the generic attributes of VRIO should not be used to determine whether certain resources are sources of SCA; instead, a firm's capabilities and competences are the real sources of competitive advantage (Shafeey and Trott, 2014, p.143). However, both Sanchez (2008) and Shafeey and Trott (2014) ignored the importance of resources especially the tangible assets in the process of building core competencies. Hafeez et al. (2002) recognized that core competencies should be built and nurtured, but they limited their study to identify core competencies from those existing resources within companies. They did not mention how to build, maintain, or dispose those rigid resources, which were once taken as core competencies. Therefore, they took a retrospective view to look at core competencies that currently possessed by companies; and they overlooked core competencies that may be required to cope with future challenges. Such assertion means that core competencies, which are valid today, may become rigid because of the material and swift changes from the market, the economic and political environment. Therefore, a prospective view to building and nurturing core competencies is justified; companies should look ahead and build their core competencies in advance by empowering top management as a responsible agent to build core competencies. In addition, RBV was also criticised for (1) a firm still remains as a black-box even it has been operating successfully, (2) the causal ambiguity argument still exists (Wilkens et al., 2004, p.9). Accordingly, Wilkens et al (2004) proposed the theoretical concept of knowledge management by combining RBV with organisational theories (p.9) to address these issues.

Despite the above criticisms, RBV, VRIN, and VRIO frameworks of Wernerfelt (1984) and Barney (1991, 2010) are the guiding theories for selecting resources for strategy formulation. RBV, VRIN, and VRIO provide ways of thinking; they do not intend to provide a panacea for all situations because the contexts are not homogeneous and the environment is always changing. First, RBV in the version of VRIO laid out the theoretical foundation, although it was regarded as fragmented initially. VRIO is the starting point for later studies and the development of the theory of RBV. Second, to pursue competitive advantage, a firm should conduct analysis of its resources and capabilities (Shafeey and Trott, 2014, p.144) at the first instance because resources mean potentials of SCA. Third, even some 'black boxes' exist in VRIO, e.g., the causal ambiguity (Priem and Butler, 2001, p.22), some of these could be solved by using financial techniques such as the discounted cash flow (DCF) and the marginal contribution techniques for selecting investment projects. Such techniques can be used to distinguish the differences between using additional resources and the existing resources, and they can be used for selecting strategic resources.

2.4 Main schools of thought of core competencies

This literature review identified different views on core competencies. The principal definition of core competencies is that 'core competencies are the collective learning in the organization, especially how to coordinate diverse production skills and integrate multiple streams of technologies' (Prahalad and Hamel, 1990, p.82). The second definition is that 'If core competence is about harmonizing streams of technology, it is also about the organization of work and the delivery of value' (Prahalad and Hamel, 1990, p.82). Another important definition is that 'core competence is communication, involvement, and a deep commitment to working across organisational boundaries' (Prahalad and Hamel, 1990, p.82). In addition, three

salient schools of thought of core competencies were brought into attention, namely (1) the 'all the resources', (2) the 'one of the resources', and (3) the 'determinant resources' (Aung and Heeler, 2001, p.620). The first school suggests that core competencies include all resources of firm. The second school refers to those core competencies that only include skills and know-how of a firm. The last school defines core competencies as pure skills that are the determinant resources (Aung and Heeler, 2001, p.620 and p.621). The present study adopted the first school of thought, and focused on the interaction among collective learning, process, and resources within the definition of Prahalad and Hamel (1990). As in the context of the research, the view of the first school is considered as appropriate because Case Companies are leading logistics enterprises possessing large amount of heterogeneous resources; while other views are either too narrow or too specific.

2.4.1 Understanding core competencies

Prahalad and Hamel (1990) defined core competencies as the collective learning in utilisation of skills and technologies in organization (Prahalad and Hamel, 1990 p.82). They described core competencies in terms of definition, value, characteristics, and mechanisms. They also deemed core competencies as the metaphor of nutrition and substances of a tree, the glue binding business units, and the engine for new business opportunities (Prahalad and Hamel, 1990, p.82). Generally, a core competence should be a complex integration of technologies and production skills (Prahalad and Hamel, 1990, p.83). Prahalad and Hamel (1990) named four characteristics of core competences. First, core competence is the commitment involved across organization. Second, core competence is enhanced as it is applied and shared. Third, core competence needs to be cultivated and preserved because knowledge diminished if it is not utilised. Fourth, core competencies are embedded in core products or services

(pp.82-83).

Specifically, Prahalad and Hamel (1990) defined core competencies as the collective learning and the capabilities at which a firm excels to coordinate different production skills and integrate various technologies of a firm (Prahalad and Hamel, 1990, p.82). They analogized the value of core competence to a firm as the nutrition and substance to a tree that end products or services are the fruit. Prahalad and Hamel (1990) pointed out that core competencies involve at all levels and all functions of organization. They treated four dimensions of collective learning: coordination of production skills, integration of technologies, organization of work, and delivery of value. In these dimensions, there exist mechanisms, which influence collective learning therefore the core competencies. For example, Prahalad and Hamel (1990) argued that production skills together constitute core competence, which refers to the first dimension of coordination of productions skills (p.82). By analogy, other three dimensions are also mechanisms that generate core competencies. Collectively, core competencies mean that collective learning or abilities in integration of technologies, in organization of work, and in delivery of value.

2.4.2 The decomposition of the concept of core competencies

In order to understand core competence, it is necessary to look at its definitions and analyse the connotations of the concept because a correct understanding of the concept is the premise of correct thinking. The decomposition framework (Figure1) below was developed by drawing on works of Prahalad and Hamel (1990), Rouse and Daellenbach (2002), and Wilkens et al. (2004). It includes specifically the three definitions of core competencies (Prahalad and Hamel, 1990, p.82), the economic framework (Rouse and Daellenbach, 2002, p.966), and the organizational learning

perspective on the generation of core competencies (Wilkens et al., 2004, p. 8). Prahalad and Hamel's (1990) definitions depict the main connotations of the concept including collective learning, coordination, integration, organization, delivery, productive skills, technologies, and value. Rouse and Daellenach (2002) identified key terms in their economic framework including capabilities and core competencies, process, resources, and competitive advantage (p.966). Wilkens et al. (2004) synthesised RBV with theories of organizational learning and knowledge management to analyse the generation of core competencies (p.8).

These three works provide a theoretical foundation for understanding the concept of core competencies because they are under the same umbrella of RBV (Prahalad and Hamel, 1990, p.82; Rouse and Daellenbach, 2002, p.966; Wilkens et al., 2004, p.10). Prahalad and Hamel's (1990) three definitions about core competencies describe the concept from different facets. The first definition states that core competence is about the collective learning in coordination of different productive skills and the integration of diverse technologies within a firm. The second definition suggests that core competence is about the organization of work and the values delivered to customers. The third definition asserts that core competence involves communication, involvement, and commitment across all levels within organization boundaries (Prahalad and Hamel, 1990, p.82). By combining these three definitions, main parts of the definition are emerged; they are property, dimensions, and resources. Where collective learning is apparently the property; coordination, integration, organization, and delivery are the dimensions; and production skills, technologies, work and value are resources. To understand and explain the strategic processes, Rouse and Daellenbach's (2002) proposed an *economic framework* by establishing relationships among key terms including resources, process, capabilities and core competencies,

and competitive advantage (p.966). Wilkens et al. (2004) aimed to explain the essence of core competencies by adopting the organizational learning and knowledge management approach, and they analyse the generation of core competencies with a focus on exploring collective minds (p.8).

Based on the works of Prahalad and Hamel (1990), Rouse and Daellenbach (2002), and Wilkens et al. (2004), collective learning was categorized into property (the essence of core competencies). Coordination, integration, organization, and delivery were classified as dimensions (process); production skills, technologies, work, and value were regarded as the resources. Accordingly, Figure 1 below categorizes these main parts into property, process, and resources. Figure 1 illustrates that the essence of core competencies is collective learning.

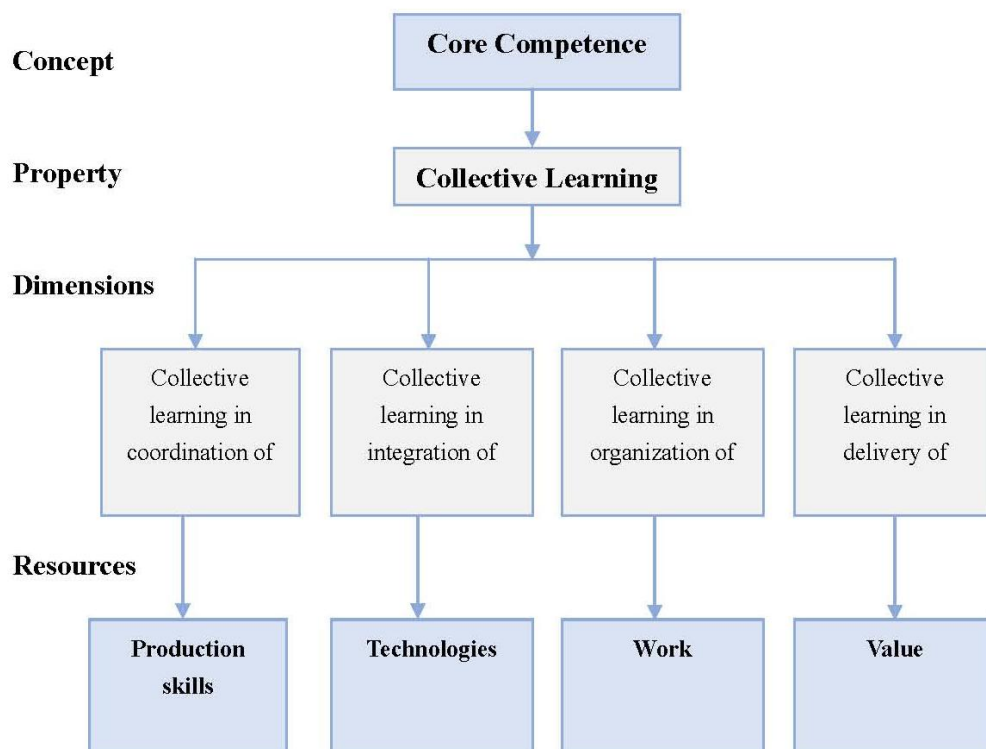


Figure 1: Decomposition framework of core competencies

In Figure 1, the property layer is regarded as capabilities; the dimensions level is

regarded as the process; and the bottom layer is regarded as resources. Figure 1 illustrates that the concept of core competencies has one property, i.e., collective learning and four dimensions: coordination of production skills, integration of technologies, organization of work, and delivery of value (Prahalad and Hamel, 1990, p.82). In addition, it refers to four type of resource: production skills, technologies, works, and value. Figure 1 has five suggestions:

- Collective learning refers to the capability of imitation and creation of knowledge.
- Coordination, integration, organization, and delivery are regarded as processes.
- Skills, technologies, and work are intangible resources.
- Value means the product and its benefits to customers.
- Skills, technologies, work, and value belong to behavioral resources, intangible resources, activity resources, and process resources respectively (Wilkens et al., 2004, p.8).

Production skills, technologies, activities, and processes are all intangible resources, and this classification belongs to the second school of thought regarding core competencies that core competencies only include skills and know-how (Prahalad and Hamel, 1990).

2.4.3 Essence of core competencies

Understanding core competencies means to understand the nature, features, and functions of collective learning in the context of the definition of core competencies. The definition of Prahalad and Hamel (1990) refers to the essence, dimensions, and relationships in terms of capability, process and resources. Where collective learning is the capability; coordination and integration are the processes; and the productions

skills and technologies are the resources. According to the definition of Prahalad and Hamel (1990), collective learning is the essence of core competencies; it is the key to understand core competencies. However, Prahalad and Hamel (1990) did not explicitly define the term of *collective learning*. This flaw made it difficult to understand the concept of core competencies because learning could mean learning capability, learning process, or knowledge.

Understanding collective learning

Thus, it is important to understand collective learning in the first place in order to understand core competencies. According to Capello (1999), collective learning is ‘a social process of cumulative knowledge, based on a set of shared rules and procedures which allow individuals to coordinate their actions in search for problem solutions’ (Capello, 1999, p.354). This definition addressed the nature, patterns, boundaries, functions, purpose, and activity context of collective learning. Where knowledge cumulative process means the nature of the concept of collective learning, and shared rules and procedures mean patterns and boundaries. Coordinating individual’s actions means the function and the activity context, and problem solution means the purpose. When putting this understanding in the definition of core competencies, it depicts that collective learning means as a knowledge accumulating process through coordinating individual’s knowledge within a shared pattern to resolve problems. Accordingly, in the context of the definition of core competencies, collective learning functions to accumulate individual knowledge with shared patterns to solve problems. When the definition of core competencies and the definition of collective learning were synthesized; a new interpretation of core competencies emerged. This interpretation means that core competencies are the knowledge accumulation processes in the courses of coordination and integration of resources (production skills and

technologies) to produce effective and efficient services for production (utilisation of resources). In other words, core competencies are the knowledge accumulation of individual knowledge in the processes of coordination and integration of resources; thus, core competencies are generated. This interpretation, adopting the definition of collective learning of Capello (1990) in the definition of Prahalad and Hamel (1990), serves to explain that causes of the success of a firm. For example, when a firm outperforms competitors in certain products or services; it means that the firm possesses core competencies in that products or services because the firm does better in knowledge accumulation in that domains of products or services. Therefore, collective learning refers to knowledge accumulation in utilisation of resources.

Understanding individual learning

Further, collective learning involves individual learning according to Capello (1990) because collective learning refers to coordination of individual actions in which individual knowledge are embedded. Individual learning was defined as ‘the process in which individuals acquire data, information, skill or knowledge’ (Wang and Chugh, 2014, p.34). However, collective learning does not mean the sum of individual learning; it is synergetic because this effect can be achieved by the mechanism of coordination as claimed in the definition (Capello, 1990) that knowledge accumulation coordinates individual actions. Accordingly, this research holds the view that learning means knowledge accumulation and the process of gaining new knowledge. According to the prior definitions, collective learning can also mean collective knowledge accumulation in organization and integration of firms’ resources (Prahalad and Hamel, 1990, p.82; Fiol and Lyles, 1985, p.811; Teece et al., 1997, p.523). In other words, core competence requires the collective knowledge in the coordination and integration of the resources of a firm. This also implies that such

knowledge is gained by learning ability and through the learning process.

This research holds the view that learning reflects the features of material objects, such as cargo terminals, cargo handling equipment, trucks, or ships. In addition, collective learning should reflect the features of material objects. In this case, learning is a process of thinking that processes the information or the stimuli projected by material objects including resources, especially the tangible assets that embed technologies. Material objects are physically identifiable things in terms of quality, value, time, space, quantity, and size; and the subjects of learning specifically refer to individuals. While the objects of learning exist in physical contexts, the stimuli of the services and features of assets are reflected in the process of learning. Therefore, the types and features of tangible assets would directly influence the learning process.

Learning ability is inherent by individuals, and its difference among individuals is the degree of strength of such ability. Knowledge is gained through the learning processes that bridge observation, obtain new experiences, and integrate new knowledge with existing knowledge. This learning process reorganized the structure of the existing knowledge, and it is a continuing process to enhance knowledge. Accordingly, collective learning embraces collective knowledge gained through the learning process of integrating the new knowledge with the existing knowledge; therefore, it restructures the existing knowledge into new knowledge. According to the definitions of Prahalad and Hamel (1990), collective learning plays the key role in the interaction of knowledge, process, and resources in the mechanism of building core competencies. This understanding of individual learning for collective learning is important because it relates collective learning to other factors (e.g., knowledge, resources, and learning process) in the mechanism of building core competencies, and it helps to explain such

relationships.

2.4.4 Understanding the decomposition framework of core competencies

Previous studies mainly focused on the identification process or discussed largely the building mechanisms of core competencies by descriptions. This review concluded that there had been no attempts about the study of building mechanism of core competencies in a schema form. Thus, it became necessary to adopt a different approach to investigate visually dimensions or themes of core competencies. Based on the definitions of core competencies of Prahalad and Hamel (1990), those dimensions and themes were reorganized and represented in a schematic form; accordingly, a decomposition framework was developed as Figure 1. It suggests that these definitions involve a mechanism of building core competencies as Figure 1 revealed, although Prahalad and Hamel (1990) did not explicitly state this framework. This lack highlights the research gap to develop a framework to explain the reality of building core competencies in the context of Chinese MNPEs.

The decomposition framework (Figure 1) virtually illustrates the relationships among property, process, resources, and capabilities. It has four layers: concept, property, dimensions, and resources. The dimensions and resources were taken from those three definitions, and their relationships were established according to same definitions. Figure 1 depicts that the essence of the concept is collective learning, and the processes are the managerial and operational activities. It also suggests that those dimensions are interrelated because different types of processes may involve different kinds of resources, and any changes in any one dimension may cause changes in collective learning. Figure 1 provides useful guidance for the investigation by identifying key dimensions and depicting relationships among such dimensions. It

helps develop questions for data collection, identify themes and categories, and interpret the results with the theoretical support. As Hafeez et al. (2002) points out that ‘core competencies are usually the results of “collective learning” process and are manifested in business activities and process’ (p.29).

Further, the decomposition framework (Figure 1) depicts that the lower two levels are the processes and resources, and it suggests that the relationship between core competencies and the basis (processes and resources) is reciprocal. Further, it indicated that any changes in the basis would affect core competencies. In turn, changes in core competencies would enhance or improve the selection of factors of the basis. As such, collective learning, the processes, and the resources combined to generate core competencies, forming the foundation for developing competitive strategies. Prahalad and Hamel (1990) posited that changes in resources would influence the building of core competencies (p.83). As such, changes in those resources will ultimately influence the building of core competencies. Accordingly, changes in capabilities and procedures will also influence the building of core competencies. For example, changes in work activities, under the dimension of organization, will lead to changes in collective learning. Changes in procedures of delivering value will also lead to changes in collective learning, thus, changes in core competencies. Therefore, changes in resources or processes could differentiate the organization from others, and contribute to establish a competitive advantage in marketplace. For example, incremental investment in operation systems may enhance a competitive edge in the market because it enables the firm to differentiate from competitors (Prahalad and Hamel, 1990, p.90). Based on the literature on core competencies, the decomposition framework (Figure 1) is a new interpretation of the definition of core competence of Prahalad and Hamel (1990). It was developed to

address the issue of building mechanism of core competencies, and it was used as the lens to look at the research problem, and to investigate the research questions.

2.4.5 Related theories for the decomposition framework

This research integrated relevant theories by drawing on RBV (Wernerfelt, 1984; Barney, 1991; Peteraf, 1993), the organisational learning and knowledge management (Grant, 1996; Spender, 1996; Crossan et al., 1995), and theories of environmental change (Tushman and Anderson, 1986; Ferrone, 2001). Based on the theoretical review, Figure 1 relied on two types of theories, the theories for conceptualization and the theories for establishing relations among relevant concepts. Regarding conceptualization, Figure 1 drew on RBV, core competencies, and dynamic capabilities. Regarding establishing relations among these dimensions, it applied theories and concepts including constructivism, cognition, knowledge, sense-making, collective learning, and the causal relationships. In terms of the research problem, RBV is the most relevant theory for the study because of the nature of the business of the Case Companies.

Accordingly, amid these theoretical boundaries and in the context of global operations, the research adopted the RBV with the focus on the building mechanism of core competencies to address the research questions. Two reasons were considered to adopt the RBV and the focus on core competencies building mechanism as suggested by the literature review. First, Chinese MNPEs possessed huge tangible assets (e.g., heavy plants and equipment), and capital constructions (e.g., terminals and warehouses) at home and abroad. Second, RBV addressed the relationships between resources and SCA, and it suggested that the sources to achieve SCA were derived from resources possessed by firm. Since such huge assets of the five Case Companies

delivered mighty production capacities, the literature review focused on RBV rather than the IO approach of Porter (1985).

The concept of core competencies (Prahalad and Hamel, 1990) relates closely to dynamic capabilities of Teece et al. (1997). Since the 1990s, researchers started to focus on the specifics of how organizations develop firm-specific capabilities and how they renew such competences to respond changes in the business environment. These issues are intimately tied to firm's business processes (mechanisms), market position, and expansion path (Teece et al., 1997, p.515 and p.516) to adapt to rapidly changing environments. The essence of core competence or capability, then, is clearly embedded within the organisational process and routines that provide opportunities to develop a competitive advantage. Teece et al. (1997) pointed out that competitive advantage of firms lies with its managerial and organisational process, shaping its specific asset position, and the paths available to it (p.518). In turn, the organisational processes and routines are influenced by firm's asset positions, and moulded by evolutionary and co-evolutionary paths, thus, explaining the dynamics of capabilities and competitive advantage.

2.4.6 The spectrum of core competencies

The concept of core competencies was addressed from different perspectives. The research identified six views ranging from definition, composition, embodiments, criteria, relationship, and functions. Representative views read as follows:

- **Definition of core competencies**

According to Prahalad and Hamel (1990), the property of core competencies is the collective learning, and the property has two dimensions, the coordination of production skills and the integration of technologies. However, Prahalad and Hamel

(1990) did not define the term of collective learning. The definition of core competencies depicts three things: capability, processes, and resources (Prahalad and Hamel, 1990, p.82). In addition, it was defined that core competence is a mixture built of resources and the dynamic capabilities of an organization (Teece et al., 1997; Eisenhardt and Martin, 2000).

- Composition of core competencies

Core competencies include individual and collective competencies (Nicolai and Dautwiz, 2010, p.876). Core competence is the collection of individual competencies; therefore, core competencies are imprinted characteristics of individual competencies, which include knowledge, skills, abilities, motives, and expertise (Bergenhengouwen, Horn, and Mooijman, 1996). Obviously, individual competencies is regarded as context-dependent and based in the organisational culture, value, vision, mission and values (Bergenhengouwen et al., 1996).

- Embodiments of core competencies

Core competencies are reflected in products or services (Prahalad and Hamel, 1990, p.82). To understand how collective learning effect core competencies; it is important to first understand those dimensions in which it works alongside. Core competencies are rooted in the shared mind-sets, which are built from the organisational culture with characteristics of its values, beliefs, and norms (Chen and Chang, 2010, p.681). Shared minds refer to the uniform way of thinking, perceiving, and valuing both objectives and process to achieve such objectives (Ulrich and Lake, 1990, p.55).

- Criteria of core competencies

A core competence should meet three criteria to create value to customers: (1) core competencies contribute to the value to customers, (2) they are difficult for competitors to imitate the firm's products or services, and (3) such core competencies can be leveraged to diversified operations of a firm (Prahalad and Hamel, 1990, p.83).

& p.84). Barney (1991) proposed that core competence should be VRIN or VRIO. Hamel and Prahalad (1994) argued that whether a resource is a core competence or not is entirely judged by company's customers. Therefore, managers are encouraged to share their understanding of the values of their customers, and deploy competence to satisfy the needs of their customers (Zubac, Hubbard, and Johnson, 2010, p.522).

- Relations with other resources

Core competence acknowledges the complex interaction of human resources, skills and technologies, and it emphasizes the learning and its path-dependency in the development of core competence (Scarborough, 1998 p.229).

- Functions of core competencies

Core competencies are the drivers for firms' operation (Scarborough, 1998, p.229), and they are regarded as critical institutional resources that can be deployed to achieve SCA. The management of a firm can leverage their resources by concentrating on what they do best, and outsource other fringing activities. For example, by concentrating on firm's core competencies and outsourcing other operations, a firm can leverage its core competencies to maximize performance, to establish entry barriers, to utilise external strengths, and to reduce investment risks (Mascarenhas et al., 1998, p.117). Wernerfelt (1984) claimed that a firm owns a stockpile of different resources; and the management should focus on those unique elements of such resources to achieve its SCA.

These diverse views look at core competencies from different perspectives, providing a more complete picture to understand core competencies. Generally, as Prahalad and Hamel (1990) pointed out that core competence drives all company's activities. Core competence is derived from experience without dilution. It requires privilege in investment, and it could be evidenced on technical aspect, commercial arena or

organisational behavior, as a result, it demands commitments and efforts to develop such core competence.

Effects of the six views on core competencies

These six views on core competencies helped understand the concept of core competencies and establish an underpinning for building mechanism of core competencies. The first view is the definition of core competencies of Prahalad and Hamel (1990), and the three key factors are the collective learning, the process, and the resources. This view suggested looking at the building of core competencies from these three paths. The second view argued that core competencies included two levels: individual and collective levels of core competencies. It stressed the importance of the individual competencies and the integration of individual competencies to form collective competencies. It also implied that enhancing individual competencies is a way to build core competencies, and it is possible to achieve through education. The third view suggests that core competencies are embedded in products, services, and mind set of workforce of a firm. This view suggests looking for embodiments to identify core competencies. The fourth view suggests the criteria to determine core competencies. The fifth view pointed out external factors that influence core competencies and their dynamics. The sixth view argues the implications of core competencies in managerial practice. These six views together suggest a holistic view to look at the concept of core competencies from the essences, compositions, embodiments, qualifications, dynamics, and values. In other words, these views provide guidance to understand core competencies in terms of 'what', 'where', 'how', and 'why'. However, this research focused on the mechanism of building core competencies with the reference of the fifth view, which addressed the dynamics of the elements of core competencies and the influencing factors.

Core competencies and the services of operating assets

These six views provided diverse insights about core competencies, and it is obvious that core competencies refer to mainly the intangible aspect of resources in terms of definition and the composition. First, Prahalad and Hamel (1990) deemed that tangible assets are tradable in factor markets, while core competencies are not tradable. This research holds the same view that tangible assets can be acquired from the factor markets, and intangible resources are not easy to be acquired from the factor markets because it concerns capabilities of employees and systems of a firm. In addition, this research holds that production services of tangible assets are important to formulate competitive strategies, not the tangible assets per se. Services of operating assets influence core competencies. This assertion implies that if a firm can secure the required services provided by tangible resources from outside parties; then, the firm may not need to own such assets. Second, Penrose (1959) pointed out ‘exactly the same resource when used for different purposes or in different ways and in combination with different types or amounts of other resources provides a different service or set of services’ (p. 25). Therefore, the effective and efficient utilisation of resources requires management efforts and managerial skills. Accordingly, collective learning and cognitions of the characteristics of services should be aware before specific processes of utilization of resources can be applied; this is why collective learning is the essence of core competencies building.

2.4.7 Origins of core competencies within RBV

Among the milestones of the evolution of RBV, the important development is the concept of core competencies advanced by Prahalad and Hamel (1990) in their paper of ‘The core competence of the corporation’ with its origin in Edith Penrose’s (1959) work. Both Penrose’s (1959) theory of the growth of the firm and Prahalad and

Hamel's (1990) concept of core competence touched upon the notion of sources of competitive advantage (Barney, 1991). Starting from the core competence concept, the present research recalled main theories including 'The growth of the firm' (Penrose, 1959), the RBV (Wernefelt, 1984), and the dynamic capabilities (Teece et al., 1997). These theories and concepts established the main themes of sources for firms to achieve their SCA in marketplace.

2.4.8 The relationships among learning, resources, and the mechanism of building core competencies

The decomposition framework (Figure 1) depicts the reciprocal relationship between learning and resources. Based on the definition of core competencies and the definition of collective learning, Figure 1 was developed to illustrate the function of collective learning and the mechanism of building core competencies. The rationale goes with four assertions. First, tangible assets are the fundamental vehicles to deliver productive services, no matter what kind of activities are involved, either coordination or integration. Second, core competencies are reflected in company's products or services because such competencies are the primitive capability to create such products or services (Prahalad and Hamel 1990, p.81). Third, the relationship between physical assets and collective learning is reciprocal (Foss, 2002, p.153). Fourth, from collective learning to services, two mechanisms are involved: the integration and the coordination processes. This research holds the view that four assumptions support the rationale. First, the productive services of tangible assets are valuable to generate rents, not the tangible assets per se; and only such services are relevant to formulate corporate strategies. Second, the competitive advantage would only be substantiated and perceived by customers in the form of products or services they received. Third, the more the collective learning about tangible assets in terms of utilisation, novelty or

efficiency, the more effective the collective learning will be. Lastly, core competencies building depends on two mechanisms (coordination and integration) in terms of relevancy, effectiveness, and efficiency.

The importance of tangible assets

Collective learning must be aligned with the services delivered by tangible assets. Core competence is the ability to do something effectively and efficiently, and it must relate to tangible assets. Without such tangible assets, ability will not be possible to achieve anything. Thus, the decomposition framework (Figure1) suggests that resources—either owned or controlled by firms—are the fundamental elements relevant to the concept of core competence; without such, operation and production would not be possible. Figure 1 suggests that the quality of tangible assets (in terms of novelty, suitability, and efficiency) is the crucial consideration for selecting the appropriate tangible assets because non-performed or obsolete resources would be very difficult to be coordinated or integrated. The decomposition framework (Figure 1) implies that selecting the appropriate tangible assets is the prerequisite for building core competences. Especially in the logistics industry, where involves huge capital expenditure for facilities including cargo terminal, loading and discharging equipment, and warehouses. Obviously, tangible assets are the objective receptors of learning; and without such receptors, learning would not exit. From the epistemological perspective, learning is a thinking process of input of information and the output of knowledge about certain things understudy. As learning is a process of accumulation and creation of knowledge (Capello, 1999, p.354), it must be aligned with the materialistic objects (such as the tangible assets of a firm). Learning is to understand, explain and gain knowledge about the features of a materialistic object, and it reflects the attributes or features of materialistic objects. For example, in addition to the system of the firm,

employees must be familiar with the tools they use and the techniques to operate them. In addition, employees must have the knowledge concerning the raw materials that are consumed during the production or the process of providing services to customers. That means staff must have knowledge about the features of the services that these tangible assets can provide to the company. Thus, based on this understanding, the present research looked at core competencies through investigating the building mechanism, and the utilisation of resources.

2. 4.9 Learning and the generation of core competencies

Understanding collective learning helps understand the generation of core competencies. Core competencies are built through continuous improvement over time. If a firm failed to maintain its core competencies, the firm will be hindered to enter into new markets (Prahalad, 1990, p.85). Wilkens et al. (2004) pointed out that learning theories are useful to explain the black-box of the generation of core competencies for achieving SCA; as learning theories illustrate critical elements, interactions, and relations for strategy formulation (p.9). Learning is regarded as a resource of a firm under RBV, and knowledge is also the important resource of a firm; these collective minds can resolve the causal ambiguity paradox of RBV (Wilkens et al., 2004, p.9 and p.10). Although, Prahalad and Hamel (1990) did not explicitly state how collective learning could be gained; a general view is that core competence also means knowledge in coordination and integration of resources. Obviously, core competencies are based on the knowledge of resources, and any change of such resources will affect knowledge to be utilised in integration and coordination, thus affecting core competencies. This understanding suggests that by adjusting the portfolio of resources of a firm will subsequently change core competencies. For example, Figure 1 illustrates this point in that collective learning is affected by the

changes in stocks of resources.

From the epistemological perspective, the deeper the knowledge on resources, the more effective and efficient learning will be; thus, such enhanced learning capability enables more effective and efficient coordination and integration. Learning is a process of thinking, and it reflects the characteristics of objects and their relations. The characteristics of resources determined the features of services delivered by such resources; thus, any changes to tangible assets will change the features of services. Eventually, any changes in tangible or intangible resources would affect the learning process, the knowledge on resources, and the ultimately core competencies.

2.4.10 Critiques of core competencies

The critiques about core competencies include narrow dimensions, ignoring functions of tangible assets, and the limitation of contexts. Comparing the arguments of Deist and Winterton (2005, p.28) with the definition of Prahalad and Hamel (1990), Prahalad and Hamel's (1990) definition of core competencies is narrow. As a concept, core competence has one property and two dimensions, and it focuses on skills and technologies and the process of utilisation of resources. This research extended the definition to include four dimensions based on Prahalad and Hamel's (1990) definitions as presented in Figure 1. Accordingly, Prahalad and Hamel's (1990) definition of core competencies narrowed collective learning in four dimensions: coordination, integration, organization, and delivery of value. Obviously, the concept of core competencies was posed in the context of information technology industry; while the present study was carried out in the context of logistics industry. Therefore, the definition of core competencies in the context of logistics industry needs to be studied. Literature revealed that the study of Deist and Winterton (2005) is the good

example in terms of building competencies in different contexts. Deist and Winterton (2005) concluded that it is a challenge to develop a consistent and coherent type of competences because the building approaches are diverse even in a context (p.40). Accordingly, regarding core competencies, a model of typology of competence was proposed. The model is a multi-dimensional framework which includes cognitive competence, functional competence, social competence, and meta-competence (Deist and Winterton, 2005, p. 39). Their study suggested the need to explore the dimensions to suit different contexts. The problem of exclusion of tangible assets by the definition of Prahalad and Hamel (1990) is salient. According to Prahalad and Hamel (1990), core competence is the collective learning in coordination of production skills, integration of technologies, organization of work, and delivery of value as illustrated by Figure 1 wherein the services of tangible assets were excluded. The decomposition framework (Figure 1) shows two main parts: (1) the realization process of collective learning, and (2) the production resources. Generally, collective learning is a capability that is required in operational activities and the utilisation of resources. Where production skills and technologies are regarded intangible resources; work and delivery are deemed as the operating activities. However, the definition did not mention the tangible resources; and this is the significant difference of the view of Penrose (1959), who conceived of the firm in terms of a set of heterogeneous assets including tangible assets. According to Clardy (2008), RBV only considered core competencies as the sources of SCA; but it failed to take into consideration of the role of human resources development in building core competencies (Clardy, 2008, p.183). This exclusion of the role of human resources should be remedied because core competencies reside in firms' internal capabilities, which are ultimately embedded in human resources of a firm (Clardy, 2008, p.183). Clardy (2008) also criticized that RBV emphasized only on assets, but ignoring the issue of developing capabilities

(p.183). The present research accepted that if these two views were synthesized, an alignment could be achieved in both theory and practice in the research context. This thought gave light on the research, and it was adhered to throughout the study.

In addition, core competencies were criticized for limitation in context because the operating context also affects the building of core competencies. The operating context of Case Companies includes its internal and external business environments. The internal environment includes its corporate culture, history, and organisational systems, whereas the external environment refers to the industry players, the economic conditions, and the political and legal systems (Liu and Mckinnon, 2016, p.974). RBV studies should take into account of the development of the context related resources (Liu and Mckinnon, 2016, p.989) because certain contextual factors will influence such studies. These factors include government regulations, business systems, institutions, and local culture (Child, 2008). Accordingly, the analyses on these Case Companies should take into consideration of the context wherein these Case Companies operate.

This research views that the dimension of the definition of core competencies by Prahalad and Hamel (1990) is limited for generalisation. Further, one distinct feature of core competencies is causal ambiguity that the nature of the components and their interplay are invisible, and complicated to understand and implement. The possible reason of the limitations may be attributed to the fact that the context, where the study by Prahalad and Hamel (1990) was conducted, is in IT industry. As such, Prahalad and Hamel (1990) hold the second school of thought of core competencies that they only included skills and know-how of a firm (Aung and Heeler, 2001, p.620-621) in IT industry context.

This research views that the virtue of the concept of core competencies is that it leads to consider firms' own core competencies. In fact, Prahalad and Hamel (1990) hold the view that global competitive strategies should include considerations of multiple business and geographical regions (Manikutty, 2010, p.2). For this research, the criticisms on core competencies suggested remedies for taking considerations of expanding dimensions, recognising the importance of tangible assets, understanding collective learning, and focusing on the operating contexts of the Cases Companies.

2.4.11 The managerial obligation for building core competencies

The senior management team of a firm is responsible for building core competencies and formulating company's strategies to maintain competitive advantage. Yet, this task is challenging because it is technically difficult; it demands high quality and abilities of the top management team, and the management commitment. First, Prahalad and Hamel (1990) pointed out that the merits of competencies depend on the degree of their circulation and on the size of the resources base. Second, they argued that top management of companies required the capability to mingle the technological and productions skills to competencies, and respond quickly to challenges or opportunities. Third, core competencies building require managerial commitment and resources. These difficulties and prerequisites feature this arduous task of building core competencies.

Literature suggests solutions to these difficulties and prerequisites in terms of building approaches, testing criteria, and the authorities to build competencies. First, core competencies are built from firms' collective learning through the processes of coordination and integration of firms' resources (Prahalad and Hamel, 1990, p.81). Second, core competences must be subject to VRIN or VRIO tests to be sources of

competitive advantage (Barney, 1991, pp.105-107). Third, under ‘Company Articles’ and laws, the management team is legitimate to build and maintain core competencies, and in practice, they are obliged to discharge such duties.

Features of building core competencies

The salient feature of building core competencies is the commitment of the top management team of a firm because of the importance of building core competencies. Such importance is obvious as they are the basis for formulating corporate strategies and the sources for achieving SCA. However, core competencies are not built in a day. A firm should define, create, and maintain its core competencies in a continuing way because SCA does not last forever; and it takes time to build core competencies (Barney 1991, p.102 & p. 103). Accordingly, managerial commitments are imperative, as Prahalad and Hamel (1990) stated the following:

Core competencies are built through a process of continuous improvement and enhancement that may span a decade or longer, and a company that has failed to invest in core competence building will find it very difficult to enter into an emerging market (Prahalad and Hamel, 1990, p.85).

The second feature of building core competencies is that companies should build and nurture competencies for achieving SCA because core capabilities may not sustain forever. Core competencies may become rigid due to changes of market conditions or technological breakthrough (Leonard-Barton, 1992). However, building core competencies is sophisticated, as Prahalad and Hamel (1990) stated that building core competencies is more ambitious and different than mustering resources vertically. They also pointed out that corporations are unlikely to maintain global leadership in more than five or six core competencies (Prahalad and Hamel, 1990, p.84). Further, according to Prahalad and Hamel (1990), building core competencies involves collective learning, processes, and resources including technologies; but all these

areas are not easy to understand. Thus, understanding a firm's core competencies is essential to formulate corporate competitive strategies (Mascarenhas et al., 1998, p.117).

Since a firm's management is responsible for building and maintaining core competencies, its managerial competence becomes a matter of concern. The premise is that the management should have the knowledge and learning capability about firm's resources; otherwise, it will be impossible to build core competencies. As Karim and Mitchell (2000) pointed out that learning and knowledge enrichment are characterized by path-dependent traits (p.1068), and knowledge comprises of information and know-how (Kogut and Zander, 1992). This know-how means the expertise gained, and it enables staff to accomplish tasks effectively and efficiently. It is the lack in these skills and expertise, which may limit managerial competence to perceive strategic alternatives (Karim and Mitchell, 2000, p.1068). Hence, managerial competence becomes a critical factor in building core competencies. To avoid this dilemma, the management team needs to deepen their knowledge about their firms' resources, as this learning process would enable the team to better deploy and utilise firms' resources for building core competencies (Foss, 2002, p.153).

Ways to maintaining core competencies

Within RBV, the literature review identified two ways to maintain core competencies: (1) amassment of resources, and (2) innovation in firms' resources. First, amassment of resources is a way to maintain core competencies to respond to environment challenges. Factors that may affect changes in a firm's resources include strategies change, investment in major tangible assets, M & A, business opportunities, economic fluctuations, innovation and advancement of technologies, and financial distress.

Therefore, in order to maintain a desirable resources profile, firms should use an acquisition mechanism to accumulate required assets to build core competencies. In the case of a merger transaction, which is a critical event for the building of core competencies, the underlying reason is usually to improve productivity, or enhance marketing activities (Clark, Gioia, Khen, and Thomas, 2010, p.401). Further, acquiring either tangible or intangible resources also helps achieve synergy and financial or tax advantages. However, cultivating core competencies does not mean excessive investments on R & D or tangible assets. Therefore, building core competence refers to a managerial process to create and nurture core competencies mainly in three aspects, the mechanism, strategies, and paths.

The second way to build core competencies is innovation because core competencies may become rigid if firms refuse to make changes to respond to the changing environment, or firms rely too much on path-dependency. One solution is to reconfigure firms' resources through the mechanism of acquisition, which is inevitably influenced by path-dependency. Another solution is to adopt the path-dependency or path-breaking approach to change resources. Where the path-dependent approach insists in existing resources deepening, path-breaking change means acquiring and utilising resources for diverse business extensions (Karim and Mitchell, 2000, p.1066). A firm's existing position was established by its historical path (Teece et al., 1997, p.522), and a firm's growth relied on a constant balanced of stocks of the firms' resources (Penrose, 1959, p.85). The direction of firm's advancement is a function of its present position of resources and its strategic path ahead (Teece et al., 1997, p.522). In other words, the impact of path-dependency to a firm means that where the firm can go depends on its existing position and the future path. The existing position of a firm's assets depends on the historical path,

which is called ‘history matters’ (Penrose, 1959, p.xiii). The organisational past experience and learning process moderates the positions and the paths of a firm (Teece et al., 1997, p.524). The organisational capability to learn is subject to what have been known (Cohen and Levinthal, 1990), and path-dependency routines determined firms’ investment. This characteristic of path-dependency changes affects the investment and expansion of a firm, as well as the collective learning of the firm.

2.4.12 Nature of the mechanism of building core competencies

The review concluded that few studies have investigated the mechanism of building core competencies. Grant (1996) identified two types of mechanisms for integrating knowledge: the direction mechanism and the organisational routines (p.379). Direction mechanisms are documented and formally formulated for long-term purposes, e.g., the mechanisms for capital expenditures for strategic M & A, and investment. These mechanisms are rigid and not frequently changeable because the procedures, criteria, and principles are fixed. Yet, organisational routines mainly refer to managerial activities in reorganization and integration of resources; they are flexible and technical usually adopted for short to mid-term purpose. They do not affect the fundamental composition of the resources especially the tangible assets. These descriptions by Grant (1996) explain the nature of the mechanism. Mechanisms either documented or undocumented are related to firm’s decision making, e.g., acquisition of critical tangible assets is a mechanism, which affects the success or failure of a firm. Another definition is useful to understanding the nature of the mechanism for building competencies:

Any process by which a firm qualitatively changes its existing stock of assets and capabilities, or creates new abilities to coordinate and deploy new or existing assets and capabilities in ways that help the firm achieve its goals; competence building also involves the creation of new strategic options (Sanchez et al., 1996,

quoted in Meschi and Cremer, 1999, p.43).

This definition explains the relationship between the allocation of resources and wealth creation, and it mentions resources, process, objectives, and strategic options as the components of the mechanism. However, the changes of existing resources and assets are subject to two factors: critical events and path-dependency. Critical events imply the occurrences that trigger changes in resources stock, and usually relates to the change of strategic decisions. In addition, path-dependency refers to ways that companies follow to acquire, dispose or reorganize their asset portfolio; and it refers to the pattern shaped by the changes of chronological events in investments or changes of resources on business cycle. This path-dependency consideration recognized the influences of historical experience and practice of the management team in current or future decisions on the building of core competencies, especially on firms' tangible assets. Therefore, history in investment matters, which may determine the direction of future investment activities.

In the context of rapid technological change, Teece et al. (1997) advocated the dynamic capabilities approach. They considered that the competitive advantage of companies was determined by two factors: (1) the mechanisms including the coordination and combination of specific assets such as the knowledge assets; and (2) the pathological dependence in development (Teece et al., 1997). Apparently, Teece et al. (1997) hold the same view on core competencies as Prahalad and Hamel (1990) who defined core competencies to be the collective learning in the coordination of skills and integration of technologies. In other words, Teece et al. (1997) also considered that coordination and integration are processes, which can be deemed as mechanisms.

2.4.13 Antecedent studies on core competencies

Since the '90s, there has been a surge of research emphasizing on the need to build core competencies in order to achieve SCA. Many studies have been conducted on core competencies from different perspectives, in a variety of contexts, for various purposes, and by using diverse methodologies. However, most studies were conducted from the aspect of intangible resources, in the context of manufacturing or services industry, for identifying competencies, and by using qualitative research approaches. In terms of the mechanism of building core competencies, no studies have been reported in the context of Chinese MNPEs.

In terms of the methodology of building core competencies, Mascarenhas, Baveja and Jamil (1998) conducted a study on 12 world leading companies including Boeing, Siemens, and Citicorp to investigate how these mighty firms built their core competencies. They found that these companies did not just keep their core competencies, but also reshaped their capabilities in order to cope with the changing environment. One of the methods these giants employed was to concentrate on the competencies with which these companies could do their best, and to outsource other activities. By doing so, companies were able to reduce investment risks and be flexible to acquire other capabilities from outside when they need. Competition is ever changing and quick; therefore, the advantage achieved by the firms was considered temporary.

Huang et al. (2019) proposed a model of building core competencies based on an innovation ecosystem in China high-speed railway industry. Huang et al. (2019) suggested that core competencies (in terms of technology) evolved from the accumulation period, the introduction period, the independent innovation period, and

the integrating innovation period, all of which were along firms 'growth path' (p.846). They claimed that this is the pathway to achieve technology innovation and core technologies, therefore, to achieve core competencies (Huang et al., 2019, p.843). However, the definitions of ecosystem vary in literature, e.g., digital innovations ecosystems, hub ecosystems, open innovation ecosystem, and platform based ecosystem (Gawer and Cusumano, 2014). According to Huang et al. (2019) '...the innovation ecosystem is a network of interconnected organizations, connected to a focal firm or a platform that incorporates both producer and user, as well as creating and appropriating value through innovation' (p.844). 'The interdependency and dynamic co-evolutions are the two important features of an innovation ecosystem' (Huang et al., 2019, p.844).

Hafeez et al. (2002) proposed a theoretical framework to identify core competencies (p. 28). The framework consists of three stages: (1) the recognition of key capabilities, (2) the identification of competence, and (3) the determination of core competencies (Hafeez et al., 2002, p.31). The criteria of key capabilities are those perceived as the operational strengths that had helped the company to realize high profit margin indicated by performance indicators, such as the net profits margin, ROA, ROE or the balance scorecard method. Two core competencies (promotion and customer services) of the subject under study were identified in the study (Hafeez et al., 2002, p.34). The identification starts with stage 1, which screened the strengths in different functions of the company as the capabilities by using several performance indicators such as the operation performance, financial position, and nonfinancial indicators. Operational performance indicators include return on capital, sales growth, operation margin, market share, and new product introduction indicators. Those qualified strengths were deemed as the capabilities of the firm. At stage 2 for identification of competencies,

those capabilities were assessed by the degree of integration and collectiveness using a four-point scale to measure whether such capabilities are integrated across-functions, among business, and covering products or services of the firm. Those items with higher scores were considered as the competencies. At stage 3 for determining core competencies, capabilities were assessed in terms of strategic flexibilities from two aspects: the resource redeployment and routines reorganization. Hafeez et al. (2002) provided a valuable mechanism to identify core competencies based on findings from their empirical study. According to Hafeez et al. (2002), capabilities were judged by their attributes such as performance, and competences are assessed by the degree of integration of capabilities. Further, competencies were determined by the extent of strategic flexibility of use. Hafeez et al. (2002) provided a managerial tool to identify core competencies; however, they did not stress the issue of how firms build their core competencies.

Meschi and Cremer's (1999) case study on a French company, Spie-Trindel, which employed about 3,000 staff with an annual sale of Frs. 5 billion in 1992, showed that the company encountered substantial loss in sales and fell into financial distress. To overcome the difficulties, the company launched a corporate renewal program in 1993, where they conducted a program to establish a legitimate linkage between the process of core competence building and their strategic objectives for company revival. They took the process as a tool to reacquaint and reshape their core competencies. Meschi and Cremer (1999) found that the major problem of the company was the organisational malfunctions, and the declines of sales were originated from disharmonised utilisation of and coordination of existing core competencies. In the process of building core competencies, the company adopted its own definition and stipulated it in internal documents of the firm in 1994. It says, 'Core competence

forms the heart of the business of the Company, its formation results from collective experience. It presents across all functions of the organization, and it requests firm's commitment for priority investment' (Meschi and Cremer, 1999, p.43). This definition stressed the collective experiences, but not the collective learning; however, it has similarities at different degree in other aspects with Prahalad and Hamel's (1990) definition. The result of the program was a consensus of profiles of core competencies, which were proximity of commercial presence, mastery of electrical networks, ability to conduct complex projects, ability to understand, exploiting process, and maintenance. These core competencies allowed the company to formulate their competition strategies and the company regained revitalization in 1995. The study revealed how a French firm recovered by adopting the strategy of core competence building.

A research on the similar topic of the mechanism of building core competence was conducted by Lan et al. (2020). The research problem is about the construction mechanism of the core competence of Chinese enterprises. They applied the methodology of theoretical deduction and speculation (Lan et al., 2020, p.69). They developed the construction mechanism of core competence, which includes four parts, process mode, knowledge source, management mode, and the key success factors (Lan et al, 2020, p.69). Although the topic seems similar with the present study, their research was conducted differently through theoretical deduction and speculation (Lan et al., 2020, p.69), which is not comparable with the present study.

Based on other studies with similar topics, this research found that most of the empirical studies on core competencies were conducted on the aspect of identifying core competencies by using qualitative research approaches. Specifically, these

studies were conducted in manufacturing and services industry, but not in Chinese port industry. Although Lan et al. (2020) proposed a construction mechanism of core competencies for Chinese enterprises, they conducted the study by theoretical deduction and speculation, which is not an empirical study (Lan et al., 2020, p.69). By addressing these gaps both in literature and practice, the literature review suggests that a conceptual framework would help understand and explain the mechanism of building core competence, and it would help practitioners identify paths to examine and build core competencies.

2.5 Research gaps

The fundamental question of strategy management is how companies achieve their SCA. Since core competencies are the sources for achieving SCA (Barney, 1991), the importance of building core competencies is obvious as scholars addressed the issue on many occasions. Prahalad and Hamel (1990) pointed out ‘Top management must add value by enunciating the strategic architecture that guides the competence acquisition process. We believe an obsession with competence building will characterize the global winners of the 1990s’ (p.91). Prahalad and Hamel (1990) emphasized that ‘Building core competencies is more ambitious and different than integrating vertically moreover’ (p.83). ‘The battle to build world-class competencies is invisible to people who aren’t deliberately looking for it’ (Prahalad and Hamel, 1990, p.83). Thus, the immediate question is what mechanism that firms can use to build their core competencies. However, the issue of the mechanism of building core competencies has been overlooked by literature, especially in the context of the Chinese MNPEs.

Over the past three decades, the study of core competencies has been growing

vigorously; and many theories have emerged. However, this literature review found that few studies had been conducted on the topic of building mechanisms of core competencies in the context of the Chinese MNPEs in global logistics industry. In this context, the tangible operating assets of the Case Companies are capital intensive, and such types of assets can not be ignored, as they are the foundations for production or services. Mahoney (2005) argued that firms could create industry barriers to protect their competitive advantage; therefore, huge capital expenditure on investments of tangible assets means high industrial entry hurdles. These arguments are justified, but there is a missing part of how to build core competencies based on such huge amount of tangible assets. In addition, this literature review identified three main development trends of core competencies (e.g., the identification, building, and leveraging of core competencies), but few studies on mechanisms of building core competencies. Regarding the building of core competencies, however, RBV has neglected the actual process of coordinating and deploying resources to alternative utilisation (Foss, 2002, p.158). Accordingly, gaps were identified in both theories and empirical studies in the context of Chinese MNPEs. For example, few studies were found to address the issue of *how* Chinese firms establish their core competencies in terms of building mechanism, paths, and critical events in the context. Therefore, in terms of theories and empirical studies on building mechanisms of core competencies, gaps were identified in the aspects of theories, empirical studies, subjects, context, geographical locations, and tangible resources.

The main finding of the literature review is the lack in theory of mechanisms of building core competencies in the context of Chinese MNPEs. Such building mechanisms act like mediators that link operating assets with capabilities to generate core competencies. Specifically, no relevant studies on the mechanisms of building

core competencies were identified to explain *how* Chinese MNPEs achieved their competitive advantages in a schema form, and *in what ways* they secured their market positions. Within this context, these gaps deserve investigation because of their theoretical significance and managerial application.

Beginning from the origin of RBV by Penrose (1959), the evolution of the concept of core competencies (Prahalad and Hamel, 1990) has been examined. The milestones include the RBV by Wernerfelt (1984), core competencies by Prahalad and Hamel (1990), VIRN, VIRO, and SCA by Barney (1991; 2010), knowledge-based view by Grant (1996), organisational learning (Crossan et al., 1995), and dynamic capabilities by Teece et al., (1997). Some other important current studies on core competencies and competitive advantages include research on the aspects of the DNA of firm and innovation (Silva et al., 2014; Chatenier et al, 2010; Ramdani et al, 2016). This literature search reviewed the IO approach and RBV to strategy management and their critiques; and it articulated their main features and relations. In the review, the research noticed the close relationship between human resources and material resources (Penrose, 1959, p.76) that together generate the productive services to companies, and such services are the basis for formulating strategies for competitive advantage. The review also discussed three main trends in the study of RBV by elaborating on the evolution of RBV. In addition, the review examined the three schools of thought of core competencies. Finally, it developed the decomposition framework (Figure 1) that depicts the relations among various elements in the process of building core competencies according to the definitions of core competencies by Prahalad and Hamel (1990). Practically, the decomposition framework (Figure 1) serves as a solid guide for the study. In addition, based on the findings of the literature review, the research adopted the qualitative research design by employing the

multiple-case study approach. As a result, the literature review spotlights a specific area in the knowledge of building core competencies in the context of Chinese MNPEs and the utilisation of tangible assets in operations

Chapter 3 Methodology

This research adopted the constructivism paradigm (Morgan and Smircich, 1980; Denzin and Lincoln, 2012), the multiple-case study design (Yin, 2003, 2018), and the 5-R research approach (Yu, 2018). The research paradigm consists of four philosophical perspectives: (1) constructivism for ontology, (2) interpretivism for epistemology, (3) pragmatism for axiology, (4) qualitative approaches for methodology. The multiple-case study approach was employed as the overarching research design, and the 5-R approach was taken as the main tasks to be performed. In addition, the research adhered to three specific guidelines: (1) collecting multiple sources of evidence that may converge on the same categories of facts or results, (2) utilising a database for retaining data and analysis, (3) establishing logical inference from research questions, supporting evidence, and conclusions (Yin, 2018, pp.126-136). These principles were applied throughout the research.

The research design consisted of five holistic single-cases of Chinese MNPES and three holistic single-cases of industry associations in China. The design aims to connect the empirical data to research questions for conclusions (Yin, 2018, p.4), and it followed the replication logic where individual case studies may produce similar results or contrasting results (Yin, 2018, p.55). The research consisted of three phases: (1) research design, (2) administration of the design, (3) formulation of conclusions (Yin, 2018, p.58). The 5-R approach suggests five key tasks to be performed in the investigation, i.e., recollect, research, review, reflect, and realise. The researcher collected secondary data from the Case Companies' websites and the primary data through in-depth interviews with senior executives of Case Companies. A total of 23 annual reports and 11 interview transcripts were collected, and all data were organized and presented in text format for analysis.

3. 1 Research design

With the relativism perspective, this qualitative research adopted the multiple-case study design. The research methods include conceptual framework, content analysis, text analysis, thematic analysis, and triangulation; and the emic stance was also adopted (Morgan and Smircich, 1980, pp.494-495; Mayer, 2015, p.54). Data gathered includes company annual reports, recordings from in-depth interviews, and the verbatim transcripts of such recordings. In data collection process, outlines were used for desk-based research, and a protocol and an interview questionnaire were used for data collection from in-depth interviews. Three methods were employed for data analysis: individual case analysis, cross-case comparisons, and thematic analysis. The last method was specifically used throughout the data analysis process (Clark, Gioia, Khen, and Thomas, 2010; Gioia, Thomas, Clark, and Chittipeddi, 1994). The research guidelines of Clark et al. (2010) and Gioia et al (1994) were followed for data analysis and presentation. In the process, the analytical framework method (analytical tree) was used to develop main themes of the data, and findings were generated from the results of such data analyses. Five Chinese leading MNPEs and three industry associations (for triangulation purpose) were purposively selected as the Case Companies. They are the national leading logistics enterprises located in Guangdong, Hong Kong, and southern China.

Philosophical grounds

Based on the purposes of the study, the research problem, and the research questions, this study adopts the qualitative approach for three reasons. First, the reality of the research problem is considered constructive. Social constructivism holds the view that reality is socially constructed, i.e., the phenomena of the social and cultural world and their meanings are created in human social interaction (Robson, 2011, p.533). Second,

qualitative research tends to create new concepts and emphasize constructing theoretical interpretations. Third, various research traditions and methods are applicable to facilitate the research. Morgan and Smircich (1980) propose a subjective-objective continuum, along which they present different philosophical stances, in terms of assumptions on reality, on five philosophical perspectives. These stances are under philosophical perspectives of ontology, human nature, epistemology, metaphor, and research methods. These philosophical stances are categorized into six paradigms, i.e., imagination, construction, symbolic discourse, contextual field, concrete process, and concrete structure (p.492). Lincoln et al. (2012) present a similar framework consisting of five research paradigms including positivism, post-positivism, critical theory, constructivism, and participation (p.156). Largely, these two frameworks present similar types of research paradigms along the continuum of subjective-objective continuum or between relativism and positivism. Accordingly, this study adopted the constructivism research paradigm, which suggests understanding the reality through hermeneutics.

The paradigm holds various stances under philosophical perspectives of ontology, epistemology, methodology, and other themes including human nature, metaphor, research purpose, and the nature of knowledge (Morgan and Smircich, 1980, p.492; Lincoln et al., 2012, pp.158-71). Specifically, for ontology, it assumes that reality is a social construction; for epistemology, it assumes that reality is the outcome of interaction between researcher and the subject, and it is influenced by existing experiences and knowledge. For methodology, the paradigm suggests hermeneutical methods including interview, observation, and text analysis (Morgan and Smircich, 1980, p.492; Lincoln et al., 2012, pp.158-71). This research paradigm provides useful philosophical assumptions and stance from different philosophical perspectives, as

well as principles, and methods to conduct the research.

According to the research paradigm, the study adopted the multiple-case study (Yin, 2003, 2108) and 5-R (Yu, 2018) as the research approaches in research design. These approaches allow applying flexible methods for data collection, data analysis, and interpretation of findings, as well as providing guidance for research activities at different stages of the study. The paradigm suggests understand and reflect the reality through interaction with Case Companies and interviewees; accordingly, the research employed desk-based research, and in-depth interviews to gather secondary and primary data from Case Companies. The research applied hermeneutical methods and techniques for data analysis, which include text analysis, thematic coding analysis, and cross-case comparisons. For interpreting findings, the research kept awareness of issues of reflexivity, validity, and reliability since the research paradigm is of social interaction nature. Accordingly, the research adopted measures including triangulation in data gathering and analysis, and application of theories (Yin, 2018, p.128).

3.2 Objectives of the research design

The research design aims to establish (1) practical definitions of key issues being studied with references from relevant theories, (2) causal relations among factors to address the research issues, (3) the domains where the findings of the study can be used, (4) demonstration that the same findings can be obtained when using the same methodology (Yin, 2003, p.34). Specifically, the research design made decisions on the choice of the philosophical assumptions, research principles, research approaches and methods. It followed the examples of the research design and the procedures of conducting inductive cases study suggested by Eisenhardt (1989, p.533 & p.535). Accordingly, the research design included selection of case companies and

administration of the research plans for data gathering and analysis. Throughout the data collection and analysis processes, inductive logic principles were taken as the guidelines. In addition, the constructivism paradigm was adhered to during the research. Moreover, issues of validity, reliability, and ethics were addressed in the design. Instruments and devices for data collection and analysis were developed and used.

3.3 Research approaches

The research adopted two approaches, the multiple-case study (Yin, 2018) and 5-R research approach (Yu, 2018). These two approaches were employed in all eight cases. As the comprehensive research strategy, the multiple-case approach (Yin, 2003, p.14) has five distinctive applications. This strategy serves (1) to explain the causal relationship in a phenomenon in real-life, (2) to describe the interaction of related elements within a mechanism, (3) to illustrate the rationale of principles, (4) to explore insights and understanding of phenomenon under study, and (5) to evaluate studies that have been done (Yin, 2003, p.15). The strategy followed a set of prespecified procedures, which included the research design, preparing for data collection, analyzing evidence, and reporting the results (Yin, 2003, p.21). In addition, the 5-R research approach helps to keep the research on track what exactly should be done in each phase of the research.

3.3.1 Research methods

The tasks of multiple-case study included examination, categorization, tabulation, testing evidence, and addressing the initial proposition of the study (Yin 2003, p.109, p.113). The approach employed three specific analytical methods suggested by Yin (2003). The pattern matching technique was used in individual case analysis; and the

explanatory building and cross-case synthesis techniques (Yin, 2018, p.286) were used in cross-case analysis (Yin 2003, p. 109). The reasons to adopt these approach and the methods include (1) they captured the features of the individual cases and the cross-cases analysis, (2) they established a solid base to explain a phenomenon. Specifically, the pattern matching analysis helps lay a reliable foundation for conclusions of the case study, and the explanatory building method helps develop theories. In addition, the cross-case synthesis method was used for cross-case analysis. These three methods were used jointly or severally in research, and they were used to aggregate findings across a series of individual studies (Yin, 2003, p.116). The multiple-case study strategy enabled the investigator to conduct inquiry to phenomena in real-life context, and the in-depth interview provided the investigator with opportunities to communicate directly with participants in settings where vivid data can be obtained during the interactions. In addition, thematic analysis (coding analysis) was also applied. Guided by the 5-R research approach, the research was conducted in six steps: (1) searching data about the Case Companies, (2) preparing documentation, e.g., designing the interview protocol, the interview questions, and the ethical letters, (3) deciding setting and timing for interviews, (4) conducting in-depth interviews, (5) preparing transcripts and analyzing data, (6) interpreting and reporting findings.

3.3.2 Reasons for adopting the research approaches

Further reasons to adopt these two research approaches (multiple-case study and 5-R research approach) are evaluated in term of the philosophical paradigm adopted, which includes constructivism for ontology, interpretivism for epistemology, pragmatism for axiology, and qualitative approaches for methodology. Literature review suggests adopting qualitative research approaches to conduct this study. In terms of ontology, six reasons were considered to choose these approaches. First, the

main research question of how Chinese MNPEs build their core competencies is a social reality where the answers to the problem was collectively constructed and communicated between the interviewee and the researcher. This was based on the philosophical assumption of constructivism and interpretivism. Second, the data collected from the desk-based research provided authentic information about these Case Companies. Third, the in-depth interviews provided opportunities to communicate directly with interviewees. Fourth, the aim is appropriate and practical to gather both the secondary data and the primary data through these two collection methods. Fifth, these approaches formed triangulation in data and analyses aiming trustworthiness of the study in terms of validity, reliability and ethnical compliances. Sixth, these approaches provide useful guidance for developing explanations to the reality under study.

In terms of epistemology, two reasons were considered to utilise these approaches. First, the study was based on the constructivism paradigm, which guided the researcher to evaluate methods of data collection and analysis. Based on the multiple-case study design, empirical data were collected and analysed to understand what core competencies these Case Companies possess, and how these firms build their core competencies. Second, data from in-depth interviews were documented, and such documents were solid and authentic evidence to prove events.

In terms of axiology, two reasons were considered for adopting these approaches. First, these approaches are complementary and can be used to serve the purpose of developing a theoretical explanation to the research problem. Second, using triangular approaches (in terms of multiple-case study) can enhance trustworthiness of the study. The multiple-case study approach helps determine boundaries of cases by specific

parameters such as place and time (Creswell, 2013, p.98).

In terms of methodology, four reasons were considered to adopt these approaches. First, the study was an empirical inquiry to investigate a practical problem in real-life context. Second, these two approaches were appropriate to illuminate an entity's decision or set of decisions to answer how these decisions were implemented and with what consequences. Third, these approaches were fit to the investigation to obtain answers to 'what', 'how' and 'why' questions. Fourth, these approaches enabled the researcher clearly identify cases with boundaries and seek to deep understanding of the Cases Companies.

3.4 Selection of Case Companies

The Case Companies were purposively selected because they have similar operating assets, management style, and operations. Despite of the similarities, they occupied different geographical locations and dominated different business dimensions. Key considerations for the selection include ownership, business nature, assets types, positions in the market, securities listing status, and the roles played in the development of China's national economy. Candidates, who satisfied these conditions, are appropriate for cross-case comparisons. Moreover, the researcher has more than 25 years' working experiences in the industry; this professional background helped efficiently identify appropriate types and sources of data for collection. Furthermore, the researcher has personal connections with top executives working with these Case Companies; and this convenience made it possible to conduct in-depth interviews. In the research, these Case Companies are anonymous; and their identities were replaced with codes of Case 1, Case 2, Case 3, Case 4, Case 5, Case 6, Case 7, and Case 8, respectively.

3.4.1 Business of Case Companies

The Case Companies own and operate key cargo terminals, container yards, warehouses, frame cranes and gears, and land transportation vehicles. Because of China's economic system, SOEs enjoy privileges to use precious natural resources such as the deep-water harbor and cargo terminals along the national coastline of China. SOEs also enjoy stronger bargaining power in capital financing deals because of the high quality of collateral tangible assets. Cargo terminals, warehouses, and container depots are regarded as strategic assets, and they are rare resources. These tangible assets underpin SCA of Case Companies, and they matter the longevity of these firms. The operation and management activities of Case Companies are strictly supervised by government regulators and industry supervision institutions because they are listed companies. A summary of the business profiles of the Case Companies are shown in Table 1 below.

Table 1 Summary of business profiles of Case Companies (2019)

Case	Business profile
Case 1	
Incorporation:	SOE reorganized in 2016, listed in Hong Kong Supervised by the Chinese central government
Principal business:	Operating and managing cargo terminals worldwide
Key assets:	Cargo terminals and warehouses worldwide
Operating performance:	Container throughput: 134 million TEUs in 2019
Industry position:	'A leading ports operator in the world.' 'Its parent company is the largest integrated shipping enterprise in the world.'
Case 2	
Incorporation:	SOE reorganized in 2018, listed in Hong Kong Supervised by the Chinese central government
Principal business:	Operating and managing port assets worldwide
Key assets:	Terminals and warehouses worldwide
Operating performance:	Container throughput: 111 million TEUs in 2019
Industry position:	'A global leading port developer, investor and operator, with a comprehensive ports network at the hub locations

	worldwide’
Case 3	
Incorporation:	SOE founded in 1962 and listed in Hong Kong, Supervised by a Chinese provincial government
Principal business:	Operating and managing river cargo terminals and passenger ports in Hong Kong, Guangdong, China, and countries in South East Asia
Key assets:	River terminals, warehouses, fleet of high-speed passenger ferries for international operation
Operating performance:	Container throughput: 1.2 million TEUs; Break bulk cargo: 8.0 million tons; Passenger traffic: 4.3 million in 2019
Industry position:	One of the largest local river port operators One of the leading waterway passenger transportation operators China
Case 4	
Incorporation:	SOE reorganized in 2016, listed in China Supervised by a Chinese municipal government
Principal business:	Operating and managing domestic cargo terminals
Key assets:	Terminals and warehouses
Operating performance:	Container throughput: 20.7 million TEUs Total cargo throughput: 493 million tons (including containerized cargos) in 2019
Industry position:	‘World-class port, Worldwide service’ Ranked No.5 in terms of container traffic in the world Ranked No.4 in terms of cargo throughput in China
Case 5	
Incorporation:	SOE reorganized in 1997, listed in China Supervised by a Chinese municipal government
Principal business:	Cargo ports development and operation
Key assets:	Terminals and warehouses
Operating performance:	Container throughput: 14.4 million TEUs in 2019
Industry position:	‘Industry leading port investment operator’
Case 6	
Incorporation:	Established in 1990, Shenzhen Non-profit-making institution A logistics industry association

Principal business:	Supervised by local municipal government agencies More than 40 corporate members Conducting research on key issues of industry development, coordinating pricing policies, handling complaints, communicating with Government agencies on industry affairs, providing professional training and information services, and protecting legal interests of its members
Case 7	
Incorporation:	Established in 1984, Guangzhou Non-profit-making institution A logistics industry association Supervised by local provincial government agencies More than 70 corporate members
Principal business:	Conducting research on port industry development, investment evaluation, professional qualification assessment, professional training, business consulting, industry exhibition, coordination among members, handling trade disputes, and conducting anti-dumping investigations
Case 8	
Incorporation:	Established in 1996, Shenzhen A vocational training institution Financially supported by local government agencies
Principal business:	Providing high end training courses for logistics practitioners nationwide, continuing education for logistics professionals of the national level, and hosting professional skills contests in domestic and international logistics industry

(Source: Annual reports of Case Companies and transcripts of interviewees)

3.4.2 Criteria for selecting Case Companies

The five Case Companies are industry leaders with global operations, and the top executives selected for in-depth interviews are familiar with the operation, management, and the industrial contexts. The top executives selected are elites in logistics industry in China, including CEOs, directors of development, directors of

operation, company spokesperson, and chairperson of supervision committee. A Case Company refers to the group company including its subsidiaries, where a key cargo port refers to the hub for exchange of mode of transportation and information. The study adopted four concrete criteria for selecting Case Companies: (1) Chinese State-owned port enterprises with domestic and global operations, (2) key industry players with SCA in terms of market share or business momentum, (3) listed public companies whose shares are traded on stock exchanges, (4) significant contributions to the social and economic development of China in terms of market share and influences. Specifically, the first criterion refers to the capital structure of Case Companies. These firms are normally owned with more than 50 percent by another State-owned company representing 100 percent of Government interests, and with less than 50 percent by the private sector. The reasons for this criterion are that the ultimate controlling companies have the final say and responsibilities on strategic decisions and corporate growth. In addition, parent companies have strong financial positions, and they can provide strong support to Case Companies. The second criterion refers to the leadership of the Case Companies. These firms are industry leaders in terms of their business spectrums, assets size, geographical locations, performances, equity share listing status, and historical inheritances. The reasons for this criterion are that their leading positions in the industry imply their successes in operation and management. Therefore, the data collected from these leading enterprises are representative and appropriate for analyses. The third criterion refers to their securities listing status. The shares of these firms were listed on stock exchanges in Hong Kong, and the mainland, China. The reasons for this criterion include (1) the securities listing status on stock exchanges implies that their operation and corporate governance were strictly regulated by Government regulators, (2) the executives of Case Companies are career professionals with rich experiences and professional

expertise, (3) the data collected from Case Companies were authentic and consistent because important data such as the annual reports were audited by independent auditing firms according to professional rules and Government regulations. The fourth criterion refers to the important roles played by these Case Companies. The reason for this criterion is that such important roles, played by these Case Companies for the Chinese economic development, give weights to the significance of this study. All of these five Case Companies own and operate container terminals. Among these firms, two companies own and operate terminals along the Chinese coastal provinces and terminals overseas. In addition, one company operates in southern China; three companies own and operate terminals in Hong Kong and river trade terminals in southern China; and one company operates passenger ferry services, which is the top high-speed passenger ferry operator in China.

3.5 Data collection

The purpose of data collection is to gather primary data and secondary data. It employed two methods: (1) performing desk-based search for annual reports of Case Companies, and (2) conducting in-depth interviews for data from interviewees. The reason to apply desk-base research is that relevant documented data can be obtained from companies' websites, publications, and public media. The reason to apply in-depth interview is that it helps better understand companies' strategic decisions, responses to business challenges, and the process of building core competencies to achieve strategic goals. Especially, in in-depth interviews, the interviewer had the opportunities to record and understand the exact meaning of the discourse of the interviewees, and to clarify timely any ambiguities with interviewees (Gioia et al, 1994, p.367). Such understanding facilitates the text analysis and thematic coding process at data analysis phase.

3.5.1 Instruments for data collection

To accommodate data collection, three instruments were used, i.e., a Table Shell (e.g., Table 3 & 4), a protocol (Appendix 1), and a questionnaire (Appendix 2). The Table Shell was used to list data items to be collected (Yin, 2003, p.75), and the protocol and questionnaire are used for collecting data from in-depth interviews (Yin, 2003, p.67; Yin, 2018, p.93). The instruments of protocol and the questionnaire were developed from the literature review, and they were relied on during the data collection process. These devices ensure the validity, reliability, and effective execution of the research because data gathered are triangulated.

A Table Shell was prepared for data collection by desk-based research, with suggested themes and categories emerged from the literature review. It was structured with rows and columns. The rows identify Case Companies and the columns show suggested themes and dimensions. The shells show data collected from companies' annual reports, which contain valuable information about management, operation, marketing, R & D, human resources management, and financial particulars.

Two instruments were used for in-depth interviews: the data collection protocol and the questionnaire (Yin, 2003, p.68). The protocol was used to assure proper execution of data collection, and it serves as a guide for action (Appendix 1). The questionnaire was incorporated in the protocol, but it was used independently. The protocol focused on the in-depth interview process; it contains purposes, requirements of data, data collection procedures, questionnaire, rules, contents, and the evaluation of the in-depth interview (Yin, 2003, p.69). It is a semi-structured questionnaire with questions developed from decomposition framework (Figure 1), the literature review, and the research questions. The questionnaire consists of four parts: the demographic

data, the setting, the interview questions, and the confirmation of interviewees. The demographic section includes particulars of the interviewee, and the setting section includes the place, time, and duration. The question section includes 37 specific questions under eight headings: (1) background, (2) strengths and capabilities, (3) relationship between tangible assets and building core competencies, (4) important events, (5) strategic decisions, (6) development strategies, (7) capability building, (8) resources. Finally, the confirmation section includes the statement for accepting recording during the interviews.

3.5.2 Data sources

The researcher collected data from two sources: secondary data from annual reports of Case Companies on websites and the primary data from in-depth interviews with eight top executives of Case Companies and three directors from three industry associations. For this research, data mean evidence that contain information in words, phrases or symbols presented in printed materials or contained in video or audio devices, and such evidence are relevant to the research questions. Such data were evaluated, and they should satisfy three criteria: legality, relevancy, and authenticity. Legality means that the evidence providers are appropriate in terms of their titles and authorities to provide such data, or the data are gathered from lawful resources. Relevancy means that data should be logically relevant to the research questions, and authenticity means that data should be real in forms.

Five reasons were considered to accept data gathered from these two resources. First, this study used the text analysis and the content analysis methods on company documents and transcripts of in-depth interviews because they are appropriate for such analysis (Edgar and Lockwood, 2008, p.21). Second, preliminary findings can be

identified during the analysis on companies' annual reports, and then such findings can be refined by analysis on data gathered from in-depth interviews (Edgar and Lockwood, 2008, p.24). Third, similarities or differences of analysis results on these two types of data suggest conformity in emerging themes or rooms for searching further data. Fourth, annual reports of Case Companies are stipulated documents for annual public disclosure, and these listed Case Companies are legally responsible for the accuracy and genuineness of such documents. Fifth, rich data can be explored from the in-depth interviews.

This triangulated sources ensured justification and due diligent practice of the study. Company annual reports and documents provided important information of the Case Companies in terms of operating results, financial positions, vision, mission, development strategies, operation and marketing strategies, investment strategies, major investment transactions, and critical events. All these data are authentic evidence, consistent, and conclusive. The in-depth interviews were conducted with 11 interviewees including eight high-ranking executives of these five Case Companies and three directors from three industry associations. The in-depth interviews enabled the interviewer to understand the insights of the interviewees on the questions asked because these interviewees are elites purposively selected. Both data gathered from annual reports and in-depth interviews constitute legitimate evidence for analysis.

For data collating, all data gathered were retained in original formats, i.e., documents, recordings, and transcripts. The contents of recordings were transcribed in text form and translated from Chinese into English. Subsequently, such verbatim transcripts were presented, and the full annual reports remained in original format for analysis. The data gathered include ten recordings and one written note from 11 in-depth

interviews and 23 annual reports of the five Case Companies. The data collection commenced in May 2020 and completed in July 2020. The primary data and secondary data were summarized in Table 2 below:

Table 2 Particulars of data of in-depth interviews and annual reports

No.	Type of Data	Case	Duration (min.)	Transcript (Chn.Char.)
Recordings				
01	Recording	Case 1	35:13	6,014
02	Recording	Case 1	59:52	6,306
03	Written notes	Case 2	60:00	1,450
04	Recording	Case 3	55.19	9,091
05	Recording	Case 3	52:31	5,777
06	Recording	Case 3	105:37	20,295
07	Recording	Case 4	60:00	13,958
08	Recording	Case 5	50:00	7,114
09	Recording	Case 6	38:15	6,526
10	Recording	Case 7	38:45	5,856
11	Recording	Case 8	40:00	5,910
	Total		594.12	88,297
Documentation				
	Documentation	Case	Period	
01	Annual report	Case 1	2015-2019	5
02	Annual report	Case 2	2015-2019	5
03	Annual report	Case 3	2015-2019	5
04	Annual report	Case 4	2017-2019	3
05	Annual report	Case 5	2015-2019	5
	Total			23

The data collected include a total of 594.12 minutes of recordings and one written note from 11 in-depth interviews, and 23 annual reports from Case Companies for the period from 2015 to 2019. The recordings were transcribed into Chinese in 147 pages with a total of 88,297 Chinese characters. Five annual reports were gathered from each of four Case Companies, and three annual reports were gathered from Case 4 because it was reorganized and listed in 2017.

3.5.3 Data collection by desk-based research

The first step of data collection was to perform desk-based research on companies' websites. Background information of Case Companies was searched to understand their operation and the management. Specific documents required were annual reports, which contained general data about Case Companies. Such data included performance results, financial positions, corporate strategies, routines, rules, corporate culture, business plans, R & D, and human resources information. The most valuable information was contained in the sections of Chairman's Statement, and Operation Analysis, where the corporate strategies, assets, and issues of responding strategies to business challenges were addressed. The reason to use annual reports was that the board of directors and executives guaranteed the contents of such documents in terms of factuality, accuracy, and completeness. Moreover, these executives were jointly and severally liable for any misrepresentations, misleading statements or material omissions therein. Analyzing these documents enables to identify further sources and type of relevant data.

3.5.4 Data collection by in-depth interview

The following step was to conduct in-depth interviews on at least one executive of the top management from each Case Company. These interviewees were selected based on their capabilities in terms of their positions, experiences, education, profession, and functions. The reasons considered for the selection are that education means participants' knowledge in the field; position means the responsibilities and authorities they possess; and profession means expertise in the industry. Their capacities covered corporate strategic decision-making, operation, management, financing, R & D, and human resources management. All these interviewees have received their college education, and they have been working with their companies for more than 20 years.

A total of 11 individual in-depth interviews were conducted from May 2020 to July 2020. These in-depth interviews were conducted in Chinese, and the transcripts and English translation were completed in September 2020.

Fieldwork of the in-depth interviews

The fieldwork included seven tasks. First, the researcher made an announcement to interviewees about the identity of the interviewer, the purpose, and confidentiality of the interview, and the ways to conduct the in-depth interviews. Second, detailed notes (or recordings, subject to interviewees' approval) were taken for all in-depth interviews. Third, follow-up questions and clarifications for emerged issues, codes, categories, or themes were also conducted where necessary. Fourth, interview notes were reviewed and edited to ensure accuracy of the contents. Fifth, impressions, critical events, patterns, paths, and mechanisms based on interview outcomes were documented for further analysis. Sixth, interview outcomes of Case Companies were compared and contrasted to identify further interview questions until saturation, and triangulated checking was used to ensure accuracy and quality of data. Seventh, the interviewer conducted the in-depth interviews in Chinese, and translated the transcripts in English later on for analysis.

The in-depth interview activities were guided by the protocol and the questionnaires throughout the processes, and such activities were taken place in Hong Kong, Shenzhen, and Guangzhou, China. Among these 11 interviewees, three of them were former colleagues of the interviewer; and the rest of them were introduced by former colleagues or friends. Three in-depth interviews were conducted through WeChat video meetings via Hong Kong and Guangzhou, China; and eight in-depth interviews were conducted by face-to-face interactions. Four face-to-face in-depth interviews

took place in Shenzhen, and another four were conducted in Guangzhou. Ten recordings of the in-depth interviews were made by two mobile phones (i.e., an Apple Iphone and a Huawei phone) at the same time to avoid mis-operation. One interviewee rejected the recording of the interview, and accordingly, notes were taken during that interview. The venues of the face-to-face in-depth interviews were the offices of the interviewees.

The interviewer fixed the date, time, and venue with interviewees before fieldwork commenced. The interviewer also advised the interviewees about the purpose, topic, and research questions of the interview. Interview questionnaires were sent to three interviewees, who were interviewed via WeChat, beforehand at their requests. Upon commencing interviews at venues, the interviewer first expressed his appreciations to interviewees for accepting the visits. Then the interviewer spent about ten minutes to introduce and explain the general procedures of the interview, and answered interviewees' questions regarding the meaning of some terms, e.g., core competencies, capabilities, and path-dependency. The questionnaire was then presented to the interviewee. The interviewer encouraged interviewees to provide comments or views and facts or evidence to the questions; in addition, he advised interviewees to be free to reject answering any of the questions and/or to provide any additional information during interviews. Upon confirmation for making recordings, two mobile phones were used to ensure successful recordings, and consent letters were presented to the interviewees for their written confirmation (Appendix 2).

The interviewer asked questions and allowed interviewees flexibility to answer questions based on the questionnaire prepared in English with a Chinese translation. Although these questions were predetermined, interviewees were encouraged to talk

openly, and they had the right to refuse to answer any questions. Throughout the interviews, the interviewer aimed to understand the views of the interviewees about the questions rather than seeking their agreements or disagreements to the questions. Three interviewees answered the questions in the sequence of the questionnaire, while the rest answered questions with their initiatives on their own perceptions. Most of the time, interviewees were encouraged to provide comments, views, inferences, facts or evidence to the questions. The interviewer made notes on the questionnaire along specific questions, and only interrupted the discourse to clarify issues where it was necessary. The duration of each interview was around one hour, followed by subsequent calls for clarification or further discussion on issues arising from the interviews from time to time. All data gathered were later transcribed into text format and then translated into English by the interviewer.

3.6 Data analysis

The purposes of data analysis are to search for patterns, insights, or concepts, and to develop main themes and theoretical interpretations. The data analysis consists of two steps: (1) conducting text and content analyses (Blumberg, 2008, p.361), (2) performing individual case analysis and cross-case synthesis analysis (Yin, 2003, p.133). At the data analysis phase, the researcher tried to reflect and represent the experiences, meanings, and judgments of interviewees with considerations of the discourse context to determine the exact meanings of the discourse from interviewees. Three techniques were used in data analysis: the tabulated analysis by using the *table shell* instrument, the analytical framework analysis by using the *data structure*, and the *narrative analysis* by discussion (Blumberg, 2008, p.364). Accordingly, the results of the analyses were presented in the same format respectively.

The multiple-case study design enables the researcher to analyse and present the data separately, and to compare them jointly with interpretations. The purpose of the individual case analysis was to generate solid results of each Case; and the purpose of the cross-case comparison was to establish relationships among individual results. These two methods were used together to develop main themes, to organise these main themes into patterns, time series or logic models, and finally to synthesize these results to develop findings. These results were then compared with the research questions, existing literature, and the topic theory. When discrepancies emerged, evidence would be sought from the preliminary data for proof and explanations in terms of the premises and the underlying assumptions. If the findings were supported with solid evidence; these findings would be considered justified and relevant.

The study performed five individual case analyses based on 23 annual reports and eight in-depth interview transcripts. In addition, the study included three individual case analyses with three in-depth interviews on three industry associations. In the individual case analysis, each case was examined by textual analysis and the theme development analysis. In cross-case analysis, the results of individual cases and the combined results from the three industry associations were juxtaposed in a combined table shell for data comparison (i.e., Table 3 and Table 4); wherein the analyses of three industry associations were for triangulation purpose. Following the process of the individual case analysis, the researcher performed the cross-case synthesis, which aggregated findings across a series of individual studies (Yin, 2018, p.196). Accordingly, the combined results were obtained (Table 4). Data analyses were accomplished in October 2020.

3.6.1 Instruments for data analysis

The data analyses used three instruments: a *table shell* (Yin, 2003, p.75 and p.134; Yin, 2018, p.288), a *data structure* (Gioia et al., 1994, p.369; Clark et al., 2010, p.409), and a *data table* (Clark et al., 2010, p.410). First, the table shell was especially used for patterns analysis (Table 3 and 4). Second, the data structure (an analytical framework or analytical tree) was particularly used in thematic analysis. Third, the data table (a list of representative data) was purposively used to support themes and concepts emerged and shown in the data structure. These three instruments involves three steps from developing primary concepts (open coding), recognizing themes (axial coding), and identifying dimension (selective coding); these steps are similar with that of the Grounded Theory (Glaser, 2016). These instruments align data, concepts, and dimensions, providing solid grounds for developing theoretical interpretations to the reality under study.

In table shells, the researcher put words in the shells (Yin, 2003, p.134) to display the data of individual cases according to their features and similarities. The overall pattern in the table shells (Table 3 and 4) led to suggestions to results and conclusions. However, cross-case patterns relied strongly on argumentative interpretations, which required the researcher to develop arguments with data supports. In the meantime, the thematic analysis framework of Gioia et al. (1994) was utilised, that consists of four categories: (1) the informant codes (terms), (2) analytical codes, (3) aggregated secondary-order categories, (4) overarching dimensions. This framework illustrated the process for developing main themes from primary data, and it showed the repeated comparison process among primary data and analytical codes for generating abstracted categories and dimensions. In addition, Clark et al.' (2010) method was used to present the results of the thematic analysis by a form of data structure under

three headings, i.e., concepts, themes, and dimensions (Clark et al, 2010, p.409). The research adopted the replication logic, which treated these cases analogously serving to fit or unfit those concepts, themes or relationships (Eisenhardt, 1989, p.542). The replication logic suggested that case confirmed with emergent concepts, themes, dimensions or relationships will enhance validity and reliability of the study. While cases disconfirmed with the same results will be treated as opportunities to refine and extend the study (Eisenhardt, 1989, p.542). The results of the data analyses were presented in data structure, and data table (Clark et al, 2010, p.409). Where the data table provided representative supporting data to the emerged themes; the data structure provided emerged concepts, themes, and dimensions to illustrating their relationships; and the table shell provided key concepts emerged from data analysis (Yin, 2018, p.103). The findings were presented in data structure and data table with descriptive narratives.

3.6.2 Data analysis procedures

Data collection and data analysis were performed at the same time, and new data were continuously compared with the previous codes and data. The researcher followed the data analysis methods of Gioia et al. (1994, p.369) throughout the data analysis. In the process, the researcher conceptualized the data into categories, labeled them, and determined their properties and dimensions by applying the techniques of the microanalysis, which means asking questions in terms of properties and dimensions. At the phase of open coding, the researcher analysed the text sentence by sentence, and coded the concepts of the data contained in each sentence. These codes were categorized with the same theme derived from both primary data and secondary data. Specifically the researcher used three analytical techniques: the scenario-condition, question asking, and the thematic analysis. The scenario-condition analysis was used

mainly for identifying concepts and categories. The question-asking technique was used mainly for identifying properties and dimensions of a concept, i.e., open coding (Neuman, 2006, p.461). In addition, the thematic analysis technique was used for developing explanations to the research problem. The applications of these three techniques were not mutually exclusive, but they were exchangeable to be used for the same passage of data. When concepts, properties, and dimensions were identified and saturated, then the logic inferences for cause and effect analysis will be applied.

At the phase of axial coding (Neuman, 2006, p.462), the researcher identified and built up the relations among categories by the logic of causal effect. At the phase of selective coding (Neuman, 2006, p.464), the researcher extracted the categories, and developed the main theme categories to form the basis to build up explanations to the research problem. The logic inferences and the core competence theory were applied to explain the phenomenon based on the outcome of the analyses. Axial coding was performed to establish the relationship among categories in terms of causality, time sequences, contexts, similarities, differences, equity, type, structure, functions, or processes. Deep analysis was performed one category at a time to explore the properties and their dimensions. Based on similarities of properties and dimensions, the relations among categories were established. The main categories were identified in the process of axial coding; while the core category and the main themes were selected in the selective coding process. Concepts, themes, and dimensions were then established. In this case, theme categories were selected in terms of their properties, dimensions, conditions, and consequences. The findings and explanations were then presented in the form of conceptualized frameworks (Figure 9).

3.6.3 Individual case analysis

The process of data analysis on individual case includes four concrete steps, data collation, data display, data reduction, and data conclusion. Accordingly, the text and content analyses methods were used for thematic analysis, which means selective reductions of words or phrases. In this process, the thematic analysis method consists of eight steps: (1) preparation of data, (2) definition of the unit of analysis, (3) development of categories, (4) test of coding scheme on a sample of text, (5) coding of the whole text, (6) assessment of coding consistency, (7) conclusions from the coded data, (8) reporting about methods and findings (Mayer, 2015, p.62). The researcher used the table shell (Table 3 and 4) instrument as the coding manual to record concepts, themes, and dimensions.

The thematic analysis performed two tasks: the first task was to determine themes until saturation that no new themes were emerged in the process, and the second one was to identify the relations among themes. In the process, the determining themes were extracted from themes of coded and labeled groups of categories and concepts, and the main themes were considered the basis for developing theories. The meaning of a term was determined by reference of its language field or the context of a word or a term. This coding process includes four steps: (1) to develop concepts from data gathered and to code them openly, (2) to continue to compare the data and the concepts and ask questions systematically in terms of properties and dimensions of concepts, (3) to make axial coding to establish relationships among concepts or categories to establish the conceptual framework, (4) to develop theoretical explanations.

3.6.4 Cross-case analysis

The cross-case comparisons (synthesis) focused on detailed analysis of key issues, while the text and content analysis aimed to develop concepts, themes, dimensions, and theory. Two devices were used: the table shell and analytical framework (Yin, 2018, p.95; Gioia et al 1994, p.369; Clark et al, 2010, p.409). The table shell was used again to display evidence, which summarized and tabulated the evidence underlying concepts, themes, and dimensions (Table 4). The reasons to use the instrument to tabulate such data include (1) such evidence can be easily used for analysis, (2) the juxtaposition of results of individual case can be compared for similarities and differences that allow the researcher to conduct further investigation until data are saturated (Eisenhardt, 1989, pp.541 and 542). The analytical framework was a tool looks like a 'tree', which is used to establish open coding, axial coding, and selective coding (Corbin and Strauss, 2015; Glaser, 2016). In content analysis, the researcher assigned codes to the data; and each code represented a concept of abstraction of potential interest. The thematic analysis method was also performed in cross-case analysis.

Based on the data, the analyses at the selective coding phase focused on eight suggested aspects: (1) critical events; (2) strategic decisions; (3) knowledge; (4) path-dependency; (5) capabilities; (6) resources; (7) the mechanisms of building core competencies, (8) core competencies. Among these dimensions, No. 5, No. 6, No. 7, and No. 8 were selected according to the decomposition framework (Figure 1); No.3 and No.4 were selected according to findings of the literature review; and No.1 and No.2 were selected as they emerged from the empirical data analysis. These dimensions were addressed according to Eisenhardt (1989) that dimensions can be revealed by literature review or suggested by research questions, or the researcher can

even choose some potential dimensions (p.540). In the text and content analyses, the researcher focused on frequent occurring words or phrases (Blumberg et al., 2008, p.361). The purpose of this task was to identify composing elements of the reality and their relations. It also aimed to distinguish conditions, process, inputs, and outcomes.

3.7 Trustworthiness

To increase the trustworthiness of the study, the research adopted triangulation in research design in terms of theories, research approaches, methods of data collection and analysis, sources of data, and types of Case Companies. This approach enabled the investigator to look at the phenomenon under study from different theoretical perspectives, and to collect data from multiple sources. Thus, specific measures were taken to ensure validity, reliability, and credibility in accordance with the suggestions of Yin (2003, 2018). Specially, for establishing trustworthiness of the study, Yin (2018) suggested that four guidelines for data collection: (1) collect multiple sources of data, (2) create a research database, (3) ensure a chain of evidence, and (4) perform due diligence (P.126-136). Accordingly, the investigator personally conducted the study throughout the project and maintained mutual benefit relationships with participants. In the study, the researcher maintained awareness of the strengths and weakness of the research approaches and the instruments employed, and the researcher exercised due diligence in data verification through follow-up contacts with participants.

Validity and reliability

For validity and reliability, the research followed the guidelines of Yin (2018), who suggests four tests with specific tactics. These validity tests are construct test, internal test, external text, and reliability test. Key tactics are (1) multiple sources of data for construct test, (2) logic models for internal test, (3) replication logic for multiple-case

studies for external test, and (4) protocol, database, and chain of evidence for reliability test (Yin, 2018, p.43). For validity of the study, the researcher employed triangulation in data collection including official documents, publications, and face-to-face interviews; and the methodological triangulation was applied in text analysis. The research followed the principle that the quality of documents should be ensured in terms of authenticity, credibility and repetitiveness (Mayer, 2015, p.62). For quality of the investigation, the researcher kept alert about the skills required. Such skills include how to ask valid questions and how to act as an attentive listener. The researcher also maintained firm grasps of and flexible to research questions, as well as unbiased on preconceived notions.

The research design aimed to achieve assurance of trustworthiness in terms of validity and reliability, the validity of the construction of the study, and the reliability of the research design. Accordingly, triangulated methods for data collection and analysis were adopted. For assurance, a working sheet system was developed to keep safe and proper records and evidence of the study. For administration purpose, a detailed outline for the study procedure was prepared, which includes a research agenda and a protocol to collect data from interviews to increase reliability (Yin, 2003) (Appendix 1). To ensure validity and reliability of the study, the research design incorporates tactics by using triangulated sources of evidence, e.g., documents, archives, in-depth interviews, and protocols. In addition, the design established logical chain of evidence. For construct validity, the research investigated the Case Company's documents and data gathered from in-depth interviews because these sources provided genuine data.

The research established the chain of evidence from the profiles of Case Companies to the details of the performance indicators and to the feedbacks or comments from

interviewees. For internal validity assurance, the research avoided ignorance of other possible mediating or moderating factors when analyzing causal relationships among factors for building mechanisms of core competencies. For external validity, the research aimed to provide explanations to the phenomenon under study rather than generalizing the findings of the study to all port enterprises in the same context. For reliability, the research retained operational procedures, concrete documents, data sources, interview questionnaires, and the protocol used as references for future studies with the aim to enable later undertakings to achieve the similar results (Yin, 2003, p.p.33-39). Furthermore, the research adhered to data validation, which refers to the form and content, sources, selection, and principles. The data used in the research were in the form of annual reports and verbatim transcripts of in-depth interviews (Yin, 2018, 114); and the data selection is subject to the criteria of authenticity, relevancy, and legality.

The influence of knowledge and experiences in investigation

The knowledge and experiences of the researcher play an important role in the study because the reality is created through interactions between the investigator and the research subjects. Undoubtedly, in this context, the investigator's role is influenced by his existing experience and knowledge (Lincoln, 2012, p.159). Such influence can be advantageous or disadvantageous to the study. This problem can be referred to as reflexivity, which means researcher's preferences or thinking may influence participants and vice versa. Here, 'Reflexivity... implies that social realities are constructed between the researcher and the participants in dialogue' (Munkejord, 2009, p.155). During the research activities, the problem of reflexivity may occur because the investigator is a part of the creation process of the meaning as the research paradigm suggests that human is information processor. Specifically, researcher's

knowledge and experience, in the context where the Case Companies operate, may influence the investigation through interaction with participants in the forms of cognitions, preferences or preconceived notions. Especially, reflexivity may occur when the investigator asks participants preferential questions intentionally or overlooks important aspects of the questions. Such practice may therefore enhance certain aspects of the issue under investigation. The opposite situation may be true, if participants answer questions submissively as the questions implicitly suggested, or reluctantly; such practice may give rise to misleading or biased answers.

On the one hand, professional knowledge and experiences have the following advantage for the investigation:

- Help distinguish authentic and relevant information to the study, and evaluate factual evidence, especially in the coding process of data analysis;
- Compensate missing information, so that the researcher can better understand the meaning of the information obtained from participants;
- Enable researchers to ask the specific and meaningful question;
- Keep researchers alert and sensitive on new ideas, rival interpretations, or concepts of information;
- Facilitate researcher's thinking because correct understanding of concepts is the basis of thinking. Clear understanding of technical terms (e.g., containers, supply chain, and logistics management) will help interpret and establish relationships among concepts or themes;
- Ensure the researcher to perform critical thinking, and to probe new information, concepts, themes, or dimensions;
- Promote rapport and efficient communication between the researcher and the participants because discourses are on their familiar context;

- Assure verification and evaluation of the research outcomes.

On the other hand, knowledge and experience may become weakness to the research due to certain circumstances:

- Existing knowledge are obsolete and not correct because the underlying conditions are changed.
- Experiences are not valid due to changes of conditions or methodology.
- Preconceptions or bias may occur for purposive selection of information or ignoring other important information unintentionally.
- Researcher's own findings may be mixed up participants' findings.

Five factors may cause reflexivity: (1) *the assumption of human nature*, (2) *the primacy effect*, (3) *the recent effect*, (4) *the halo effect*, and (5) *the social stereotype effect*. The assumption of human nature regards human nature as social constructor or information processor (Morgan and Smircich, 1986, p.492). The primacy effect of Lachins (1957) means that the first information may have stronger influence than that of subsequent information (Zhang, 2002, p.74). The recent effect of Lachins (1957) suggests that recent information will have a stronger influence to individuals' perceptions (Zhang, 2002, p.76). The halo effect of Dion et al. (1972) suggests investigators' cognitions may be affected by one's bias (Zhang, 2002, p.76). The social stereotype effect refers to fixed views on certain groups of people or things that may cause bias or preconceptions (Zhang, 2002, p.77). The influences of these factors may be reflected on attitudes and behaviors of the investigator and the participants, or quality of data gathered. For example, factors 1, 4, and 5 suggest that limitations of cognitions or perceptions may exist, and bias may occur in social interactions. Factors 2 and 3 imply that one's stance or views may be influenced by changes of conditions.

Therefore, the influences of these five factors may eventually affect the quality of data gathered.

Yin (2018) pointed out that conducting in-depth interviews to capture interviewees' sense of reality and its meaning, reflexivity might occur. Such reflexivity may unknowingly influence the interviewer and the interviewee during in-depth interviews, thus it may contaminate or color interview material. This reflexive threat might occur in perspectives or preconceived notions of the interviewer or the interviewee (p.120). These perspectives and preconceived notions may be caused by knowledge and experiences of the interviewer and the interviewee. However, these knowledge and experiences can be helpful in data collection, analysis, and interpretation. First, such knowledge and experience can help the interviewer to select interviewees, decide interview questions, and choosing proper data sources. It can help the researcher to evaluate data especially relating to technical terms used in the logistics industry. It will be also helpful in thematic analysis because of the knowledge and the experience in the context of the industry. Second, it helps the interpreter to establish realistic relationship among categories and dimensions for formulation of theories. Third, the interviewee can better understand the questions asked by the interviewer because both have the common professional background for discourse. Despite of these merits, reflexivity will occur, and will not be overcome fully (Yin, 2018, p.120). The important thing is that the researcher should be sensitive to the existence of reflexivity in in-depth interviews. Nevertheless, the researcher may try to manage it by deploying certain techniques including triangulation in data sources, multiple interviewees, interviewees' review of data, chain of evidence, and cross-case analysis (Yin, 2018, p.120).

Since the study adopts constructivism paradigm, the investigator may exchange views with interviewees during discourse; especially, when the investigator explains questions to participants. As Robson (2011) pointed out that, ‘Your analysis may be biased, not only because you are drawing inferences from non-representative processes, but also because of your own biases as an information processor’ (p.487). Therefore, this reflexivity problem should be mindfully managed; even though, knowledge and experience may be helpful in understand the actual meaning of the discourse, especially in understand technical terms, which will facilitate thinking and processing of information. Some possible measures to avoid reflexivity problems include the following:

- Seeking views, but not agreements on questions asked
- Focusing on empirical data evidence
- Seeking clarification from participants
- Performing cross- case comparisons
- Applying triangulation in data collection and analysis, and interpretation of findings
- Maintaining critical thinking

Most importantly, participants should be allowed freely express their views or even reject answering questions. In addition, participants should be informed the purpose of the investigation, and the benefits of resolutions to practical problems. To ensure validity and reliability of the study, the triangulation should be used because the researcher may not be able to influence every participant at every time and to the same extent. The researcher can also compare the data of each interviewee, and consult participants for verification (Ying, 2018). Finally, the investigator should be a listener, recorder, and processor of the information provided by interviewees, but not

an information provider or data creator. The role of the researcher is to facilitate the creation of the understanding of the reality, but not an information provider. In order to ensure validity and reliability of the investigation, the investigator should be aware to perform his role as a listener and an information processor. Finally, the investigator should seek feedbacks, clarifications or conformation on follow-up issues from interviewees to make sure exact meanings of data are obtained.

3.8 Ethical compliance

The goal to adhere to the ethical compliance is to conduct the research in a moral and responsible way, and to ensure that the research will not hurt any participants from research activities (Blumberg et al., 2008, p.179). In this study, the ethical principles refer to moral choices when the researcher interacts with participants whereby a social bound was established (Booth, Colomb, and Williams, 2008, p.273). Specifically, these principles refer to statutory duties, applicable laws, UWTSD's regulations, and traditions of the academic community. The research was governed by the regulations of UWTSD, laws in Hong Kong and the mainland in China because the research was conducted in China. These ethical considerations were complied with throughout the process of the investigation, i.e., research design, selection of Case Companies, data collection and analysis, and interpretation. The study adhered to ethical compliance in two aspects: (1) obligation to participants, and (2) proper treatment of data. The research adopted the code-governed approach and carried out in compliance with relevant professional codes, norms, values (privacy, freedom and honesty), traditions of moral practices, and legal requirements (Blumberg et al., 2008, p.154).

With deontology to participants, the researcher took into consideration of the interests of stakeholders such as the interviewees, researcher, and the Case Companies.

Responsibilities to research participants include minimizing disturbances to participating parties, anticipating and guarding participant's interests against harm. Accordingly, the researcher declared any conflicts of interest to the participants by clearly stating the purpose of the study and the use of the data obtained from interviews. This practice allowed interviewees to assess the advantage and disadvantage for accepting interviews. In practice, the researcher protected the interests of Case Companies, participants in in-depth interviews in terms of privacy, confidentiality, safety, and rights of informed consents. Accordingly, the names of the Case Companies and interviewees were anonymous. The research avoided taking actions that might cause coercion, deception, physical harm, discomfort, pain, embarrassment or loss of privacy to Case Companies or participants. To these ends, the researcher complied with relevant norms, regulations or laws that guide the research to make the moral choices to establish relationships with participants. The researcher used devices to ensure that ethical considerations were complied with in in-depth interviews. These devices include Letter of Consent for interviewees and the protocol, indicating that interviewees have the rights to refuse answering any questions asked. In addition, the interviewer gave an introduction of the purpose and procedures of the investigation and announced that interviewees have the rights to refuse answering questions or withdraw from the interview.

Proper treatment of data is crucial for the quality of the study. The researcher took care to avoid falsification or misrepresentation of evidence, data, and findings or conclusions. In practice, the researcher endeavored to avoid misconducts, or manipulation of the data. Data protection principles were adhered in all aspects of the study such as data collection, accuracy, retention, utilisation, security, and data openness and accessibility. The researcher upheld ethical principles to avoid

misconducts, namely plagiarizing, making fake results or misusing data, using unreliable data, concealing disagreement, distorting different views, and concealing sources for others to follow (Booth et al., 2008, p.274). In addition, the researcher exercised care and rigor in treatment of data and investigation process. For example, the researcher stored the data in safe places, prepared two backups, and used private computers. Moreover, the researcher informed interviewees and Case Companies the progress of the investigation when taking in-depth interviews.

Chapter 4 Data analysis and results (individual case analysis)

The purpose of the individual case analysis is to develop potential concepts, themes, and dimensions from data. The results of such analyses were presented in *narrative texts*, *table shells*, and *data structures*; and the representative supporting data were presented in *data tables*. All results were based on the analyses of data from annual reports and interview transcripts. Specifically, the data structures show the results of the thematic analysis, and the narrative texts provide supplementary information to data structures. The data tables furnished representative empirical data to support themes in data structures.

In this process, data were analysed and the preliminary theory generation was performed (Eisenhardt, 1989, p.533). The iterated comparisons between concepts, themes, and dimensions were performed to develop definitions, relationships, and the theoretical frameworks (Eisenhardt, 1989, p.541 & p.542). The emerged concepts, themes, and dimension are different as compared to those terms suggested by literature; for example, new dimensions of critical event, responsive strategies, knowledge, path-dependency, and sustainable processes were included in the data structure. The reasons to use these different terms, in the data structure, were the expanded inclusions of those concepts extracted from empirical data. In data analysis, two main tasks were pursued, the text analysis and the thematic analysis. For in-depth interview data, text analysis is used to identify and understand key events, comments, views, warrants, or inferences contained in data; and the thematic analysis is to develop concepts, themes, and dimension. For documented materials, the text and thematic analyses focused on the sections of Chairman's Statements, Operation Review, and other sections in company annual reports. The text and thematic analyses were used to gain deeper understanding of data in order to provide a solid basis for the

generation of theoretical interpretations.

Results of individual Case analysis

Individual case analyses were performed on five Case Companies and three industry associations. Two kinds of individual case analyses were conducted based on the data. For each case, analyses on transcripts were conducted, and then these results were combined with the results of the analyses of companies' annual reports. The results of these analyses are presented in data structures and supported by data tables. The results of the analyses of Case 6, Case 7, and Case 8 were also presented in the same format; yet they were combined into one because no analyses on annual reports were conducted. The results of these individual case analyses are presented in six combined data structures together with six combined data tables.

Individual case analysis: Case 1

Case Company 1 addressed the layout of port resources, core competencies, the paths to build core competencies, and development strategies in annual reports. These reports indicated critical events that the company had encountered over the past five years, with extensive discussions on its strategies of digital transformation for sustainable development and the global integration of its port resources. The firm stressed the building of an informational logistics ecosystem as a critical path to build core competencies by utilizing the technologies of digitalization including big data, 5G, algorithm, and the internet. The reason to build such a logistics ecosystem is the change of competition from the traditional way in terms of price and quantity into a new format of business ecosystem. Such an ecosystem is a network of participants connected to a focal platform, whereby participating firms cooperated to create shared value, but remain their interdependency in operation (Huang et al., 2019, pp.843 and

844).

First, the firm recognized and experienced critical challenges: the US-China trade friction, sluggish development of global economy, market competition, and the Covid-19 pandemic in the last few years. The firm also identified development opportunities arising from the technological advancements and the government policies, e.g., the ‘Belt and Road’ initiative, the opening-up, and the digital transformation of the shipping industry. These challenges and risks severely affected the operation and development of the firm, and the development opportunities suggested the need for business transformation.

Second, the company recognized that its core competencies were reflected in four areas: (1) the integration of resources, (2) the cooperation with business partners, (3) the innovation in business models, and (4) the application of advanced technologies in operation and assets improvement. Its sound layout of industrial clusters formed a complete industry chain and supply chain whereby the firm can leverage its core competencies. The cooperation with business partners and cargo owners established long-term business relationships, and it secured smooth and cost-effective shipping services and the customer satisfaction. The firm excelled in innovation in the areas of ship-building, terminal construction and operation, and the development of new business models such as redesigning industry format and building a logistics industry ecosystem. The firm also has insights about the application of advanced technologies in digitalized business transformation. Further, the firm insisted on promoting innovative integration of resources, facilitating innovative iteration of new technologies, and enhancing cooperation among its industry clusters. These core competencies are the sources for the firm to achieve SCA, enabling the firm to

become a leading logistics services provider in the world.

Third, the firm aims to build an intelligent shipping ecosystem based on a new shipping format. Specifically, the objectives are to build intelligent ships, intelligent services, intelligent logistics, and intelligent ports. This logistics ecosystem covers global operations in terms of terminals and shipping lines in Asia, the Mediterranean, Europe, and America. It also covers the layout of resources in the form of industry clusters including logistics, shipping, and the Internet + related business. These resources laid the solid basis for firm's core competencies, which secured the firm's leading position in global shipping industry.

Two senior executives were interviewed. Interviewee 1 (director and the company spokesperson) stressed four key issues: the question of how to satisfy customers' requirements and values, the reform on the supply side, the extended integration of industry chain resources, and the cooperation with business partners. He also talked about the digital business transformation by building a logistics ecosystem. Regarding the issue of satisfying the requirements and values of customers, Interviewee 1 emphasized the importance of the allocation of resources, and he pointed out that the innovative way to utilise different resources is to build a logistics ecosystem. The term of logistics ecosystem is a metaphor to symbolize operation context wherein different participants converge for business. The link of these participants is the flow of digital information on internet using technologies of 5G, big data, block chain, and algorithm. In this operating environment, an intelligent platform is built, and it functions as the foothold for business transactions. The core factors of the platform and the ecosystem are the algorithms and big data. Where algorithms provide optimal business solutions as decision choices for customers, the big data are the information inputs to

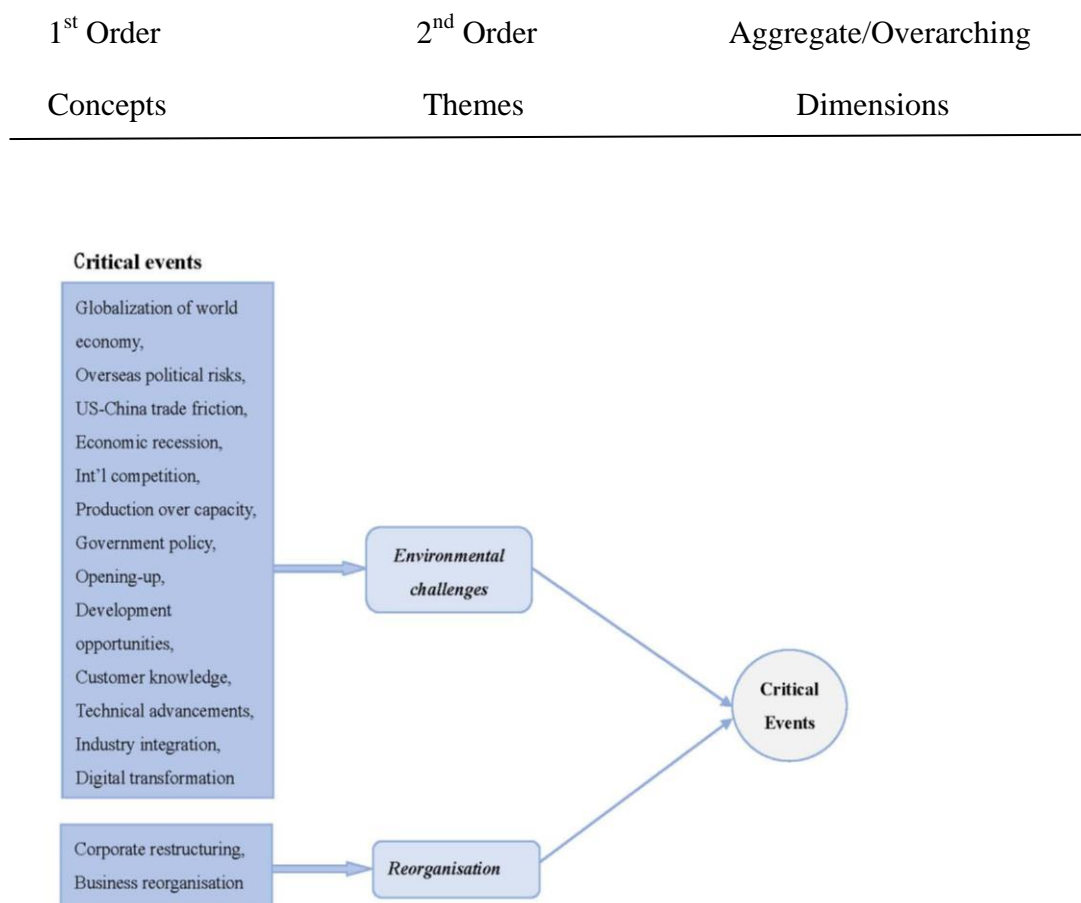
algorithms. Interviewee 1 emphasized that building such a logistics ecosystem is the way to build core competencies, and it is the direction of business transformation. He also pointed out that the values of the ecosystem lie in enhancing logistics efficiency and achieving cost-effectiveness resulting from effective integration of different resources. Such logistics efficiency and cost-effectiveness are the requirements and values pursued by customers.

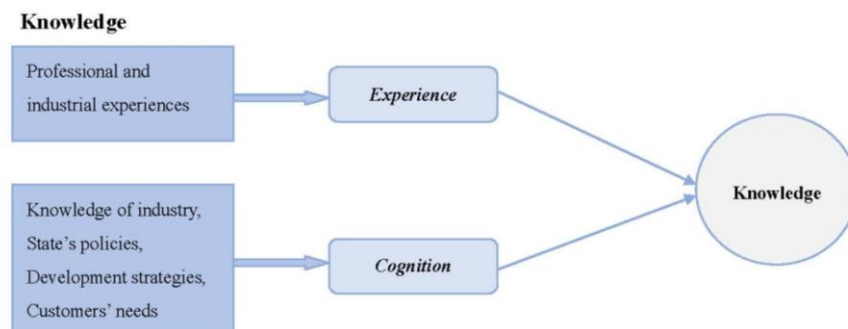
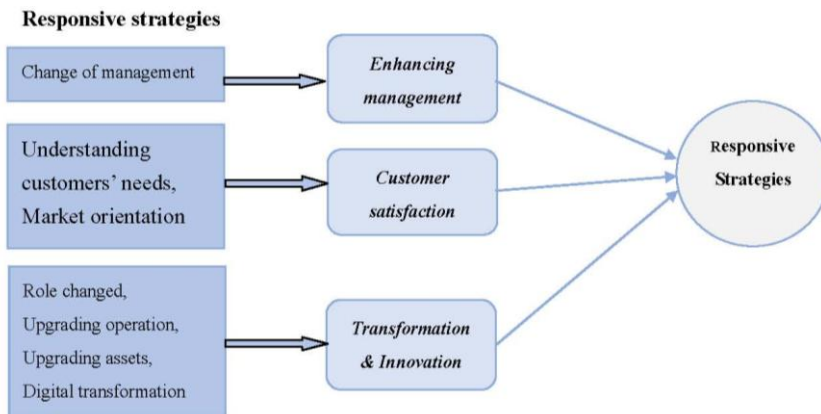
Interviewee 2, a director in charge of technical development projects, pointed out that the core competencies of the firm were exhibited in three domains and by two capabilities. The exhibits of core competencies are the integrated logistics services, business transformation, and shipbuilding, and the capabilities are technological capability and learning capability. Interviewee 2 expounded that the firm is now undertaking plans for strategic transformation, i.e., upgrading assets, and enhancing overseas cooperation to integrate resources to cope with the severe challenges from the global business environment. The firm owns shipyards that are capable to build the most advanced ships in the world. The firm established its technical research institution, which is equipped with technological expertise to build the planned digital logistics ecosystem. Regarding learning capabilities, the firm takes advanced foreign firms as the benchmarks for learning, and it had recruited professionals for overseas projects from all over the world. Interviewer 2 holds the view that it is necessary to build a complete industry chain in order to build core competencies because this approach secured the firm to gain SCA in the marketplace.

The practice of the firm showed that paths to build core competencies include building a full industry chain, integration of resources, cooperation with partners, innovation in business models with digital transformation, and the application of

advance technologies. The interviewees hold that the strategy to build logistics ecosystem is the unified way to build its core competencies. Further, they pointed out that the integration of ports at home and abroad was the development trend of the logistics industry in China. Obviously, the firm is developing a capacity to synchronize competencies to constitute the focal platform for the network organization (Fulconis, Saglietto and Pache, 2006, p.69). The analytical results of the transcripts and the annual reports were combined, and the emerged concepts, themes, and dimensions of such results were presented in Figure 2 below and with representative supporting data in Table 6 of Appendix 4.

Figure 2 Combined Data Structure: Case 1

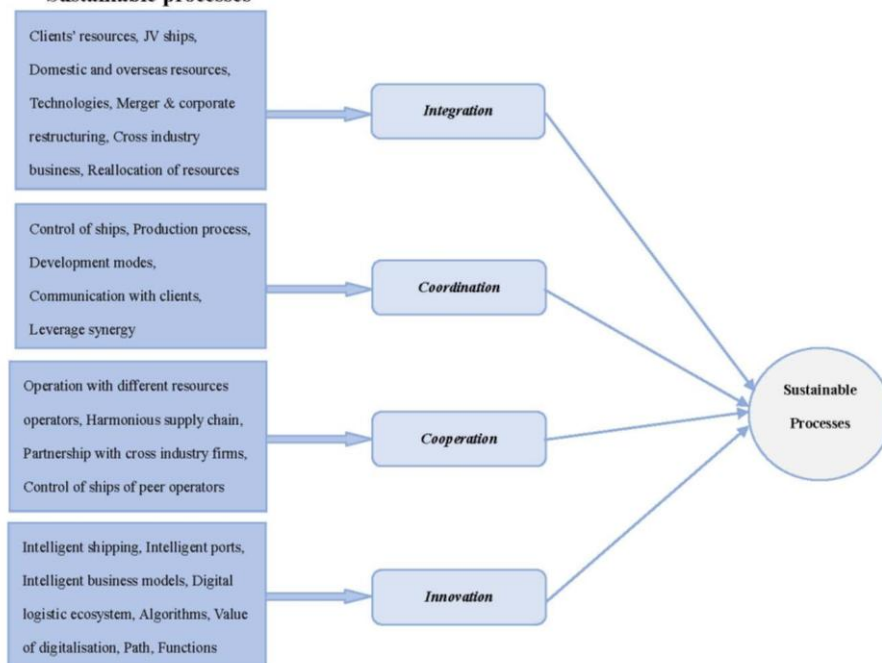




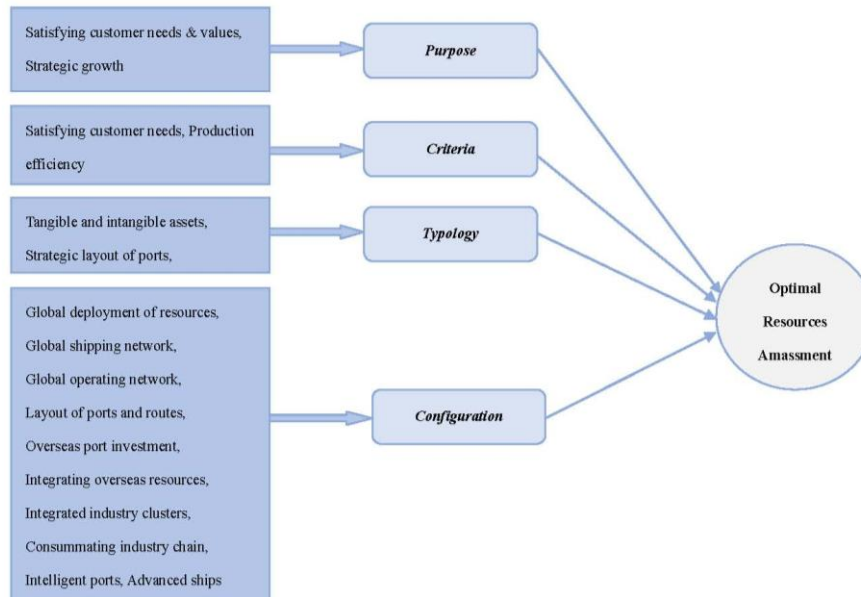
Collective learning



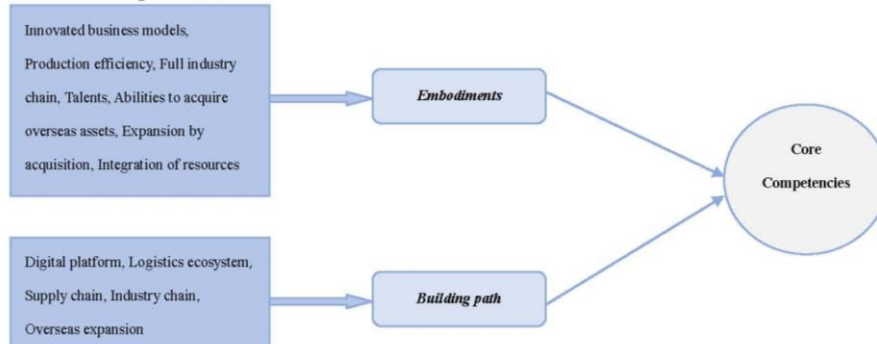
Sustainable processes



Optimal resource amassment



Core competencies



Individual case analysis: Case 2

Case Company 2 reported key events and achievements in annual reports over the period of five years under study. The Board of Directors elaborated key issues of the environmental situation, assets, operation, management, and performance in two sections of annual reports: the Chairman's Statement and the Management Discussion and Analysis. The Board further examined key factors of the complex changing environment, and it addressed the market opportunities and the ways to capitalize on such opportunities. Regarding building core competencies, documented information focused on acquiring and upgrading firm's assets, the digital transformation, and the strategy to become a world-class comprehensive logistics services provider. To this end, the firm set forth plans for digital operation transformation and the innovation as the development strategies.

First, the firm recognized the severe impacts from US-China trade friction, downward global economy, and the geopolitical tensions. To cope with these environmental challenges, the firm adopted the strategy to focus on the development of home-based ports, upgrading assets, and the innovation in business models. In addition, the company undertook strategies for overseas expansion and comprehensive and innovative development to capitalize on the opportunities arising from China's favorable social and economic development policies. These opportunities include the supply side structure reform, 'Belt and Road' initiative, and opening-up of the services sector to foreign firms.

Second, the company developed four core competencies: (1) quick learning, (2) replication of its successful development model, i.e., the comprehensive development model of 'Port-Park-City', (3) application of digital technologies, (4) innovation in

operation, marketing, and management systems. Specifically, the firm operates by benchmarking against the world-class standards, and it aims to build the global leading ports. In addition, the firm established its research institute for technological innovation and development. For corporate development, the firm successfully replicated its development model of 'Port-Park-City' in a number of ports in China and a pilot free trade zone in a foreign country. Such projects contribute to the overall performance of the firm. The technological capability resulted from firm's efforts and its substantial funds committed to R & D in the application of digital and network technologies. By virtue of these core competencies, the firm is able to build the logistics ecosystem to achieve the goal of 'Improving Quality and Efficiency' by integrating and sharing resources with clients. The firm is now carrying out the program to build a logistics ecosystem, which is a technologically empowered platform for business transformation.

Third, the firm built its core competencies by applying new technologies in terms of block chain, big data, 5G, and internet to upgrade and transform the operation models. The action plan was to build an 'Intelligent Port Cluster', i.e., the 'Digital CMPorts' by establishing three specific platforms: the 'CM Chip' platform, the 'CM ePort' platform, and the 'Smart Operation Management' platform. The purpose of these platforms is to build up firm's critical capability of informationalized port operation and management to achieve 'Quality and Efficiency' the firm delivers to customers.

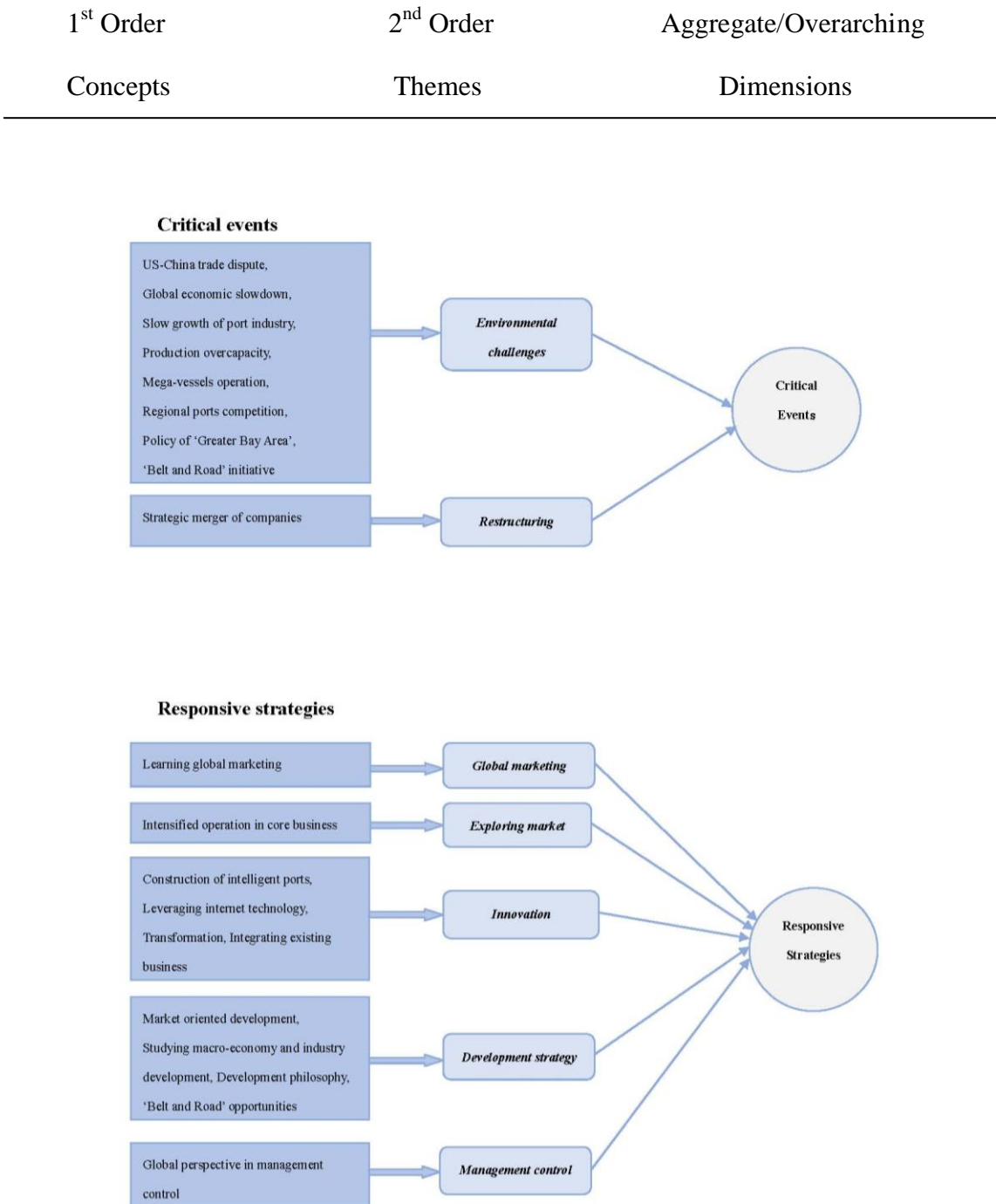
The interviewee, who is director in Marketing, indicated that the firm possessed core competencies in six areas: namely (1) management team, (2) marketing, (3) learning, (4) utilisation of resources, (5) application of advanced technologies, and (6) the development model of 'Port-Part-City'. This means that the firm has insights and

learning capabilities in these specific areas. The interviewee also viewed that core competencies of the firm were based on the natural endowments of the coastal lines for construction of ports and the benefited from the supports of government policies and funding as a SOE. Specifically, the firm possessed a unique geographical location adjoining to the vast area of cargo sources, serving the economic development in that area. First, the management team upheld the operational ideology of market orientation and the pragmatic strategy to align the development of ports with market conditions. As without the precise understanding of the market, the firm may lose valuable development opportunities; or the firm may stray from its development strategy. Second, the firm paid great attention to the building of a labor force with professional expertise. Third, the firm has profound foresights in application of advanced technologies, and it has plans to build ‘Intelligent Ports’ that facilitates the utilisation of different resources to enhance cooperation with clients.

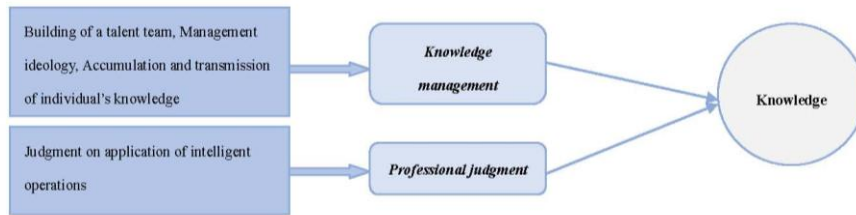
The data from the annual reports and the in-depth interviews suggested that the critical environmental factors affecting the operation and development of the firm are the global political and economic changes and market competition. However, development opportunities emerged from the domestic industry changes such as the supply side structure reform, the government’s ‘Belt and Road’ initiative, and the opening-up of the services sector to foreign enterprises. The firm’s core competencies were justified and embedded in two areas: (1) the firm’s successful operation and management, (2) the replication of the development model of ‘Port-Park-City’ in domestic and overseas port projects. The salient feature of the way the firm adopted to build its core competencies is the digital transformation in operation and management through the application of digital and information technologies. The results of the data analyses on transcripts and annual reports were presented in Figure 3 below and with

representative supporting data in Table 7 of Appendix 4.

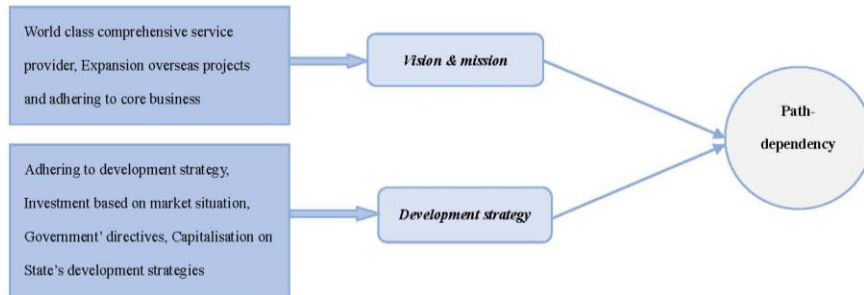
Figure 3 Combined Data Structure: Case 2



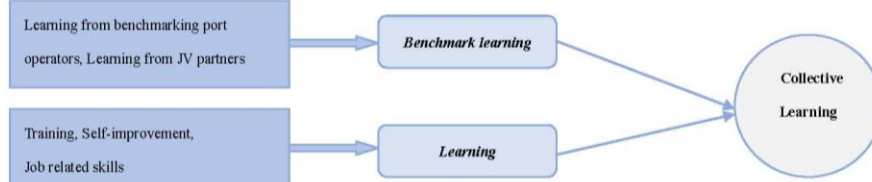
Knowledge



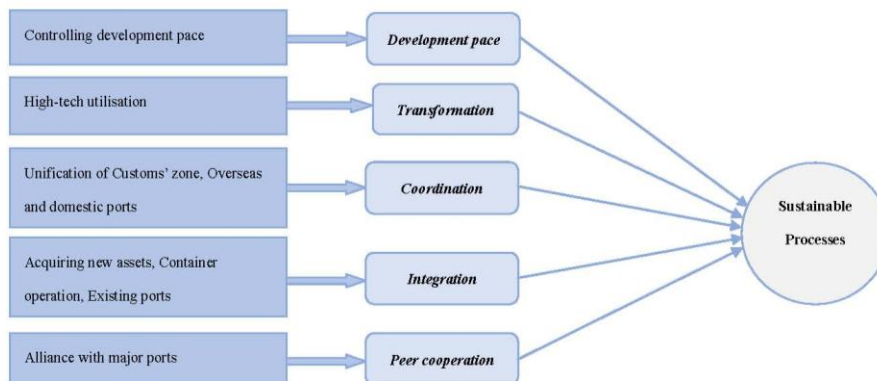
Path-dependency

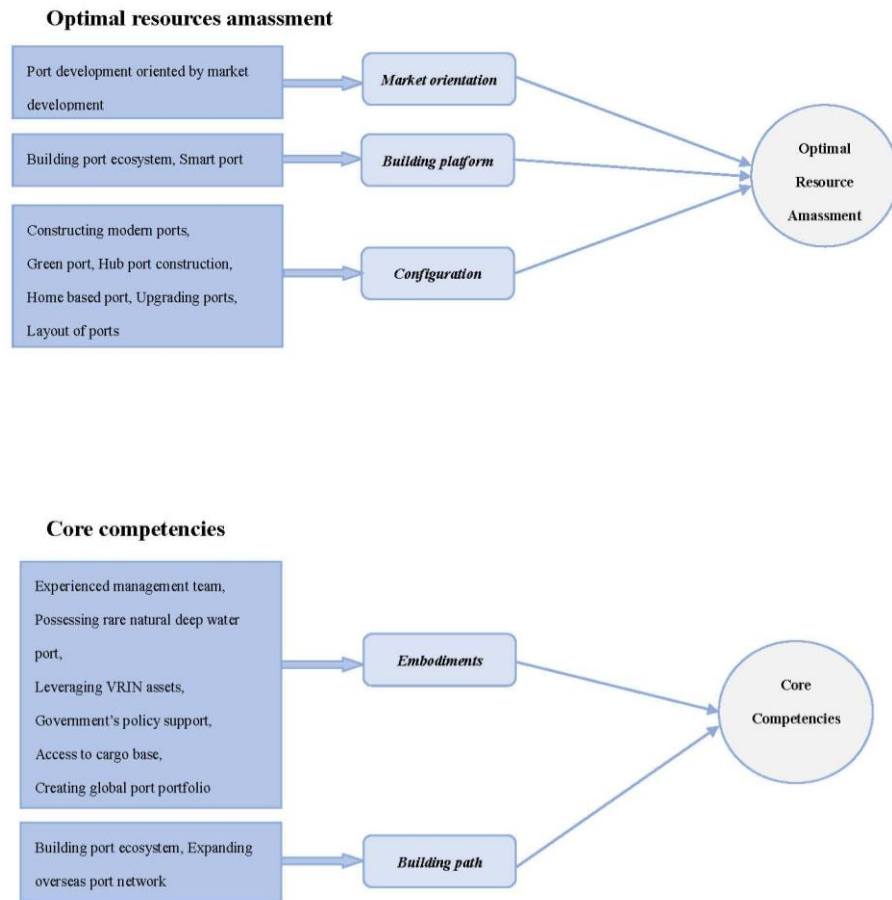


Collective learning



Sustainable processes





Individual case analysis Case 3

Case Company 3 identified environmental challenges and risks, and discussed its core competencies in sections of Chairman's Statement and Report of Directors in annual reports. Such challenges and risks were referred to as system risk, while those risks relating specifically to the company were referred to as non-system risks. The firm identified opportunities that avail the firm's development. In addition, the company exhibited its strengths and competencies, and it expounded its strategies for corporate development, operation, marketing, utilisation of resources, and investment. Further, it demonstrated its core competencies and the ways to build such core competence. Accordingly, the firm adopted concrete plans and measures to cope with complex

environmental challenges by building its core competencies. All these issues were addressed to different extent in annual reports.

First, the firm emphasized the system risks over the past five years, especially those global challenges such as US-China trade friction, anti-globalization, and Chinese Government's policies on prohibition of importation of industry wastes. On the one hand, the firm encountered other challenges due to the environment changes such as the development of Hong Kong-Zhuhai-Macau Bridge and the services of Guangdong and Hong Kong cross-border railway. These challenges severely changed the pattern of global trade and the shipping business of the company. On the other hand, the firm recognized overseas development opportunities and that in the 'Greater Bay Area' development in Guangdong, China. These favorable environmental changes provide opportunities to the company for overseas development and regional expansion by leveraging its business strengths and competitive edges supported by its resources base.

Second, the company viewed that its core competencies were reflected in four embodiments: (1) legitimate representation in Hong Kong for local shipping operators in the Pearl River Delta area, (2) knowledge about the shipping industry between Hong Kong and Guangdong, China, (3) knowledge of identifying the desirable assets, and, (4) efficient integration and leveraging of operating resources. The firm asserted that these core competencies were supported by assets with the attributes of VRIN, the sound industry chain, supply chain, and the appropriate resources base accumulated over years.

Third, in order to adapt to the business environmental changes and tide over difficult

times, the firm developed four strategies with action plans: (1) transforming business by exploring and entering new business domains, (2) enhancing production efficiency by upgrading and integrating existing assets, (3) reorganizing operation and management systems, (4) carrying out overseas investments. The business transformation includes changes in terms of business models, alteration or upgrading of the production features of assets, and new ways of integrating existing resources. The concrete action plans included entering the airfreight logistics business, engaging local ferry and tours business in Hong Kong, and improving X-ray inspection machines for air cargo for Hong Kong International Airport. The plan also includes reorganization of the marketing network with integration of existing ports and warehouse resources in the Pearl River Delta in Guangdong, China.

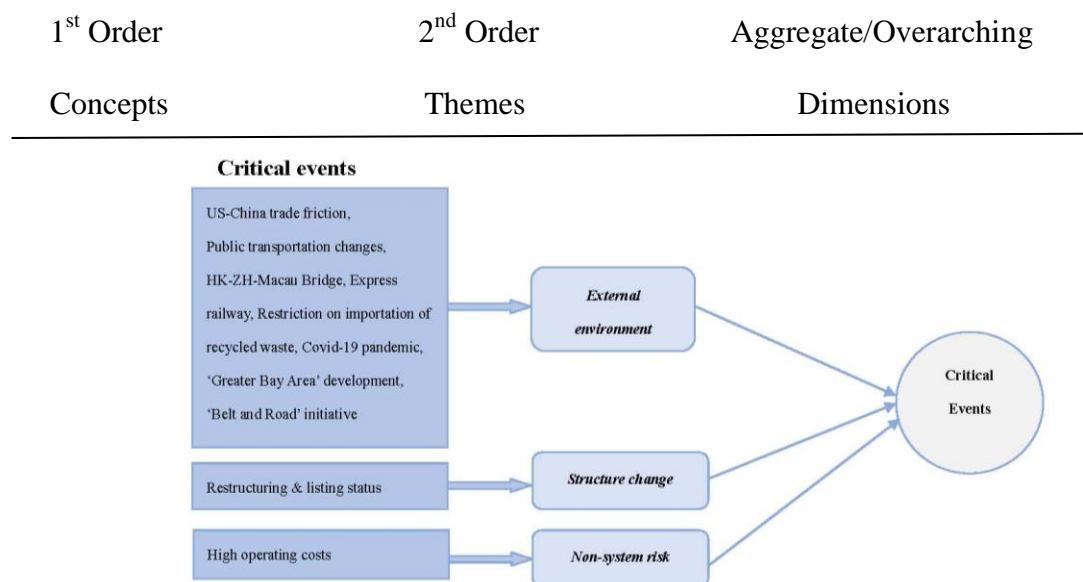
Three senior executives were interviewed through WeChat. Regarding the questions of the definition of core competencies and the ways to build such competencies, these interviewees had different views. Interviewee 1, the Managing Director, defined core competencies as the unique capability of sustainable operation of a firm. He asserted that for building core competencies, the critical factors are to acquire the unique assets with the attributes of VRIN, and to gain dominate industry position. He argued that unique assets were the prerequisites to generate core competencies and to generate business. He also viewed that the core competencies of the firm were to deal with the adjustment and transformation of business and the proper relocation of resources. Interviewee 2, Director for Corporate Development, regarded core competencies as the combination of the experienced management team and the possessed or controlled core resources on every link of the industry chain. It means that core competence is the combination of an experienced team and a sound industry chain. He asserted that heavy asset investment is a high hurdle for late comers; therefore, it helps the

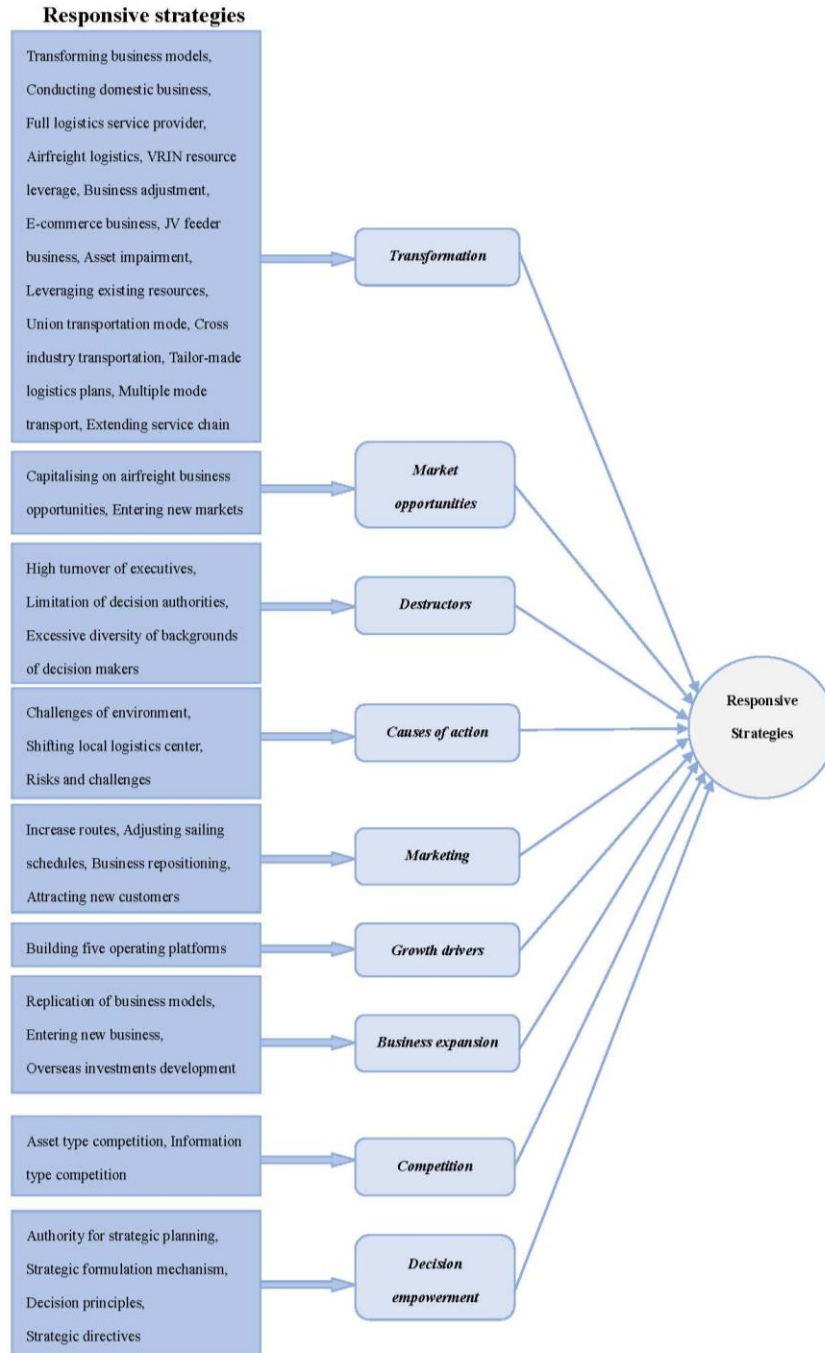
dominating firm to maintain its competitive industry position. Interviewee 3, Chief Investment Officer, held the view that core competence means the unique capabilities to represent the interests of clients, to coordinate with Government authorities, and to maintain an effective and efficient management and operation system. These core competencies were secured because of the unique assets possessed by the firm, the Government support, and the inherited management capabilities. Further, Interviewee 3 discovered four types of core competencies based on his observations on the development pattern of the firm and the industry. These four types of core competencies were the resources-based core competencies, operational-based core competencies, management-based core competencies, and intellectual-based core competencies. These core competencies were developed at different stages of the firm or the industry. Interviewee 3 held the view that the core competencies of the company belong to resources-based core competencies.

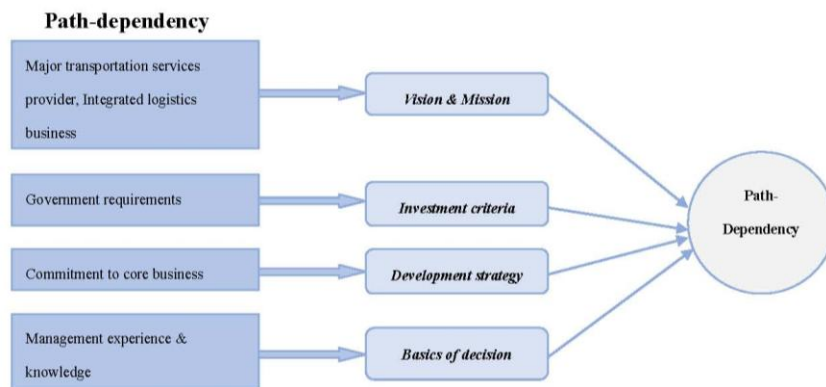
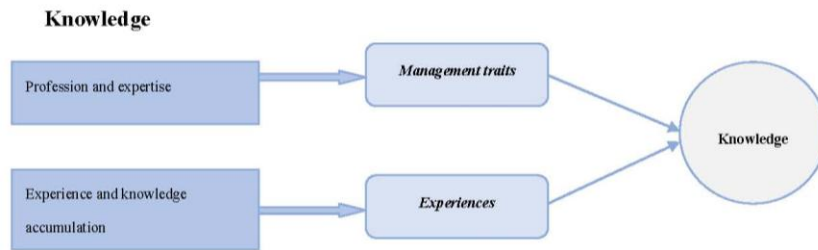
Data in annual reports and in-depth interviews are complementary. From the reports and the interviews, data generally addressed the importance of core assets possessed or controlled by the firm that contribute to the building of core competencies. The data also ascertained the importance of the efficient utilisation of resources in such process. All three interviewees mentioned three issues: the importance of core assets, the management capability, and the ways to utilise resources. Interviewees suggested that core competence means a superior capability that is unreachable by rivals or peers in the industry, which is based on the capability of controlling VRIN resources and the effective and efficient marketing network. They pointed out that the building of core competencies includes the possession of resources with VRIN attributes, the capabilities in integration resources, the cooperation in marketing, and the operating networks, which are the paths to build core competencies. The purpose of acquiring

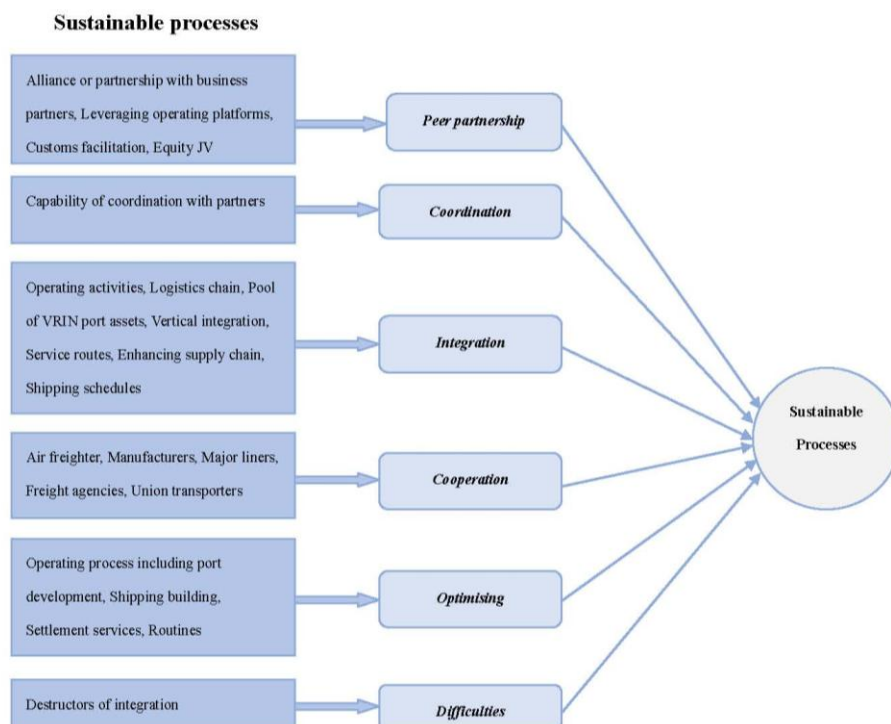
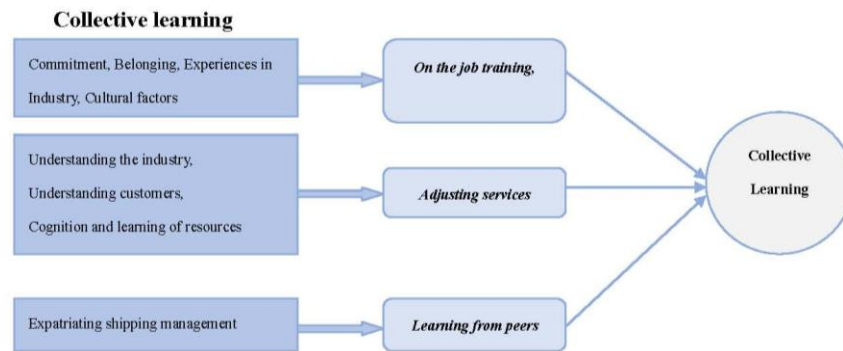
VRIN assets is to satisfy the needs of production conditions and to create market barriers. Integration means to utilise existing resources, and the cooperation refers to commitment of the marketing strategies and efforts across the company. In other words, the process of building core competencies includes acquiring core assets with attributes of VRIN and the utilisation of resources with the interaction of management capability. The combined results of data analyses of Case 3 are presented in Figure 4 below and with representative supporting data in Table 8 of Appendix 4.

Figure 4 Combined Data Structure: Case 3

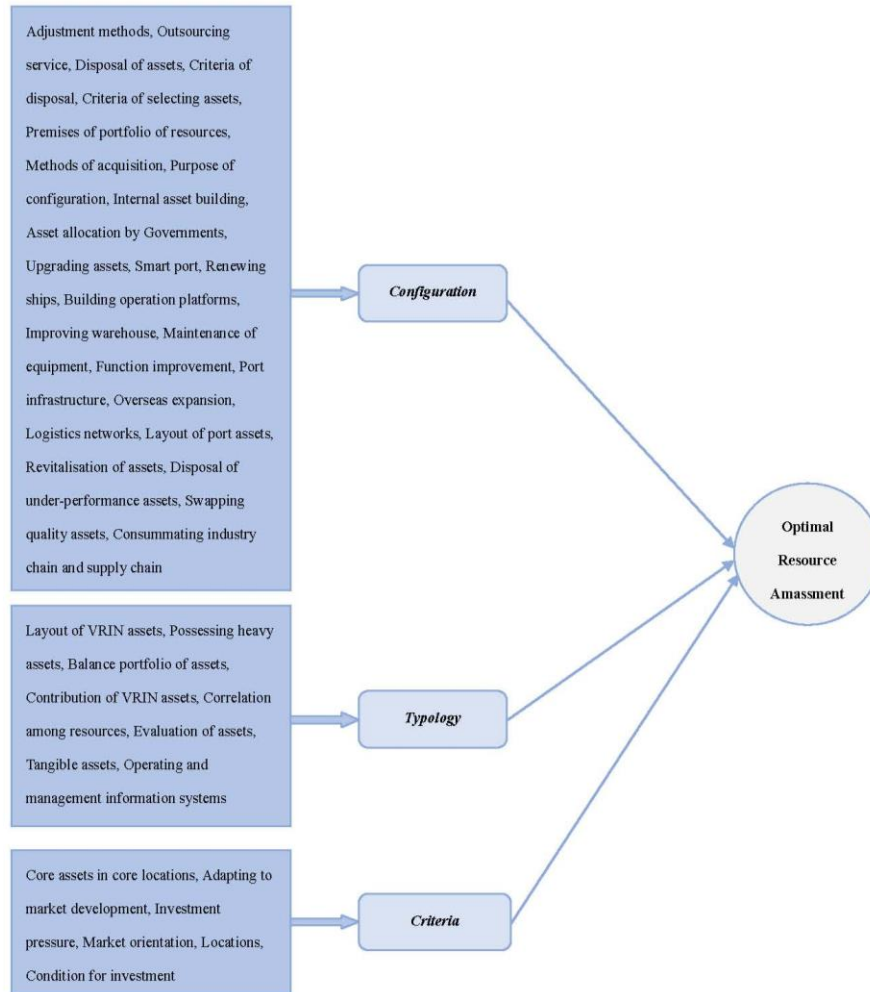


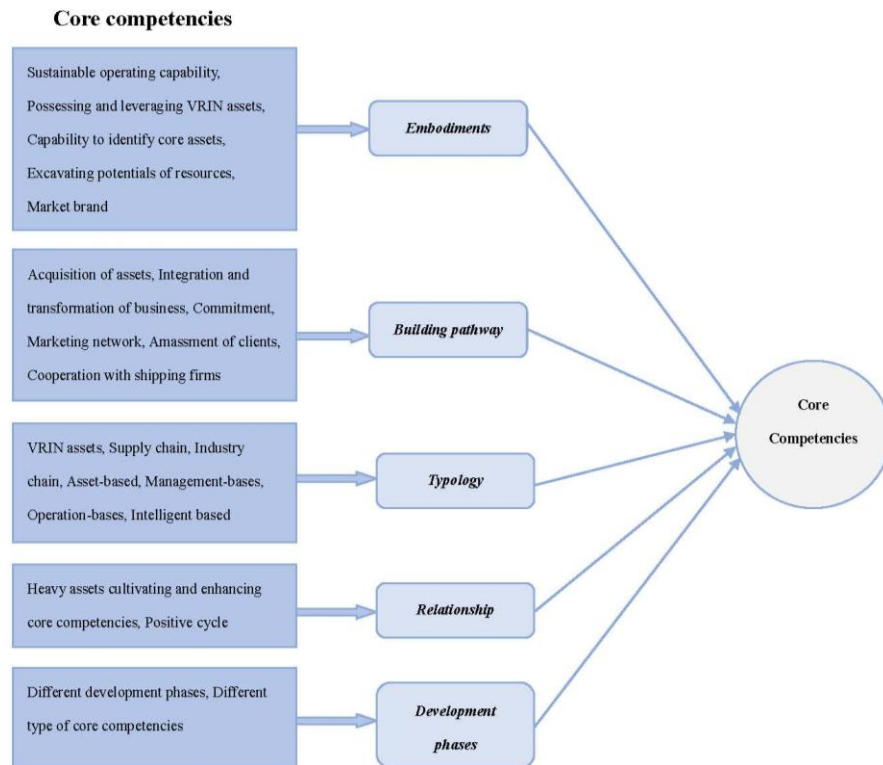






Optimal resources amassment





Individual case analysis: Case 4

Case Company 4 discussed the business models, critical events, core competencies, and operating results in the section of Business Summary and the section of Discussion and Analysis of Operation Performance in annual reports over the last three years. The company affirmed that the global environment was complex and austere over the past years, while domestic economic development was transforming to optimize the reform of the economic structure. In the last ten years, the main development trend of the domestic logistics industry was the integration of port resources that facilitates the cooperation of port enterprises. In addition, the traditional form of competition for cargo quantity among port enterprises has now turned to the form to compete in terms of services, efficiency, and cost effectiveness.

First, the company recognized three critical factors that affect its operations: the complex global trade situation, the US-China trade friction, and the slow down domestic economic development. In addition, the company identified four development opportunities: China's 'Belt and Road' initiative, the 'Greater Bay Area' development, the project of building 'Guangzhou international shipping hub', and the development of Nansha Free Trade Zone. Specifically, the company aims to develop into an integrated international shipping hub in PRD and in southern China. The company believed that the development trends of the logistics industry were the mega-ship operation, the integration of port resources, and the digital transformation in the industry.

Second, the company has sustained core competencies in three business domains: (1) the function as the regional shipping hub, (2) terminal operation as an integrated services provider, (3) construction and management of port projects as the reformer.

The company has closely cooperated with major international shipping enterprises among the top 20 shipping lines in the world, and it serves more than 100 international container-shipping routes. It transships cargos from more than 400 foreign ports in more than 100 countries. As the integrated terminal operator, the firm operates with a unified platform that provides services of cargo handling, storage, logistics, ship towing, cargo tallying, finance, and trade. With core competencies in port construction and management, the firm aims to become the ‘world-class big port, and serving the world’, while upgrading terminal infrastructure to accommodate mega-ship operations. These core competencies were supported by its three advantages: (1) geographical locations of the port, (2) Government policies support, (3) vast cargo base. First, the port situates at the advantageous geographical location in the Pearl River waterway network, and it is adjacent to deep-water ports. The port had seamless connections with the national railway system, expressway system, airfreight, and river transportation. Second, the role as an international shipping hub was supported by favorable government policies in terms of free trade zones. Third, the vast cargo base covered seven provinces in China, generating stable cargo sources for port business.

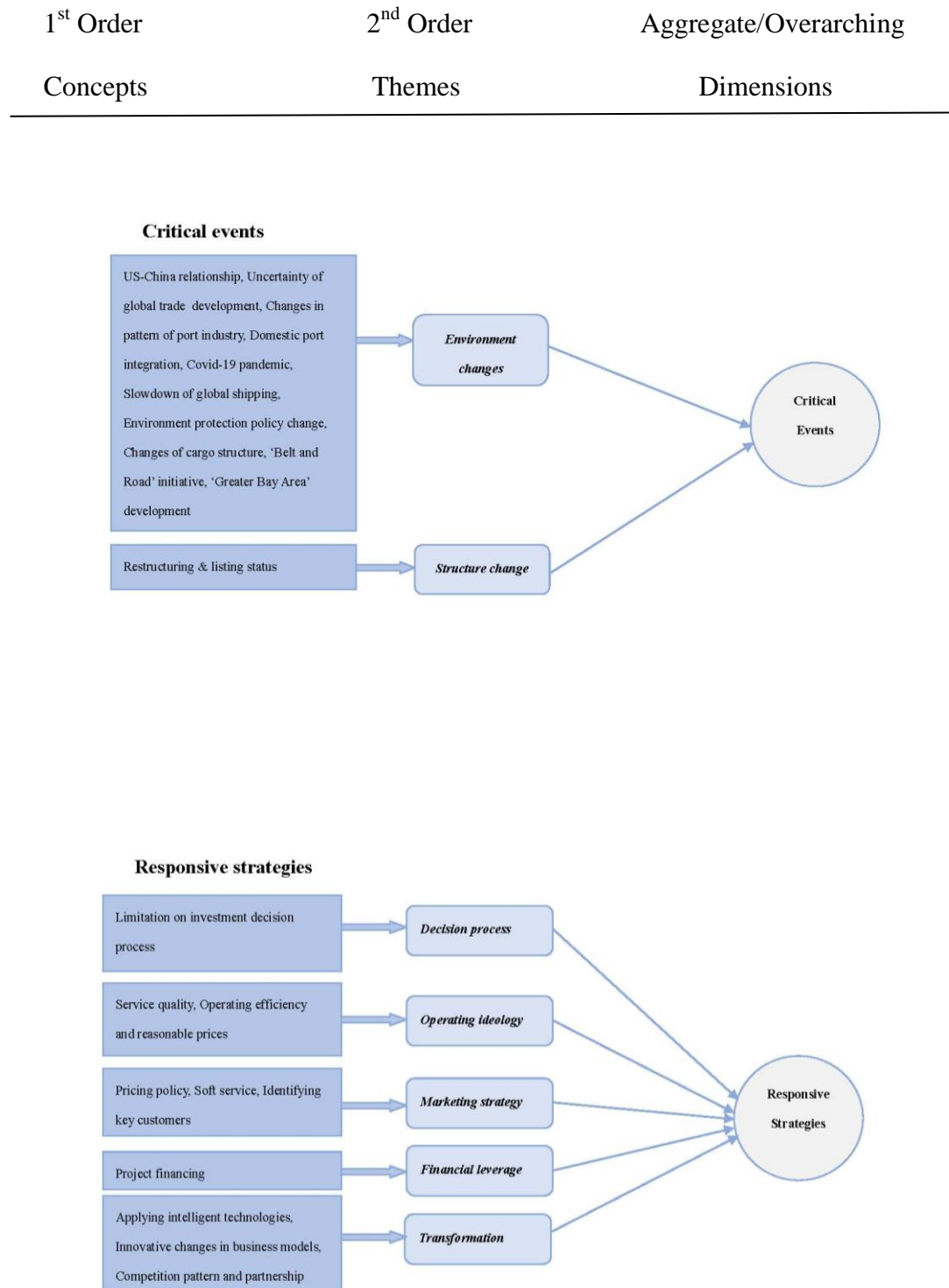
Third, the company enhanced its core competencies by establishing JV relationships with cargo owners, shipping companies, and logistics enterprises. In addition, the company launched the plan to build ‘Intelligent Ports’ through building four digital platforms: (1) the ‘Customs and Port’ platform, (2) the ‘Marine Data Sharing and Anchorage’ platform, (3) the ‘Container Logistics Information Sharing’ platform, and (4) the ‘Nansha Tractors’ platform. This informationalized infrastructure formed the solid basis for building core competencies in terms of providing an integrated business platform. Further, the company increased production capacity by enlarging

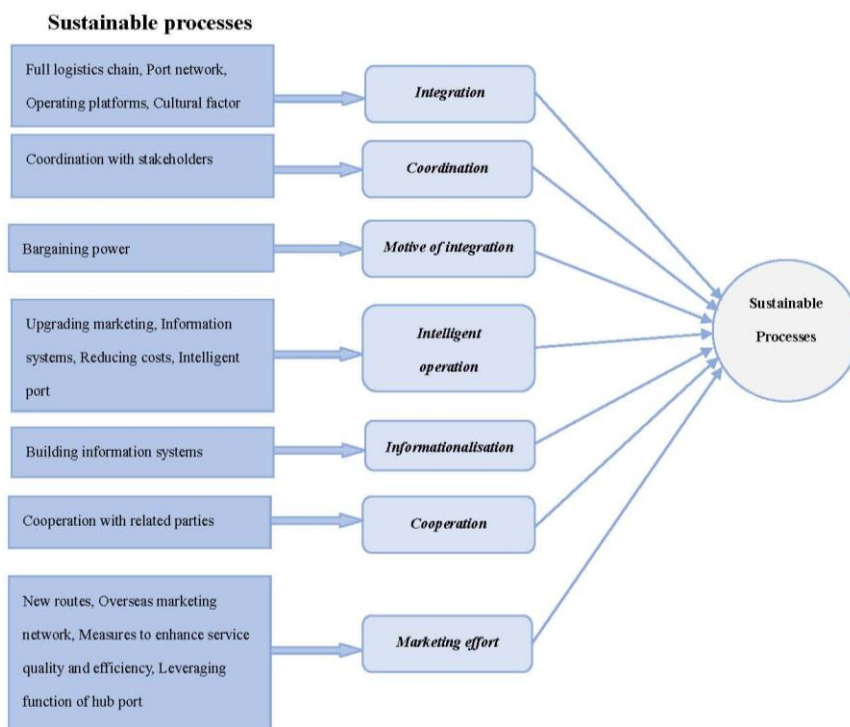
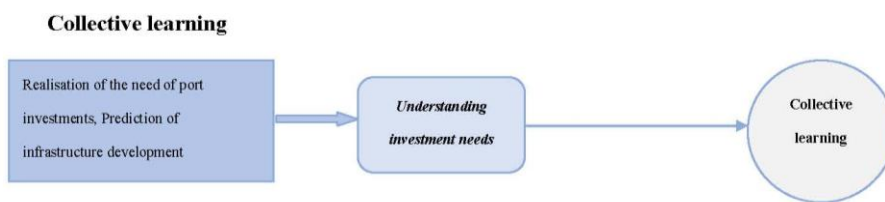
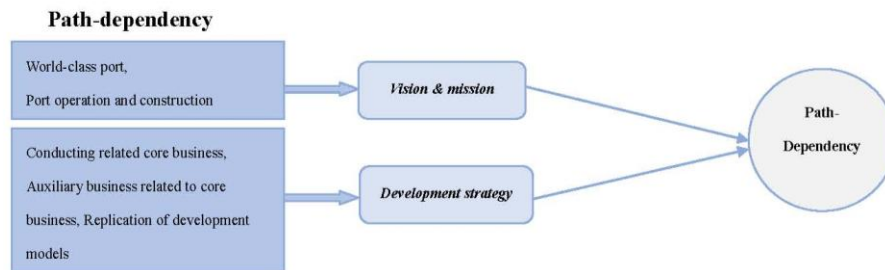
terminal spaces to accommodate mega-ship operations. Furthermore, the company extended business to upstream and downstream of its supply chain, and explored new comprehensive logistics service based on its core competencies.

During the in-depth interview, the interviewee touched on the key issues. Such issues include identification of clients, business models, cognition about the format of the industry, common issues of the industry such as 'price, quality, and efficiency', carriers of core competencies, and the ways to build core competencies. Specifically, the interviewee claimed that the company possessed three core competencies. First, the company has the capability to provide clients with quality and efficient services through informationalized platforms. Second, it has the capability in effective utilisation of assets such as the cargo handling plant and equipment, and warehouses. Third, the firm has the capability in identifying right locations with VRIN attributes, and it has the knowledge and experiences on construction of terminals.

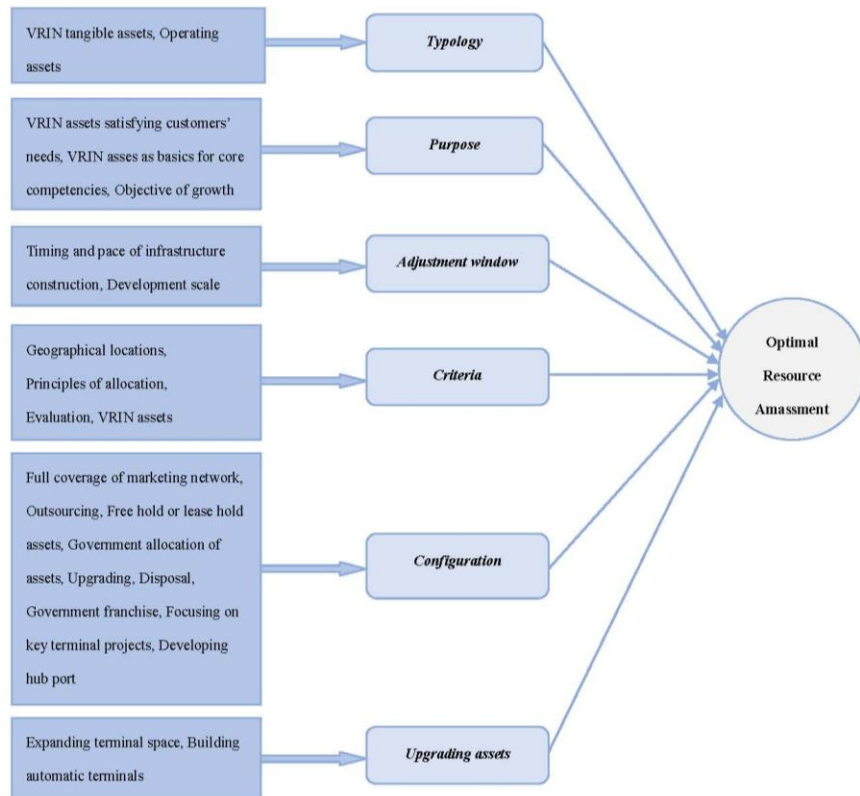
The annual reports reviewed the operation and management activities, the achievements, and the development strategies. These annual reports mentioned the importance of the geographical location of the port in terms of its connections to other transportation systems. The location connects to ocean shipping routes, the domestic railway system, the expressways, and the vast base of cargo resources. In addition, the interviewee addressed the importance of the quality and efficiency of services. The data from the annual reports and the transcripts revealed that the core competencies of the company were embedded in production, marketing, utilisation and augmentation of assets, and the application of technologies. The combined results were presented in Figure 5 below and the representative supporting data in Table 9 of Appendix 4.

Figure 5 Combined Data Structure: Case 4

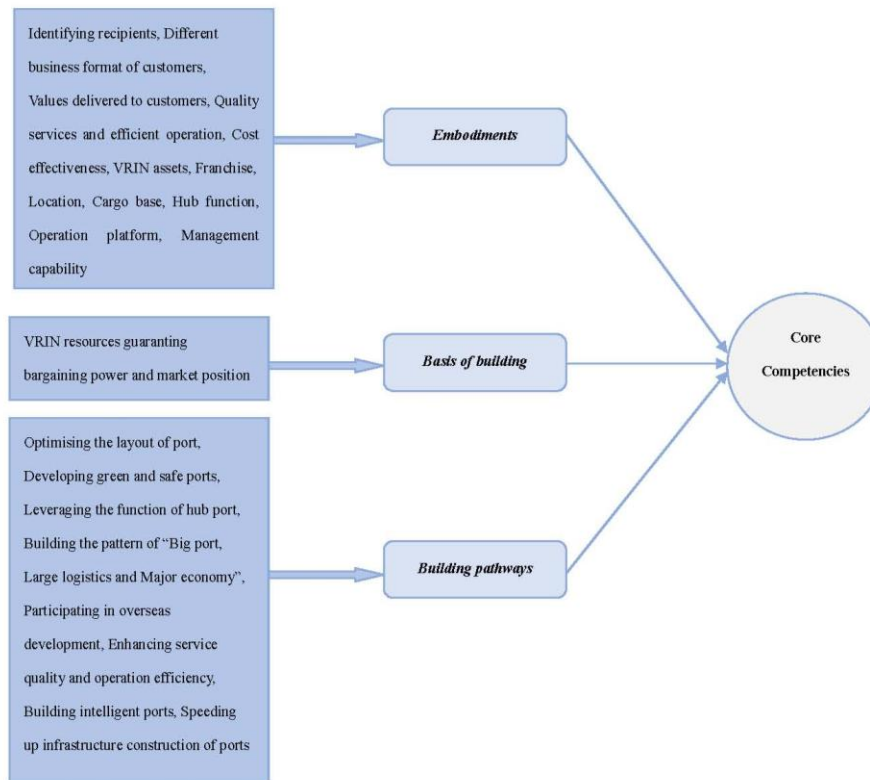




Optimal resources amassment



Core competencies



Individual case analysis: Case 5

Case Company 5 addressed its core competencies in the sections of Industry Development Situation, Core Competencies Analysis, Core Business Analysis, and Confronting Risks and Response Measures in the annual reports. In these reports, the firm identified the global environmental risks and challenges, the development opportunities, the firm's core competencies, the paths to build such core competencies, and the consummation of the layout of its port resources. In addition, the company envisioned responsive measures to cope with risks, and to tide over difficulties by revealing development strategies and action plans. Such measures include capital construction of terminals and the replication of its development model of 'One City-One Port-One Host' in new investment projects in China.

First, the company observed four main risks and challenges: the US-China trade friction, the uncertainty of the global economy, the competition between port operators, and the Covid-19 pandemic. The company identified development opportunities arising from China's 'Belt and Road' initiative, the development of 'Greater Bay Area', and the development in Yangtzi River economic development zone, in China. The firm also perceived two main development trends: the integration of ports in China (the purpose of this plan is to optimize operative efficiency of port resources) and the digital transformation of the port industry. These environmental challenges have severely affected the operation and the development of the company. Accordingly, the company shifted part of its business to domestic development to capitalize on the opportunities in the 'Greater Bay Area' development, and the Yangtze River area development in China. Recently, the company completed two major port investments, one in the 'Greater Bay Area', and the other in Yangtze River area. The firm had developed plans to upgrade and transform port operations with

digital technologies, and it built such new ports as the benchmark port operations in those areas.

Second, the company's core competencies were reflected in three areas: (1) its distinct corporate brand, (2) the operation and management efficiency, (3) the productive capability to accommodate international mega-ship operations. Specifically, the firm operates the largest single port in the world, and it works closely with well-known international port operators and shipping firms, providing the best choice for customers in terms of shipping routes and schedules. The company adheres to the operating philosophy of pursuing 'quality and efficiency' for its customers. In addition, the firm occupied the rare geographical location for port operation in terms of deep-water berths and the cargo base adjoining to the most developed economic area in China. This advantage secures firm's sustainable growth.

Third, the company asserted that these core competencies were created by a successful partnership and the Government's franchise to build and operate the port. By virtue of the close cooperation through equity joint venture with a well-known international port operator, the company was able to adopt, assimilate, and accommodate successful management systems and operation practice, becoming a benchmark port operator in China. In addition, its core competencies were enhanced by the replication of its successful development model of 'One Port-One City-One Host' in other places for expanding business in China. Currently, the company is conducting two port development projects for the purpose to consummate its layout of ports and its business structure. These new ports will be built into integrated modern ports equipped with informationalized technologies to handle bulk, general, and container cargos. The company enjoys the privilege by Government's grant to

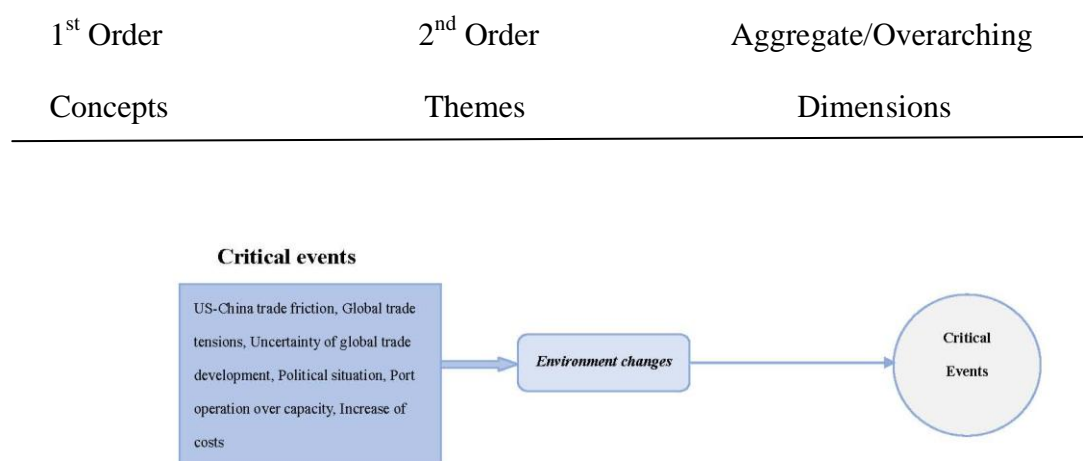
construct and operate the terminals.

The interviewee held the view that core competencies mean franchised operation by the local Government, and such franchise is a type of policy resource the firm possessed. The purpose to adopt the equity JV cooperation was to gain benefits for both partners because the foreign partner had the expertise and experiences from abroad, and the domestic partner possessed the geographical resources and the cargo resources for business. This successful cooperation established an efficient development model as a result, and it went through a learning process. The interviewee suggested that there were two issues about core competencies: the cognition level and the process level. Where the first level was about the cognition of the need to cooperate with an advanced port operator, and the second level was the process concerning whether such cognition could be realized. The firm had successfully gone through the process, and became a distinct port operator in the world. The interviewee deemed that 'quality and efficiency' are the key factors that best demonstrated the success of the firm because these two objectives are the values that customers shall pursue. However, achieving 'quality and efficiency' requires effective and efficiency utilisation of terminal operation equipment and facilities. Therefore, the efficient utilisation of operating assets is also an important factor to the success of operation, and the performance of the utilisation of assets can be evaluated by using financial techniques such as ROA ratio. The interviewee acknowledged that a positive correlation among the performances of different assets determined the synergy of the resource base of the firm. Accordingly, investment projects should be complementary to each other.

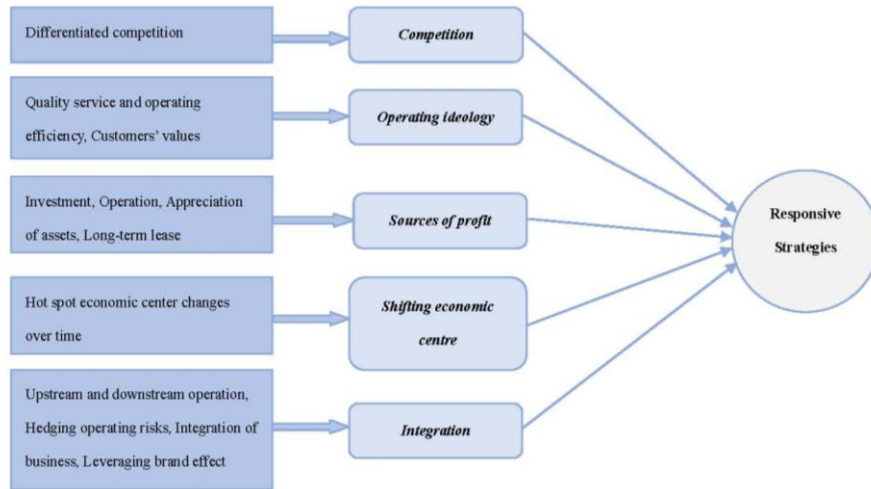
Annual reports and the transcripts confirmed that the core competencies of the

company were the capability to provide satisfactory services and efficient operation, and the capability to accommodate mega-ship operations with more shipping routes and calls. Such data also showed that the success of the firm was attributed to two key factors: (1) a good business partner, (2) the Government franchise to build and operate the port. The annual reports expounded the investment activities with the replication of its development model in China. Further, the interviewee justified the JV cooperation with a benchmark business partner from abroad. Thus, core competencies of the company can be enhanced by new investments, upgrading and transforming terminals. The company acquired new ports to consummate its layout of ports, and to upgrade such ports with informationalized technologies. The firm entered into new business areas, e.g., domestic trade for bulk, general, and container cargoes. The combined results of the data analyses are presented in Figure 6 below and with representative supporting data in Table 10 of Appendix 4.

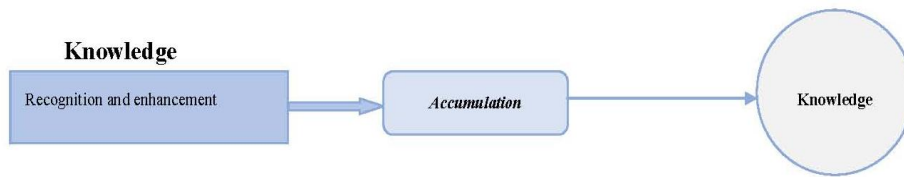
Figure 6 Combined Data Structure: Case 5



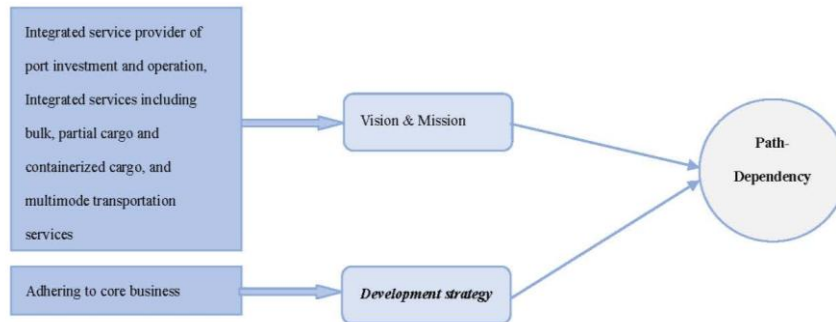
Responsive strategies

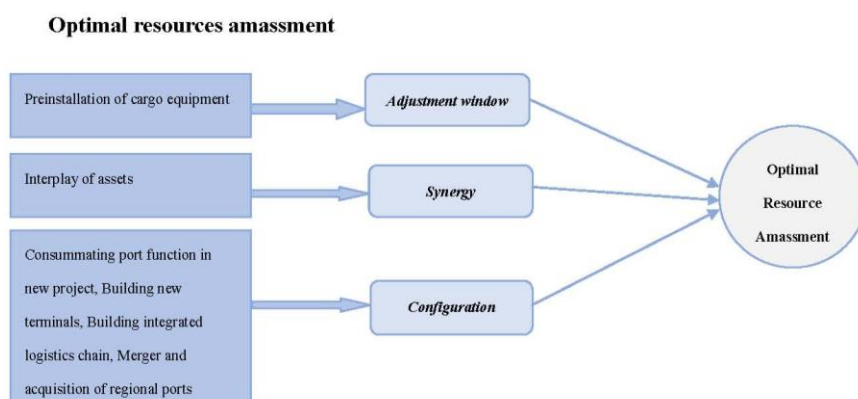
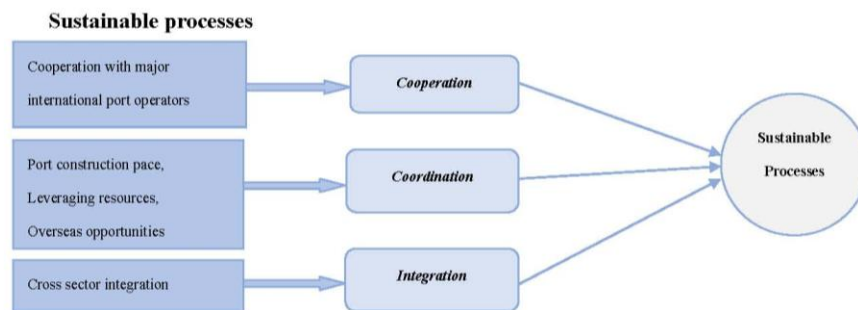
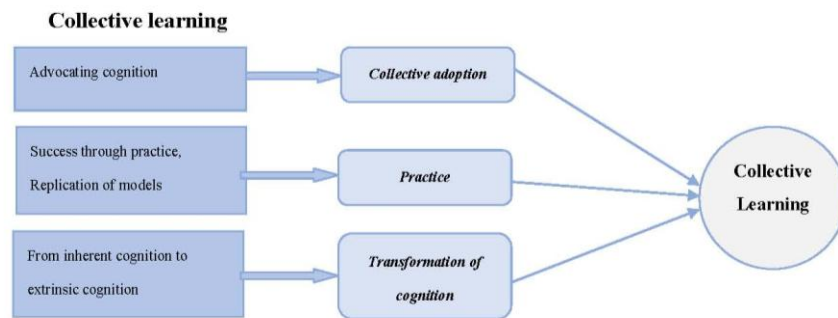


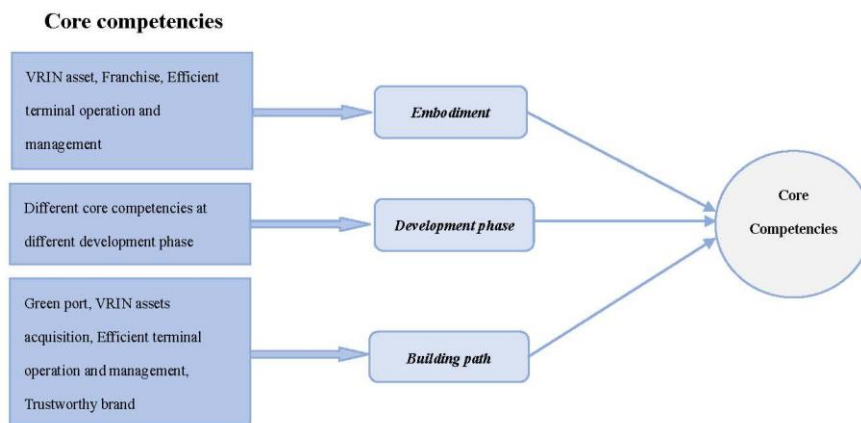
Knowledge



Path-dependency







Individual case analysis: Case 6

Case Company 6 is an industry association established by local port operators in Shenzhen in 1990. It is a non-profit making institution. The interviewee stressed four issues: the layout of ports in Shenzhen, Shenzhen port's position in port industry of the world, the cause of the success of the port industry, and the development trends of the industry. Specifically, the interviewee accounted for the layout of ports in Shenzhen where two major port enterprises operate in the area: one is located in the western part and the other in the eastern part. There are other major foreign JV terminal operators in the area. In 2020, the port industry in Shenzhen ranked No.4 in the world in terms of container throughput after Shanghai and Ningbo in China, and Singapore. The interviewee held the view that one effective way to build up core competence is to learn from a benchmark port operator, which is the most advanced firm in the world. For example, one of the major port operators in Shenzhen gained its core competencies through equity joint venture with a world-class port enterprise, whereby the local firm learned, adopted, and assimilated the operating ideology, management institutions, and business practice. The local firm became the single largest port in the world in terms of container throughput in 2016. The partnership enabled the local firm to get involved in logistics supply chain in a global context by providing more than 100 international shipping routes for more than 40 international major shipping lines. The core competencies of the company were the cognition to learn from partners, and the commitment to practice. The company possessed the most valuable resources of deep-water terminals with a draft of more than 15 meters that can accommodate global mega-ships operations. Based on these core competencies and the physical conditions, the firm was blended in the supply chain with global partners.

In addition, the interviewee perceived two salient trends in the development of port industry in the area: the integration of port resources and the informationalized transformation of port operations. The integration of ports among SOEs in the area was encouraged by the local Government for the purpose to avoid competition among SOEs. The second trend is the upgrading of port operations, which is apparent in practice, as one port will become an automatic port with intelligent operations in 2021. The interviewee provided insights on the building of core competencies and the foresights on the development trends of the port industry. The results of data analyses were combined with those of Case 7 and Case 8, and such results were presented in Figure 7 with representative supporting data in Table 11 of Appendix 4.

Individual case analysis: Case 7

Case Company 7 is an industry association established by port operators in Guangdong in 1984. It is a non-profit making institution. Regarding the building of core competencies of the port industry, the interviewee focused on three issues: the function of a hub port, the core competencies of a hub port, and the development trends of the port industry in Guangdong, China. First, the interviewee explained the concept of port logistics in that the port industry is an important link in the logistics industry chain. A major port functions as a hub for integrated transportation with switch functions of different transportation modes, and it is also an information centre and a service centre. With high-end port services, a major port usually connects to railway, road, and airfreight systems, forming a large pattern of transportation.

Second, the building of core competencies of port industry should be considered for enhancing the efficiency of the functions as a port. Specifically, the core competencies of a port are embedded in the capability to function as a smooth and safe switch centre

for different mode of transportation with a balanced match of services quality, efficiency and costs. Such core competencies are also reflected in the capability to provide clients with modern informationalized services in shipping consignments and transportation. Such capability is characterized by the application of block chain technology in documentation that enabled the sharing of information from different participants or regulatory authorities. Therefore, the building of core competencies of a port should be based on the informationalized transformation. One of the key issues to build core competencies is the availability of talents who possessed the capabilities of cognition, learning, and operating ideology in relation to the port industry. The interviewee held that a kind of ideology determined the cognition on new things, in turn, determined the action to learn.

Third, the interviewee pointed out two development trends in port industry, the integration of Chinese ports and the informationalized transformation in logistics industry. The integration of domestic ports is due to the overlapping construction and cutthroat competition among port operators, especially in the Pearl River Delta in Guangdong, China. After the integration, port resources will be reorganized for differentiated development. The second trend of transformation is because of the Government policy to establish two international shipping hubs, the Guangzhou hub, and Shenzhen hub. These two trends occurred because of the environmental changes of the US-China trade friction, the complex and turbulent global economic changes, and the geopolitical tensions over the past years. The interviewee pointed out that ports in these two shipping hubs will transform into modern ports providing integrated logistics services with informationalized operations. The results of the data analyses were combined with those of Case 6 and Case 8, and such results were presented in Figure 7 with representative supporting data in Table 11 of Appendix 4.

Individual case analysis: Case 8

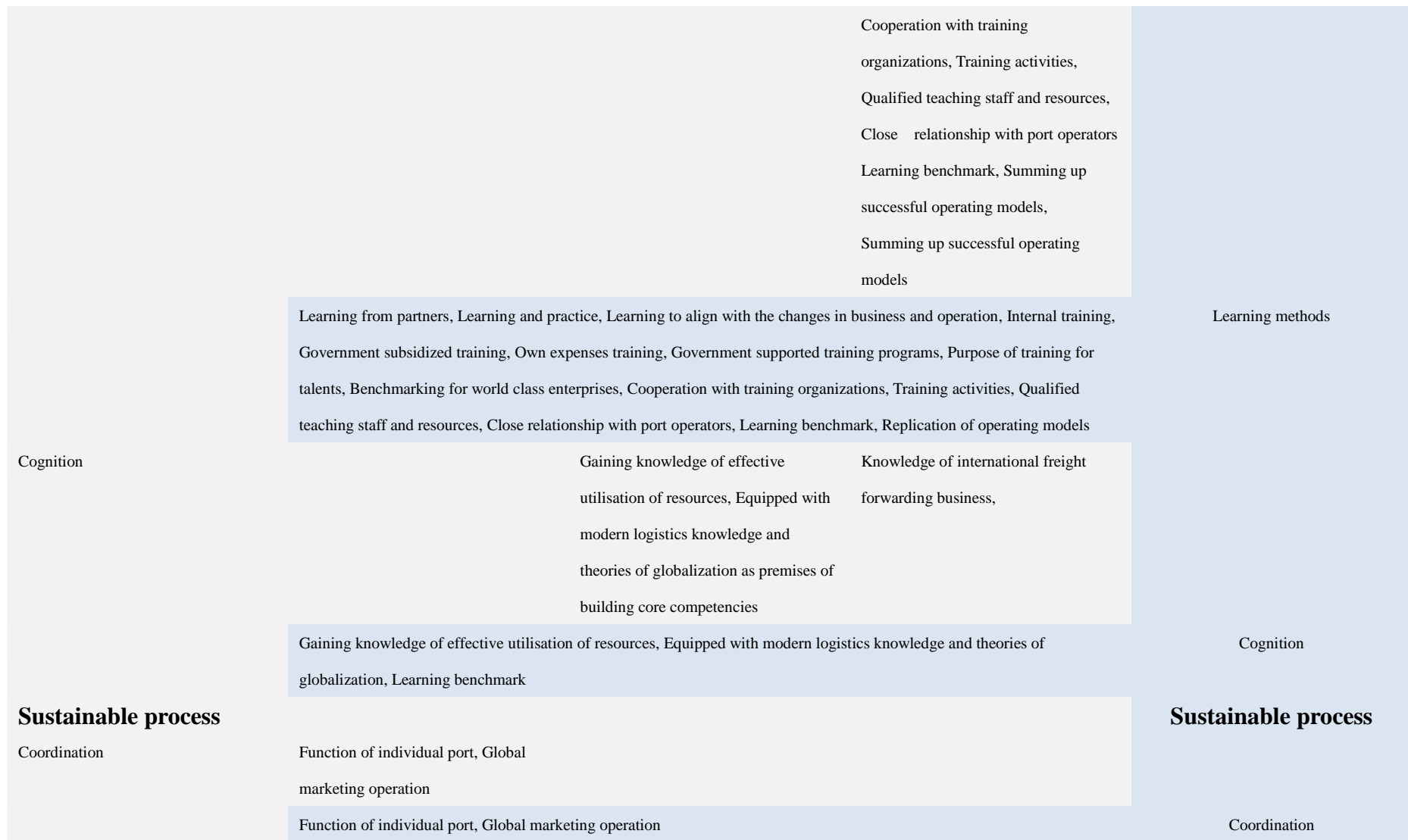
Case Company 8 is a vocational training centre established in Shenzhen in 1996. Its mission is to train logistics practitioners. During the investigation, the interviewee elaborated on the role and the history of the logistics industry in Shenzhen, the training programs for logistics practitioners, Government supports, and the development trend of informationalized transformation of the industry. The interviewee pointed out that Shenzhen is the starting point in the development of ‘Greater Bay Area’, where it is one of the most promising economic development areas under the national development strategy. The interviewee mentioned that the port industry in Shenzhen started in the early 1980’s, and it was ranked No. 4 in the world in terms of container traffic in 2020. He pointed out that one of the reasons of the success of the port industry in Shenzhen was the industry efforts and the Government support for training logistics practitioners. The graduates of the training centre were employed by local logistics enterprises and firms in other places in China. Supported by the Shenzhen Government and other local logistics enterprises, the centre organized the international logistics exhibition every year. Such exhibition was ranked No.2 in the world and No.1 in Asia. The main features of the training programs were to equip trainees with knowledge and skills to build intelligent port, intelligent logistics, and the use of the internet. The interviewee observed two development trends in the industry: the importance of cultivation of talents and the transformation of an intelligent logistics industry. By virtue of these changes, the logistic industry in Shenzhen will become the benchmark logistics industry with a high ranking worldwide. The results of the data analyses were combined with Case 6 and Case 7, and were presented in Figure 7 with representative supporting data in Table 11 of Appendix 4.

Since these three Case Companies 6, 7 and 8 are industry associations, and they are different from those five port operators in terms of business and operation; the results of the analyses are combined into one table. The purpose of the combination is to obtain the consolidated views of interviewees representing the industry for the research questions, especially for the questions of building core competencies regarding port industry in China. The combined results of the analyses are presented in Table 3 below.

Table 3 Combined results of data analysis: Case 6, Case 7 and Case 8

Case (Industry Association)	Case 6	Case 7	Case 8	Combined results of industry associations
Dimensions & Themes	Concepts	Concepts	Concepts	Dimensions, Themes & Concepts
Critical event				Critical event
Environmental challenges		Globalization, International trade tensions, Uncertainties of Sino-US relationship, Integration of port industry, Covid-19 pandemic		
	Globalization, International trade tensions, Uncertainties of Sino-US relationship, Integration of port industry, Covid-19 pandemic			Environmental challenges
Responsive strategy				Responsive strategy
Operating ideology	Centric profitability			
	Centric profitability			Operating ideology
Global marketing	Global marketing approach		World standards of port operation, Industry position	
	Global marketing approach, World standards of port operation, Industry position			Global marketing
Transformation	Upgrading role of ports	Building international shipping hub, Transformation of intelligent operation, Expanding international business	Application of intelligent technologies	

	activities	
	Upgrading roles of ports, Building international shipping hub, Transformation of intelligent operation, Expanding international business activities, Application of intelligent technologies	Transformation
Development opportunities	‘Greater Bay Area’ development, ‘Belt and Road’ initiative	
	“Greater Bay Area’ development’, ‘Belt and Road’ initiative	Development opportunities
Knowledge		Knowledge
Experience	Improved port management capability through learning, Awareness of legal protection	
	Cognition of informationalized, To be strong, but not to be big.	
	Improved port management capability through learning, Understanding logistics industry	Experience
Path-dependency		Path-dependency
Vision & mission	SOE social responsibility	
	SOE social responsibility	Vision & mission
Collective learning		Collective learning
Learning methods	Learning from partners, Learning and practice, Learning to align with the changes in business and operation	Mission of training, Training methods: internal training, government subsidized training, own expenses, Government supported training programs, Purpose of training for talents, Benchmarking for world class enterprises, Sources of trainees,

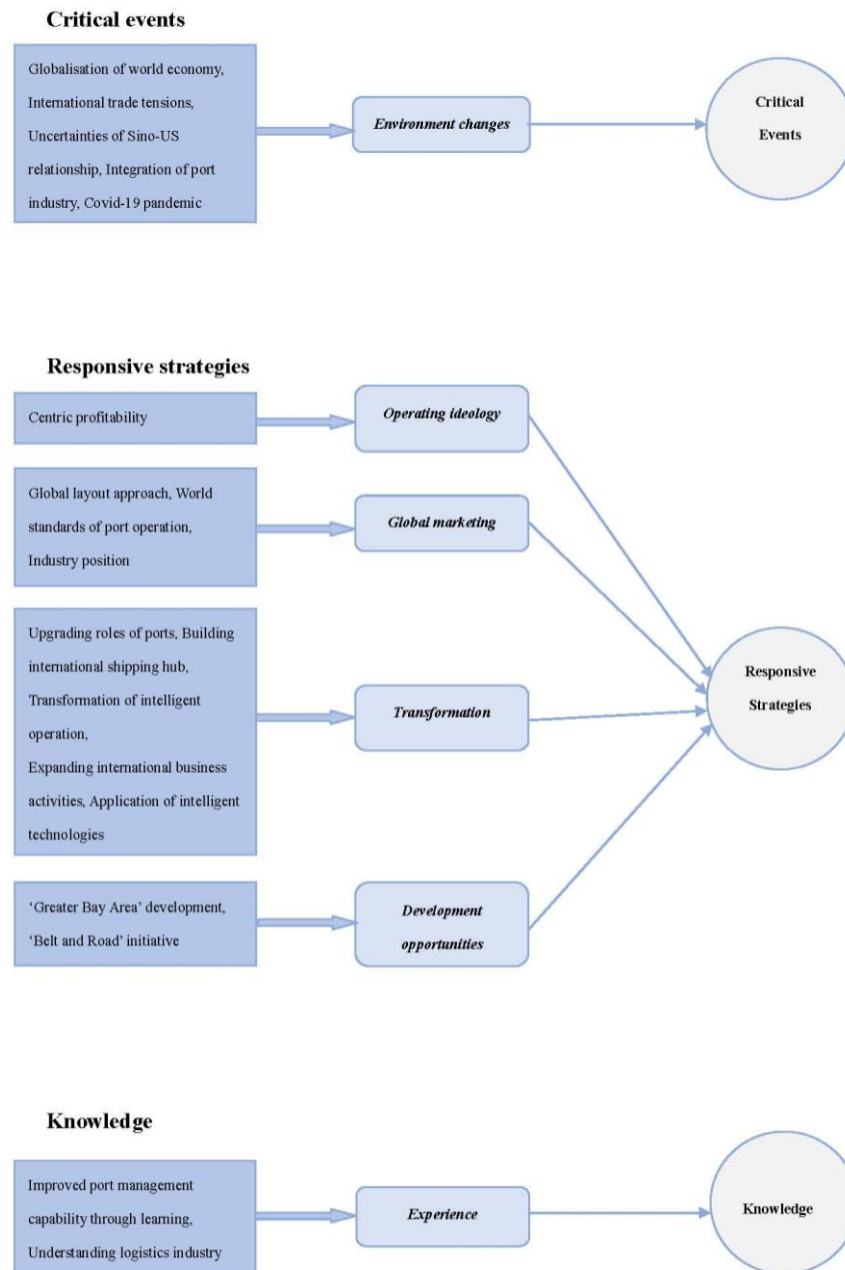


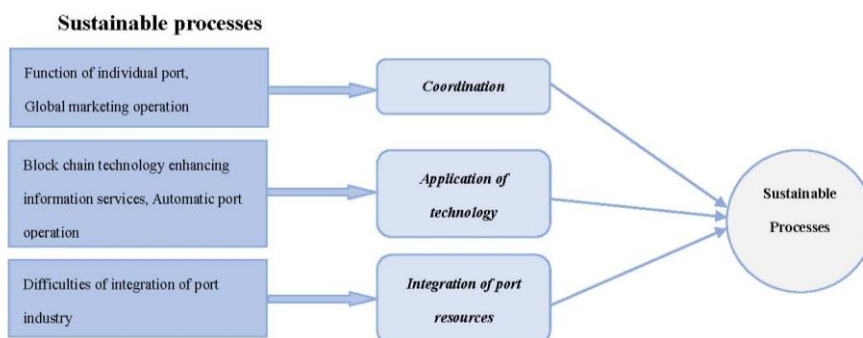
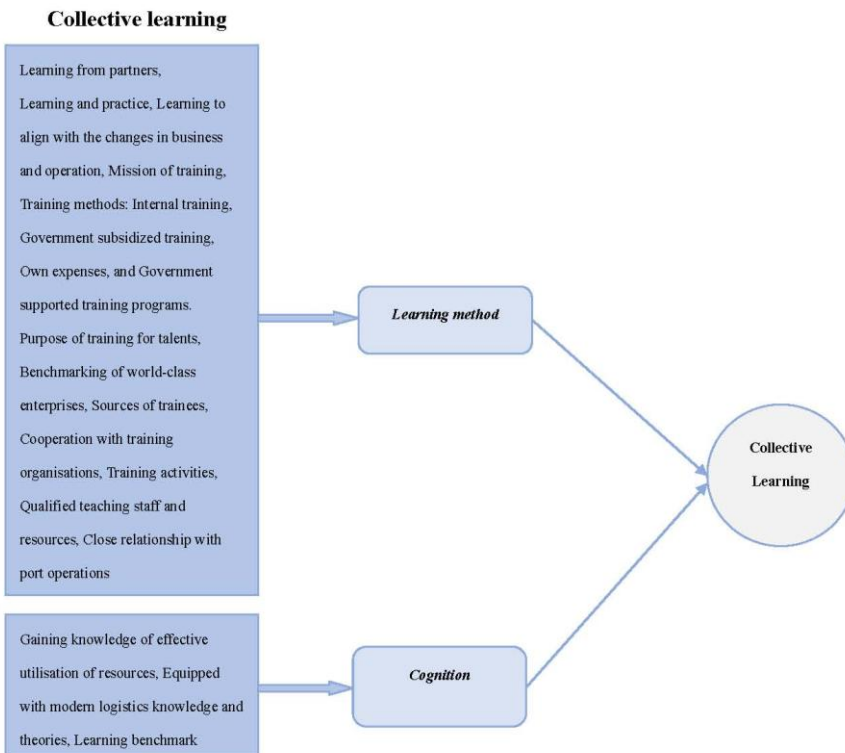
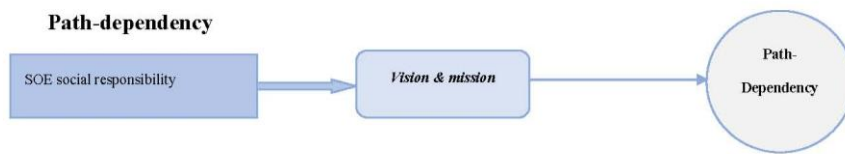
Application of technology	Automatic port operation	Block chain, technology, enhancing information services Automatic port operation		Application of technology
	Block chain, technology, enhancing information services			
Integration of port resources	Integration of port resources with difficulties			Integration of port resources
	Integration of port resources with difficulties			
Optimal resources amassment				Optimal resources amassment
Typology	General, Bulk, LNG, Container, Chemical ports			Typology
	General, Bulk, LNG, Container, Chemical ports			
Configuration	Integration port resources	Purpose of integration to avoid competition among peer operators, Purpose, Government influence	Application of intelligent technologies in port operation	Configuration
	Layout, Different stakeholders			
	Upgrading assets, Integration port resources, Layout, Different stakeholders, Purpose of integration to avoid competition, Government influence, Application of intelligent technologies			
Features of resources		Logistics functions Transportation hub and service centre		Feature of resources
	Role of port industry, Logistics functions, Transportation hub and service centre			
Core competencies				Core competencies
Embodiment	Close cooperation with global major port operators	Port function, Modern information system, On-line business, High end	Operating efficiency, Management efficiently and cost effectiveness	

Building path	port services, Knowledge, Ideology and experiences of talents, Role of physical assets	
	Operating efficiency, Management efficiently and cost effectiveness, Close cooperation with global major port operators, Port functions, Modern information system, On-line business, High-end port services, Knowledge, Ideology and experiences of talents, Role of physical assets	Embodiment
	Good JV partnership with global major port operators	
	Good JV partnership with global major port operators	Building path

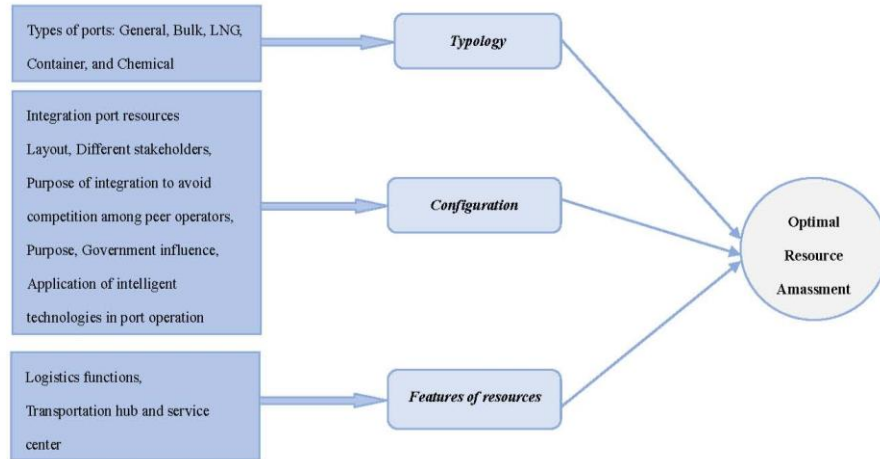
Figure 7 Synthesized Data Structure: Case 6, Case 7 and Case 8

1 st Order Concepts	2 nd Order Themes	Aggregate/Overarching Dimensions
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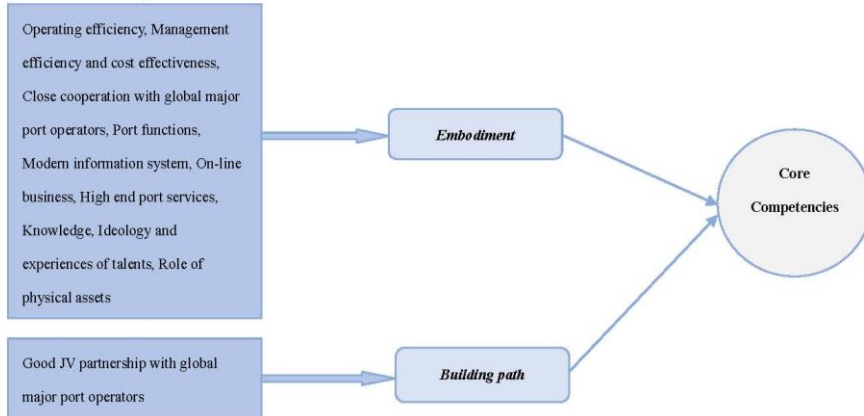




Optimal resources amassment



Core competencies



The results of five individual Cases analyses generated eight dimensions and 34 themes, and such results were presented in the data structures as shown in figures and representative supporting data as shown in data tables. The results of three individual Cases analyses of the industry association generated eight dimension and 17 themes, and such results were also presented in the same manner of the five Cases, except that one combined data structure is used for the results of the Cases of the three industry association as shown in Figure 6. These results of individual cases are the basis for cross-case analysis at the next phase of analysis process.

Chapter 5 Data analysis and results (cross-case analysis)

The research applied the cross-case analysis to identify common categories and missing items because of the limitations of perceptions of interviewees on different interview questions. First, the combined results of the cross-case analysis of all eight Cases are presented together with the results of individual Case analysis in Table 4 (shell table) below. Second, the combined result of the thematic analysis are displayed in data structure in Figure 8, and the representative supporting data of the combined results are included in Table 12 (data table) of Appendix 4. Third, the emerged dimensions are interpreted, and other findings were discussed.

5.1 Results of cross-case analysis

The cross-case analysis followed the approach that potential emergent frameworks are derived from the empirical data, and they were compared iteratively and systematically to develop a theoretical framework which is closely in alignment with the data (Eisenhardt, 1989, p.541). The results of the data analysis of individual case were compared and synthesized to develop the final theoretical interpretations. Two analytical methods were used to develop the combined results of the cross-case analysis, the comparison method of the multiple-case study approach and the thematic coding method (Gioia et al., 1994). In addition, a contrast method was also employed. The comparison method focused on similarities and differences of the results of individual cases, whereas the contrast method noted only the differences of the results. This constant comparison method by Clark et al. (2010) and Gioia et al. (1994) were used throughout the thematic development process. The instrument used in these three methods was the table shell. There are two sets of information for the analysis, the data and their categories in which concepts, themes, and dimensions are embedded. The shells were first completed in the table with coded data in categories denoted as

concepts, themes, and dimensions of the five Case Companies and the three industry associations. Then, these data were synthesized by extraction to generate dimensions. The combined results of the five holistic analyses and one result from analyses of three associations are presented in Table 4, Figure 8 with representative supporting data in Table 12 of Appendix 4. These figures and tables show the results of the data analyses, which formed the basis for further analysis for findings and conclusions. The results of the data analysis of the eight Cases were aggregated in the table shell that contains concepts, themes, and dimensions (Table 4), which shows the combined results on the far right column of Table 4, and the differences of contents of the results are in the shells of Table 4. Based on this matrix analysis, a data structure was developed (Figure 8) with representative supporting data shown in Table 12 of Appendix 4 according to the combined results. The contents of each column of Table 4 are corresponding to the result of each individual case analysis, and the column of the industry interviewees is corresponding to the combined results of the analysis of the three interviewees of industry associations. Following this presentation, descriptions on each emerged dimension, and comparisons of contents were presented. Individual and synthesized results and descriptions are presented below.

Table 4.Synthesised results of data analysis: All Cases

Case	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6,7 & 8 (Industry associations)	Synthesized results
Dimensions & Themes	Concepts	Concepts	Concepts	Concepts	Concepts	Concepts	Dimensions, Themes & Concepts
Critical event							Critical event
Environmental changes(c1)(c2)(c4)(c5)(c6,c7, c8)	Globalization of world economy,	US-China trade dispute,	US-China trade friction,	US-China relationship,	US-China trade friction, Global trade tensions,	Uncertainties of Sino-US relationship,	
External environment(c3)	Overseas political risks,	Global economic slowdown,	Public transportation change,	Uncertainty of global trade,	Uncertainty of global trade development,	Globalization, International trade tensions,	
	US-China trade friction,	Slow growth of port industry,	HK-ZH-Macau Bridge,	Changes in pattern of port industry,	Political situation, Port operation over capacity,	Integration of port industry,	
	Economic recession,	Production overcapacity,	Express railway, Restriction on importation of recycled waste,	Domestic port integration,	Increase of costs	Covid-19 pandemic	
	International competition,	Mega-vessels operation,	Covid-19 pandemic, ‘Greater Bay Area’ development,	Covid-19 pandemic, Slowdown of global shipping, Environment protection policy			
	Production over capacity,	Regional ports competition,	‘Belt and Road’ initiative	change,			
	Government policy, Opening-up	Policy of ‘Greater Bay Area’, ‘Belt and Road’ initiative		Change of cargo			

Responsive strategy	Development opportunities, Customer knowledge, Technical advancement, Industry integration, Digital transformation				structure, ‘Belt and Road’ initiative, ‘Greater Bay Area’ development	Exogenous critical events
	Globalization of world economy, Changes in global trade, Changes in domestic economic development mode, Changes in competition pattern, Integration of port industry, Development opportunities of ‘Belt and Road’ initiative and ‘Greater Bay Area’ development plan, Technical advancement, Digital transformation in operation of logistics industry, Logistic ecosystem business context, Impact of Covid-19 pandemic, Government environmental protection polices					
	Reorganization (c1)	Corporate restructuring,	Strategic merger of companies	Restructuring, Listing status	Restructuring, listing status	
	Restructure change (c3)(c4)	Business reorganization				
	Restructuring (c2)					
	Non-system risk (c3)					
	High operating costs					
	Corporate merger, Listing status, Business reorganization					

							strategy	
Global marketing (c2)(c6,c7,c8)		Learning global marketing,	Increase routes, Adjusting sailing schedules,	Pricing policy, Soft services, Identifying key customers	Different competition, Hot spot economic centre change over time	Global layout approach, World standards of port operation, Industry position		
Exploring market(c2)		Intensified operation in core business	Business repositioning,					
Business expansion(c3)			Attracting new customers/					
Marketing(c3)			Replication of business models,					
Competition(c3)(c5)			Entering new business,					
Marketing strategy (c4)			Overseas investments/ Asset type competition,					
Shifting economic centre(c5)			Information type competition					
	Identified customers, Values for customers, Equity controls, Global layout of operation, Conditions for development, Global oriented strategy, Operating benchmarks							Global marketing
Enhancing management (c1)	Change of management team,	Global perspective in management control	Authority for strategic planning,	Service quality, Operating efficiency and reasonable prices,	Quality services and operating efficiency, Customers' values,			
Customer satisfaction(c1)								
Management control(c2)	Understanding		Strategic formulation					

Destructors(c3)	customers' needs,	mechanism,	Project financing,	Investment,	
Decision empowerment (c3)	Market orientation	Decision principles,	Limitation on	Operation,	
Decision process(c4)		Strategic directives	investment decision	Appreciation of assets,	
Financial leverage (c4)		High turnover of	process	Long-term lease,	
ideology(c4)(c5)(c6,c7,c8)		executive,		Hot spot economic	
Sources of profit (c5)		Limitation of decision authorities, Excessive diversity of backgrounds of decision makers		centre changes ore time	
Management traits, Change of management team, Global perspective, Decision making process, Understand customers' value expectations, Service quality, Operating efficiency, Limitation on decision making authorities					Enhancing management
Intensifying operation(2)	Intensified operation	Challenges of		Differentiated	Global layout
Global marketing	in core business	environment,		competition,	approach,
(c2)(c6,c7,c8)	Market oriented	Shifting local logistics		Upstream and	World standards of port
Cause of action(c3)	development,	centre,		downstream operation,	operation,
Growth drivers(c3)	Studying	Risks and challenges		Hedging operating risks,	Industry position
Competition(c4)	macro-economy and	Building five		Integration of business,	
Integration(c5)	industry	operating platforms		Leveraging brand effect	
	development,				
	Development				
	philosophy,				
	'Belt and Road'				

opportunities						Intensifying operation
Integrating upstream and downstream operation, Integrated port related business, Differentiated competition, Application of digital technologies in operation						
Transformation & innovation(c1)(c2)	Role changed, Upgrading operation,	Construction of intelligent ports, Leveraging internet technology,	Transforming business models, Conducting domestic business,	Applying intelligent technologies, Innovative changes in business models,	Upgrading roles of ports, Building international shipping hub,	
Transformation(c3)(c4)(c6,c7,c8)	Digital transformation	Transformation, Integrating existing business	Full logistics service provider, Airfreight logistics, VRIN resource leverage, Business adjustment, E-commerce business, JV shuttle feeder business, Asset impairment, Leveraging existing resources, Union transportation mode, Cross industry transportation,	Competition pattern and partnership	Transformation of intelligent operation, Expanding international business activities, Application of intelligent technologies	

					Transformation & innovation
Tailor-made logistics plans, Multiple mode transport, Extending service chain					
Using information technologies, Intelligent operation projects, Digitalized transformation in operation and business models, Automatic and green port operation					
Capitalizing on opportunities Development strategy(c2)	Market oriented development,	Capitalizing on airfreight business	Capitalization on ‘Greater Bay Area’ development,		Capitalizing on opportunities
Market opportunities (c3)	Studying macro-economy and industry development,	Entering new markets	‘Belt & Road’ initiative		
Opportunities((c6,c7,c8)	Development philosophy, ‘Belt and Road’ opportunity				
Market oriented development strategy, Studying and exploring development opportunities					Capitalizing on opportunities
					Knowledge
Knowledge					Knowledge
Knowledge management(c2)	Professional and industrial	Building a talent team,	Experience and knowledge	Recognition and enhancement	
Experience accumulation(c1)					

Experience (c3)	experiences	Management	accumulation			
Accumulation (c5)		ideology, Accumulation and transmission of individual's knowledge				
		Success groped from practice, Transformation of inherent cognition into extrinsic cognition, Identifying target customers, Understanding needs of customers, Accumulation and transmission of knowledge, Internal training				Knowledge management
Experience(c1) (c4)(c6,c7,c8)	Professional and industrial experiences		Profession and expertise	Project investigation	Improved port management capability through learning, Understanding logistics industry	
Management traits(c3)						
		Professional and industrial experiences, Experience of the management team for investment decisions, Experiences in assets maintenance, Professional judgment for intelligent port operation				Experience
Cognition(c6,c7,c8)	Knowledge of	Judgment on			Gaining knowledge of	
Professional judgment (c2)	industry,	application of			effective utilisation of	
Customer satisfaction	State's policies,	intelligent operations			resources,	
Management traits	Development strategies, Customers' needs				Equipped with modern logistics knowledge and theories, Learning benchmark	
		Recognition of the needs of cooperation, Cognition of informationalization in operation, Talents with strategic thinking,				Cognition

Path-dependency	Knowledge updated in alignment with changes of business and assets, Enhancing cognition through practice and action						Path-dependency	
	Vision & mission(c1)(c2)(c3)(c4)(c5)(c6, c7,c8)	Global cargo terminal operator, Synergistic operation platform	The world-class comprehensive service provider, Expansion overseas projects and adhering to core business	Major transportation services provider, Integrated logistics business	World-class port, Port operation and construction	Integrated service provider of port investment and operation, Integrated services including bulk, Partial cargo and containerized cargo and multimode transportation services		SOE social responsibility
	World-class comprehensive port service provider, Adhering to core business of port operation , SOE social responsibility							
Development strategy(c1)(2c)(c3)(c4)(c5)	Consummating industry chain	Adhering to development strategy, Investment based on Judgment on market situation, Capitalisation on State’s development	Commitment to core business	Conducting related core business, Auxiliary business related to core business, Replication of development models	Adhering to core business		Vision & Mission	

Collective learning	strategies					Development strategy	
	Adhering to invest and operation ports, Development projects based on market condition, Market oriented development strategy, Capitalizing on State’s development strategy, Replication of development models						
	Government directives(1)	Digital	Government			Government directives	
	Investment criteria(c3)	transformation	requirements				
	Digitalized transformation, Government requirement about investment						
	Basics of decision(c3)	Management					Basics of decision
		experience &					
		knowledge					
		Management experience & knowledge, decision empowerment					
							Collective learning
Management capabilities(c1)	Professional	Commitment,					
On the job training(c3)	management	Belonging,					
		Experiences in industry					
E-Commerce thinking(c1)	Experience and professional management team, Background of professionals, Building a team of talents					Management capabilities	
	E-Commerce thinking & practice					E-commerce thinking & practice	
	E-Commerce thinking & practice						
Enhancing learning(c1)	Integration of	Learning from	Understanding the	Realization of the	From inherent cognition		

Industry position of firm(c1)	resources,	benchmarking port	industry,	needs of ports	to extrinsic cognition,	
Benchmark learning (c2)	Value of customers,	operators,	Understanding	investment,	Advocating cognition	
Adjusting services(c3)	Cognition of	Learning from JV	customers,	Prediction of		
Understanding investment	developing strategy,	partners	Cognition and	infrastructure		
needs (4)	Firm strengths		learning of features of	development		
Transformation of cognition			resources			
(c5)						
Collective adoption (c5)						
	Value of customers, Understanding the industry, Understanding customers, Cognition of the features of resources deployed, Realization of new investment of ports, Prediction of infrastructure development, Learning from benchmarking port operators, Learning from JV partners, Training with job related skills					Enhancing learning+
Training (1)	Recruiting talents,	Training,	Expatriating shipping		Success through	Learning from
Learning(c2)	Benchmark job	Self-improvement,	management		practice,	partners,
Learning from peers(c3)	training,	Job related skills			Replication of models	Learning and practice,
Practice (c5)	Training staff					Learning to align with
Learning method (c6,c7,c8)	with technical and					the changes in business
	profession skills					and operation,
						Mission of training,
						Training methods,
						Internal training,
						Government subsidized
						training,

						Own expenses, and Government supported training programs, Purpose of training for talents, Benchmarking of world-class enterprises, Sources of trainees, Cooperation with training organizations, Training activities, Qualified teaching staff and resources, Close relationship with port operations	Learning methods
Culture influences(1)	Learn from benchmark firms, Utilisation of resources, Research and innovation, Recruit global talents, Replication of operation models						
	Multiple cultures						
						Multiple cultural environment	Cultural influence
Sustainable process							Sustainable process
Integration(c1)(c2)(3)(c4)(c5)	Clients resource,	Acquiring new	Operating activities,	Full logistics chain,	Cross sector integration	Difficulties of	
Difficulties(c3)	JV ships	assets,	Logistics chain,	Port Network,		integration of port	

Motive of integration(c4)	Domestic and overseas resources, Technologies, Merger & corporate restructuring, Cross industry integration, Reallocation of resources	Container operation, Existing ports	Pool of VRIN port assets, Vertical integration, Service routes, Enhancing supply chain, Shipping schedules, Destructors of integration	Operating platforms Cultural factors, Bargaining power	industry	
Integration of port resources(c6,c7,c8)	Integration of core business, Building full industry chain and supply chain, Integration of internet technology					Integration
Coordination (c1)(c2)(c3)(c4)(c5)(c6,c7,c8)	Control of ships, Production process, Coordinating development modes, Communication with clients, Leverage synergy	Unification of Customs' zone, Overseas and domestic ports, Controlling development pace	Capability of coordination with partners/ Operating process including port development, Shipping building, Settlement services, Routines	Coordination with stakeholders	Port construction pace, Leveraging resources, Overseas opportunities	Function of individual port, Global marketing operation
Development pace(c2)	JV Partners, Leveraging resources, Function of individual port, Global marketing operation					Coordination
Optimizing(c3)						
Cooperation(c1) (3)(c4)(c5)	Operation with different resources	Alliance with major ports	Alliance or partnership with business partners,	Cooperation with related parties	Cooperation with major international port operators	
peer cooperation(c2)						
Peer partnership(c3)						

	Harmonious supply chain, Partnership with cross industry firms, Control of ships of peer operators		Leveraging operating Platforms, Customs facilitation,, Limitation, Equity JV, Air freighter, Manufacturers, Major liners, freight agencies, Union transporters		
	Cooperation with major international shipping lines, Equity investment in terminal projects				Cooperation
Transformation & innovation	Intelligent shipping,	High-Tech	Operating process	Upgrading marketing	Block chain technology
Innovation(c1)	Intelligent port,	utilisation,	including port	and information	enhancing information
Transformation (c2)	Intelligent business		development,	systems,	services,
Optimising(c3)	models,		shipping building,	Reducing costs,	Automatic port
Application of	Digital logistic		Settlement services,	Intelligent port,	operation
technology(c6,c7,c8)	ecosystem,		routines,	Building information	
Informationalization(c4)	Algorithms,			systems,	
Intelligent operation (c4)	Value of			New routes,	
	digitalization,			Overseas marketing	
	Path,			network,	
	Functions			Measures to enhance	
				service quality and	

Optimal resource amassment	efficiency, Leveraging function of hub port				Transformation & Innovation Optimal resource amassment
	Intelligent transformation by utilizing high technologies in operations, Innovation in business models and operation				
Purpose(1)(4)	Satisfying customers’ needs & values, Strategic growth		VRIN assets satisfying customers’ needs, VRIN assets as basic for core competencies, Objective of growth		Purpose
	Satisfying customers’ needs & value, Matching with increase of production activities, Upgrade ships to enhance production efficiency, Exploiting existing assets for operation synergy				
Criteria(1)(c3)(c4)	Satisfying	Port development	Core assets in core	Geographical location,	
Market orientation(2)	customers’ needs,	oriented by market	location,	Principles of	
	Production efficiency	development	Adapting to market development,	allocation,	
			Investment pressure	Evaluation, VRIN assets	
			Market orientation,		
			Limitations,		

Condition for investment							Criteria		
Dominant geographical locations, Satisfying customers' needs, Satisfying operation requirement, Replacement of obsolescent assets, Relating core business, Satisfying performance needs, Satisfying requirement of SASAC in terms of ROI and ROE, Upgrading assets, Assets with VRIN attributes									
Typology(1)(c3)(c4)	Tangible assets and	Building port	Layout of VRIN	VRIN tangible assets,	Types of ports:				
Building platform (c2)	intangible assets,	ecosystem,	assets,	Operating assets	General, Bulk, LNG,				
Features of resources (c6,c7,c8)	Strategic layout of ports	Smart port	Possessing heavy	Container, and					
			assets,	Chemical,					
			Balance portfolio of	Logistics functions,					
			assets,	Transportation hub and					
			Contribution of VRIN	service centre,					
			assets,	Logistics functions,					
			Correlation among	Transportation hub and					
			resources,	service centre					
			Evaluation,						
			Tangible assets,						
			Operating and						
			management						
			information systems						
			Tangible assets with VRIN attributes, Shipping centers with cross-industry operation, Integrated transportation hub, Cargo ports with VRIN geographical locations, Ships, Terminals, logistics warehouse, Cargo handling plant and machineries, Digital logistics ecosystem, Balance of portfolio of assets						Typology
			Configuration(1)(c2)(c3)(c4)(c6,c7,c8)	Global deployment	Construction modern	Adjustment methods,	Full coverage of	Interplay effects of	Integration port
	of resources,	ports,	Outsourcing service,	marketing network,	assets,	resources,			

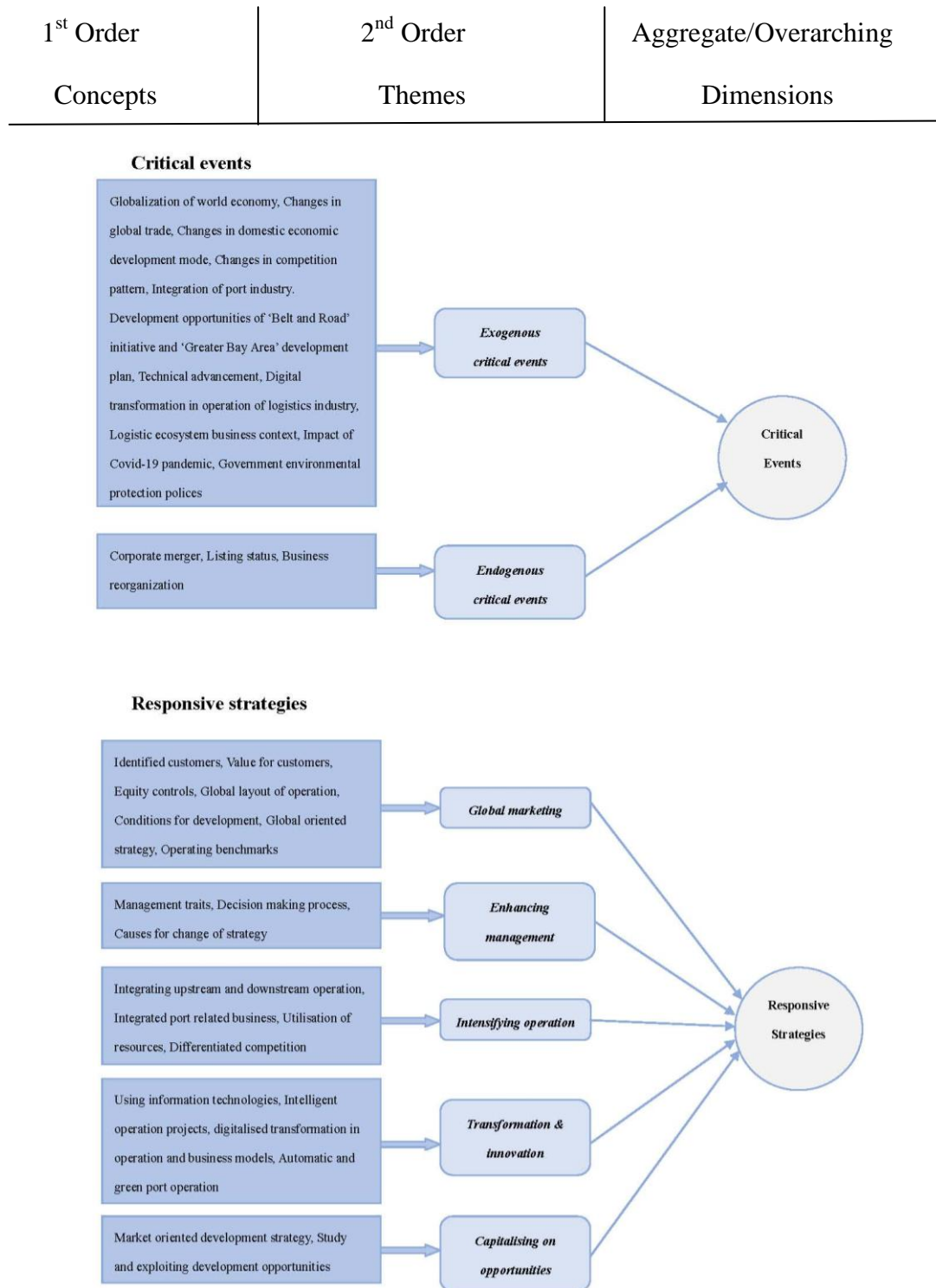
Building platform	Global shipping	Green port,	Disposal of assets,	Outsourcing,	Consummating port	Layout,	
Upgrading assets(c4)	network,	Hub port	Criteria of disposal,	Free hold or lease hold	function in new project,	Different stakeholders,	
Synergy(c5)	Global operating	construction,	Criteria of selecting	assets,	Building new terminals,	Purpose of integration	
	network,	Home base port,	assets,	Government allocation	Building integrated	to avoid competition	
	Layout of ports and	Upgrading ports,	Premises of portfolio	of assets,	logistic chain,	among peer operations,	
	routes,	Layout of ports	of resources,	Upgrading,	Merger and acquisition	Purpose,	
	Overseas port		Method of acquisition,	Disposal,	of regional ports	Government influence,	
	investment,		Purpose of	Government franchise,		Application of	
	Integrating		configuration,	Focusing on key		intelligent technologies	
	overseas		Internal asset building,	terminal projects,		in port operation	
	resources,		Asset allocation by	Developing hub port,			
	Integrated industry		Governments,	Expanding terminal			
	clusters,		Upgrading assets,	space,			
	Consummating		Smart port,	Building automatic			
	industry chain,		Renewing ships,	terminal			
	Intelligent ports,		Building operation				
	Advanced ships		platforms,				
			Improving warehouse,				
			Maintenance of				
			equipment,				
			Function improvement				
			Port infrastructure,				
			Overseas expansion,				

							competencies
Embodiment(c1)(c2)(c3)(c4)	Innovated business models ,	Experience management team,	Sustainable operating capability,	Identifying recipients, Different business format of customers,	VRIN asset, Franchise,	Operating efficiency, Management efficiency	
(c5)(c6,c7,c8)	Production efficiency ,	Possessing rare nature deep water port,	Possessing and leveraging VRIN assets,	Values delivered to customers,	Efficient terminal operation and management	and cost effectiveness, Close cooperation with global major port operators,	
Basis of building (c4)	Full industry chain, Talents,	Leveraging VRIN assets,	Possessing VRIN assets,	Quality services and efficient operation,		Port functions,	
	Ability to acquire overseas assets,	Government policy support,	Capability to identify core assets,	Cost effectiveness, VRIN assets,		Modern information system,	
	Expansion by acquisition ,	Access to cargo base,	Excavate potentials of resources,	Franchise Location,		On-line business, High end port services,	
	Integration of resources	Creating global port portfolio	Marketing brand	Cargo base, hub function, Operation platform, Management capability, VRIN resources guarantee bargaining power and market positions		Knowledge, Ideology and experiences of talents, Role of physical asset	
Capable management team, Government franchise operation, Rare deep water port, Mega-ship operation capability, Access to cargo bases, Efficient operation and management, Brand name, Efficient logistics facilities, Assets with VRIN attributes, Marketing network, Efficient communication with							Embodiments

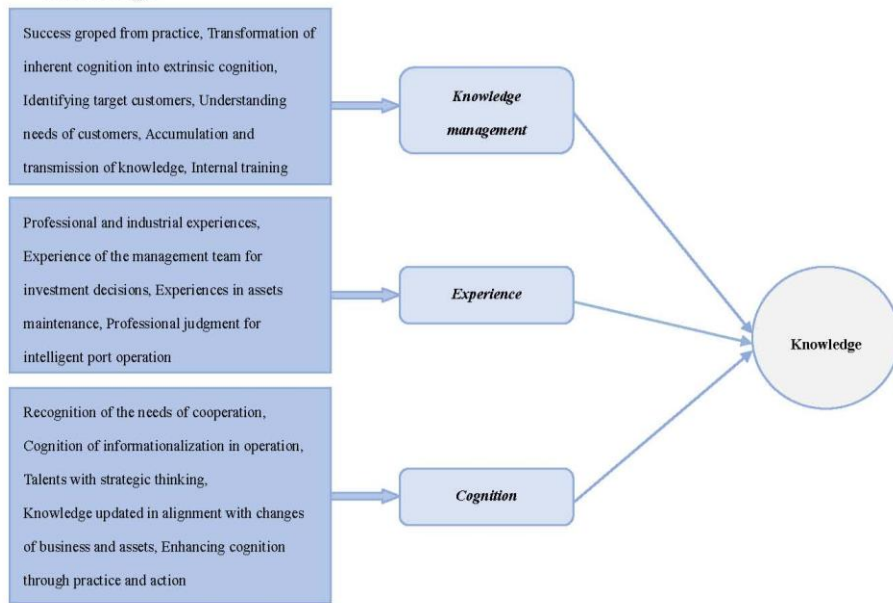
Typology	VRIN assets, Supply chain, Industry chain, Asset-based, Management-bases, Operation-bases, Intelligent-based		Typology
	VRIN assets, Supply chain, Industry chain, Asset-based, Management-bases, Operation-bases, Intelligent-based		
Relationship (c3)	Heavy assets cultivating and enhancing core competencies, Positive cycle		Relation
	Heavy assets cultivating core competencies, Reciprocal		
Development phase(c3)(5)	Different development phases, Different type of core competencies	Different core competencies at different development phase	Development phase
	Different core competencies accommodating different development phase		

This table shell combines concepts, themes, and dimensions. Data were synthesized by extraction to generate eight dimensions as shown in Figure 8 below, and the synthesized supporting data are shown in Table12 of Appendix 4.

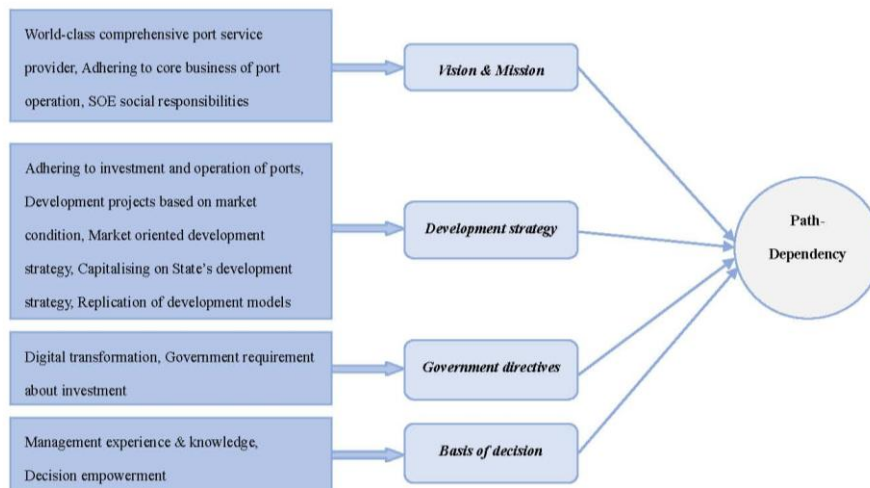
Figure 8 Synthesized Data Structure: All cases

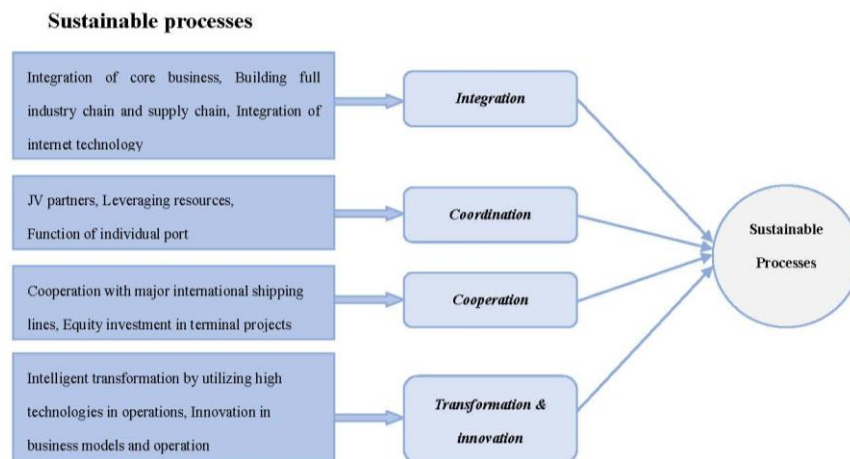
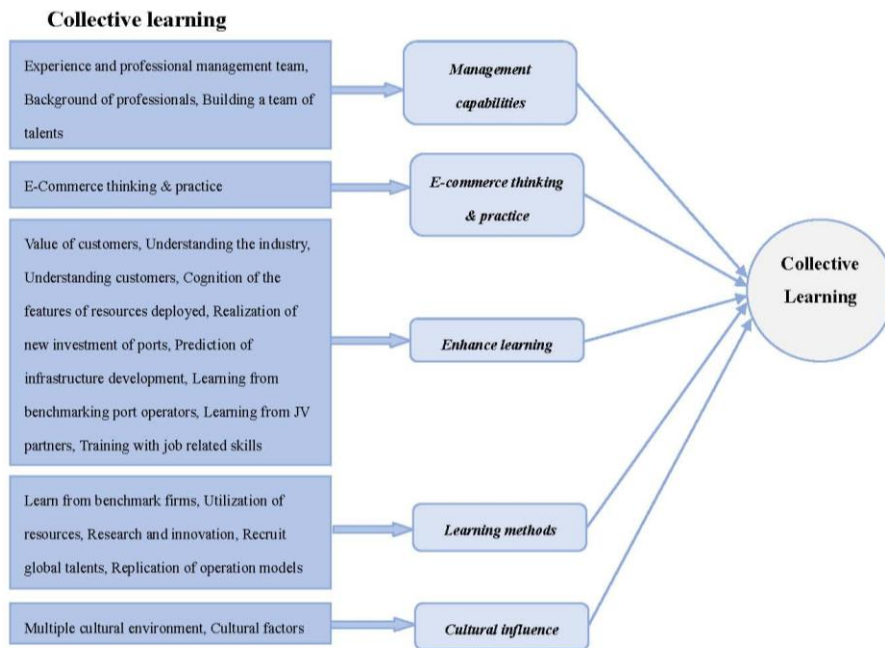


Knowledge

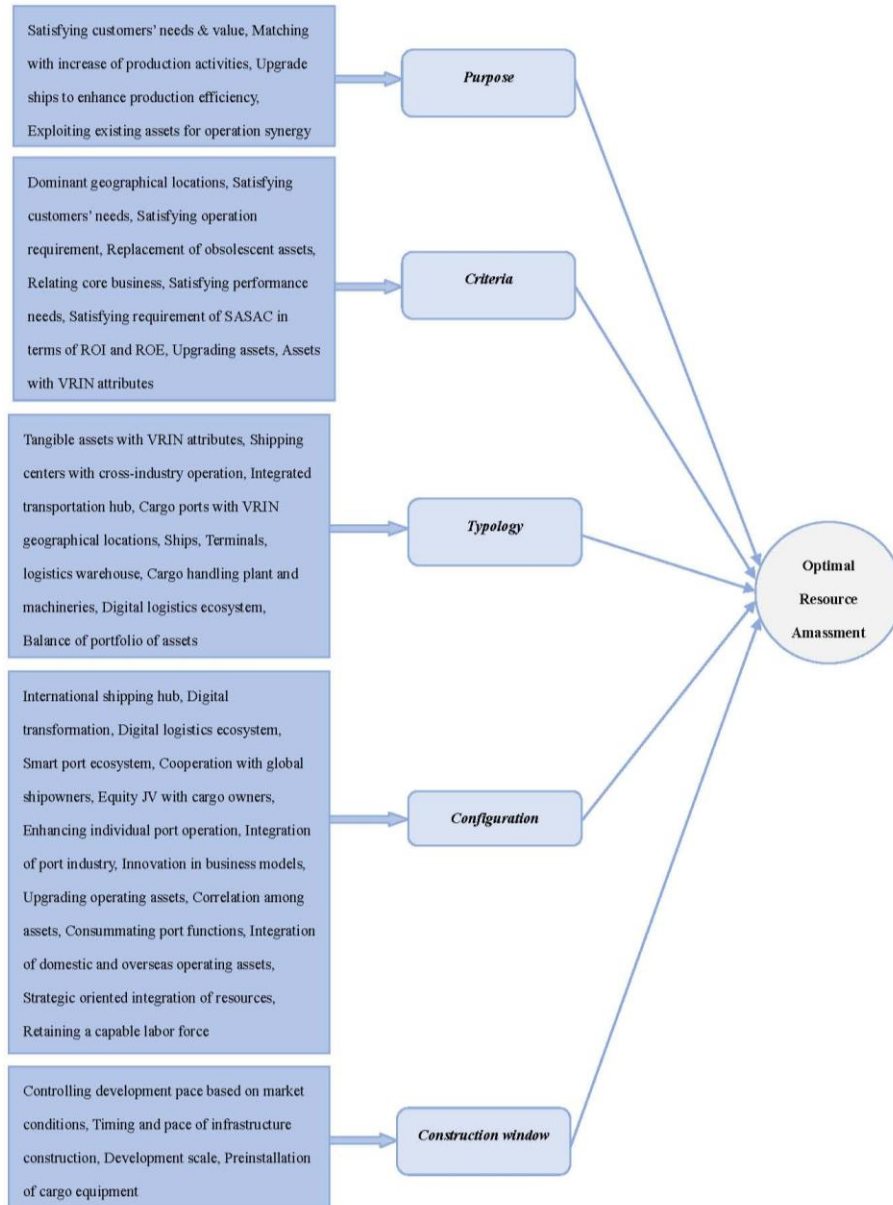


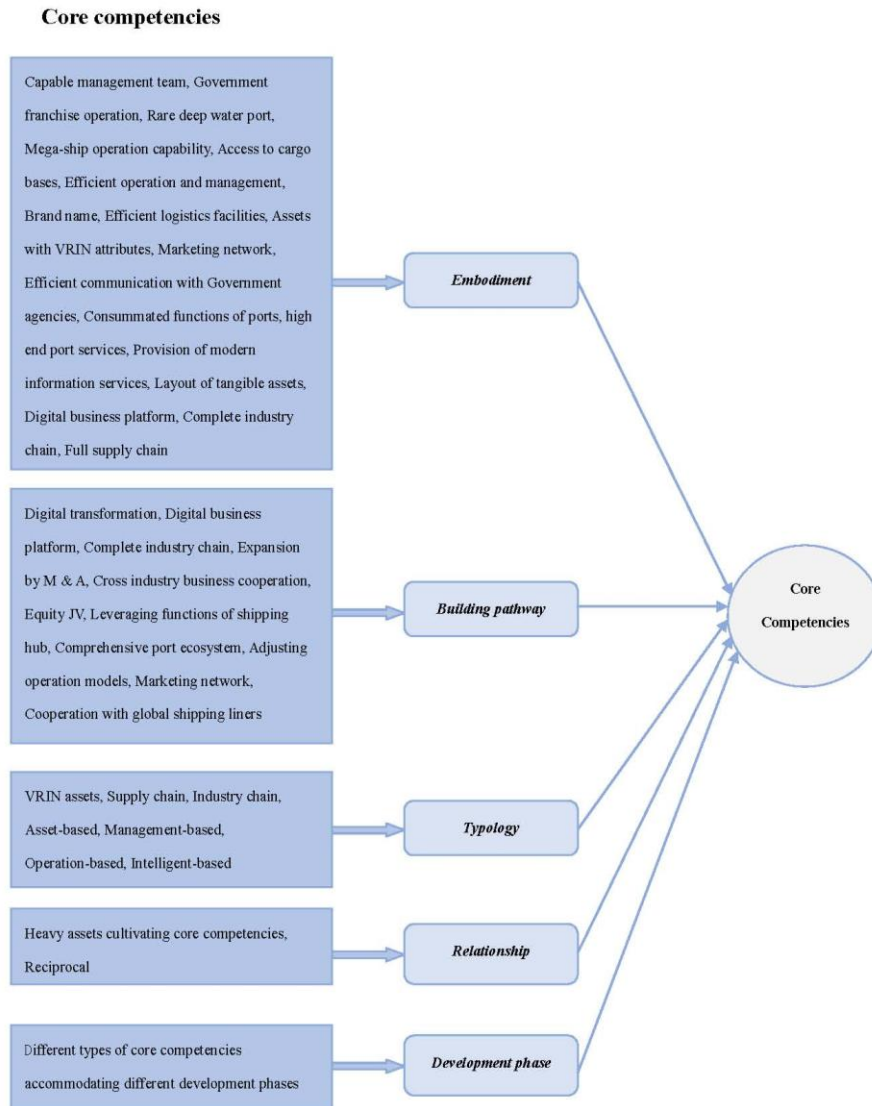
Path-dependency





Optimal resources amassment





The process of developing synthesised results

The process of developing synthesised results (concepts, themes, and dimensions) consists of two parts: the individual case analysis and the cross-case synthesis. The synthesized results were based on the analysis results of five individual Case Companies and the three industry associations. The researcher used three instruments to organise and analyse data, and present the results respectively, i.e., *table shell*, *data structure*, and the *data table* in both parts of the analyses. Specifically, the table shell (Table 4) organized and presents the analysis results of individual cases and the synthesised results. The data structure (Figure 8) presents the synthesised results in

diagrams, and the narrative analysis follows. Then, the data table (Table 12 of Appendix 4) provides representative supporting evidence to data structure (Figure 8). The process of developing the synthesised results is illustrated with three emerged dimensions as examples: *collective learning*, *optimal resource amassment*, and *core competencies*, based on Table 4, Figure 8, and Table 12 of Appendix 4.

First, the process of emerged dimensions is illustrated with the example of *collective learning*. On the far left column of Table 4, the dimension of collective learning has 16 themes: management capabilities, on the job training, E-commerce thinking, enhancing learning, industry position of firm, benchmarks learning, adjusting services, understanding investment needs, transformation of cognition, collective adoption, training, learning, learning from peers, practice, learning method, and culture influences. These 16 themes were derived from the primary concepts in shells of Table 4, and the primary concepts were developed from the open coding process by text analysis and content analysis on data gathered. For example, the theme of synthesized management capability was developed from the primary concepts of Case 1 (Professional management; see p.170)¹⁰ and Case 3 (Commitment, Belonging, Experiences in industry; see p.170 and p.171) by the axial coding process, and it was intensive. On the far right column are the synthesised results of the cross-cases analysis, accordingly, the number of themes of collective learning was reduced from 16 to five (see pp.170-72). Accordingly, the synthesised themes of collective learning are management capabilities, E-commerce thinking and practice, enhance learning, learning methods, and cultural influence. Finally, these five themes constitute the dimension of collective learning by selective coding (see pp.170-72).

¹⁰ See pages of this Thesis.

Second, the relationships among concepts, themes, and dimensions are illustrated with the example of the dimension of *optimal resource amassment* (see p.175). The emerging process of this dimension is the same with that of collective learning. After this dimension was identified, it was presented in Figure 8 (see p.185) with its themes and primary concepts under the headings of 1st order concepts on the left side, 2nd order themes in the middle, and Aggregate/overcharging dimensions on the right side (Clark et al., 2010, p.409; Gioia et al., 1994, p.369). These concepts, themes, and the dimension are connected with arrows to show their relationships (see p.185).

Third, the provision of evidence for the emerged dimensions is illustrated with the example of the dimension of *core competencies* by using data table (Table 12). The data table assembles representative supporting data under headings of 2nd order themes, and Representative 1st order data gathered from eight Cases, and it provides solid evidence for data analysis (Clark et al., 2010, p.410). In this example, the dimension has five synthesised themes (see p.186): embodiments, building path, typology, relation, and development phase. Accordingly, Table 12 provides the representative supporting data gathered from eight Cases for those themes of the dimension.

5.2 Understanding emerged dimensions

The cross-case analysis generated eight dimensions as presented in Table 4 and Figure 8 above, and each dimension has themes and concepts as shown in Table 4, Figure 8, and Table 12 of Appendix 4. These dimensions constitute the basis of the conceptual framework of the mechanism used by Case Companies to build their core competencies. These results substantiated the validity and reliability of the investigation instruments of protocol and the questionnaire, and such results

confirmed the effectiveness of the research methods of individual case analysis and the cross-case analyses. Two dimensions, i.e., *critical events* and *responsive strategies*, are distinctly suggested by the empirical data of the Cases, and their causal relationship is explicitly established on such data. The dimensions of *knowledge* and *path-dependency* were supported by the literature and data, and *collective learning*, *sustainable processes*, *optimal resources amassment*, and *core competencies* were originated from the definitions of core competencies by Prahalad and Hamel (1990) (Figure 1). Accordingly, each dimension is described and interpreted.

Critical events

Critical events mean any events that sufficiently cause needs to make new strategic decisions in response to changes in business environment, and critical events can be exogenous or endogenous. Such events include social, political, economic, competitive, and technological changes (Liu, 2013, p.2824). In addition, critical events include changes in internal affairs, e.g., changes in corporate structure, business models or management systems. Data revealed that external critical events are mainly system risks and opportunities, which are from social, political, economic, and technological changes. Examples of external critical events include US-China trade friction, changes of Government environmental protection policies, opportunities of ‘Belt and Road’ initiative and ‘Greater Bay Area’ development plans, and industrial risks and competition. Internal critical events refer to those instances within organizations including corporate restructuring, and changes in strategies, human resources, technologies, operation transformation, resources, and financial distress.

Responsive strategies

Responsive strategies refers to the decision making process for strategies in response to critical events. It is about the judgment, verification or evaluation of strategies. Wilkens et al (2004) defined strategy as the pattern of interaction, which generates core competencies (p.8). Data analysis revealed that strategies were usually developed to cope with critical events. Corporate strategic decisions mainly focused on mobilization and reorganization of tangible assets and intangible resources. Examples of strategic decisions include decisions on investments of new berths, building new ships, extension of warehouse space, integrating of port resources, digital operational transformation, and building of logistics ecosystems. Turvani (2002) pointed out that a firm's growth and innovation go synchronously in the use of firm's productive resources, and innovation means new commitments and the needs for new strategic decisions (p.197). Therefore, strategic decision-making is closely related with critical events.

Knowledge

Knowledge is the basis and premise for decision making in terms of selecting alternatives of strategies or choices of processes to deploy resources. Knowledge assures correct selections of strategies and methods; this critical element is about the capacity to interact, understand, and interpret in patterns in complex environment (Wilkens et al., 2004, p.13). Knowledge plays an important role in the growth of a firm. Knowledge means 'know-how' and 'ways of knowing how' that guide individuals to understand their capability to resolve problems (Turvani, 2002, p.211). The knowledge that a firm can draw on is embedded in intangible resources specifically managerial and human resources, and the rate of growth of an organization depends on its knowledge (Turvani, 2002, p.197). This critical element

of knowledge is about the capacity to interact, understand, and interpret in patterns in complex environment (Wilkens et al., 2004, p.13). While knowledge resides in human resources, technological knowledge is embedded in machinery; and such machinery and human resources are physical vectors of such knowledge (Turvani, 2002, p.203). Knowledge in an organization evolves over time, and the normal practice to improve the quality of individual knowledge includes training, learning by doing, continuing education, and acquisition of new skills (Turvani, 2002, p.203). In addition, competencies are defined as the work-related knowledge; skills and abilities or applied knowledge, and individual competence may be gained through education and experience in the workplaces (Nordhaug and Gronhaug, 1994, p.91). Accordingly, the dimension of *collective learning* will be influenced by two proximate dimensions: the *knowledge* and the *sustainable processes*. The change in collective learning is mainly made possible through the changes in knowledge, which can be characterized as explicit knowledge and tacit knowledge. Knowledge is a resource for SCA (Nix and Zacharia, 2014, 261), and understanding the shared mental model of individuals is a method to understand the process of generating core competencies (Wilkens et al., 2004, p.8).

Path-dependency

Path-dependency means that firms are established for specific purposes, which are defined by the corporate vision and the mission statements that capture the major goals and corporate philosophy. A vision statement describes a firm's fundamental reasons for existence, while a mission statement defines firm's business, objectives, and approach to achieve such objectives. These statements serve to resonate with employees, and inspire commitments, innovation and execution. Path-dependency implies that the development of a firm consistently follows its past track of

development; especially, it is obvious in the case of huge capital expenditure in logistics industry. Paths guide the firm to make alternative strategic decisions in terms of returns and attendant path-dependencies (Teece et al., 1997, p.518). Inconsistent strategy change may cause deviation from the course of the development of a firm, resulting in uncertainties. Path-dependency is a development strategy of the firm, which means company adheres to its core business as stipulated in company's vision and the mission statements.

Collective learning

Collective learning generally agrees with the term of organisational learning. This understanding suggests that collective learning is the most important element in building core competencies because it needs individual motives for advancement and organisational drivers for growth. 'Learning is cumulative and learning performance is greatest when the object of learning is related to what is already known' (Cohen and Levinthal, 1990, p.131). This means that the iterative interplay among collective learning, processes, and the resources create improved performances of a firm. This dimension relates to two main themes: knowledge and cognition. While corporate core competencies were embedded in the structure of knowledge of a firm (Edgar and Lockwood, 2011, p.61); cognition refers to the entrepreneurial judgment to perceive potential new resource combinations and replacement (Ghoshal et al., 2002, p.279). Cognition and learning are capabilities; they are also regarded as psychological process in response to external stimuli. Awareness and understanding of external stimuli need a process to be transformed into cognition and action. Data suggested that cognition goes synergistically with learning. As Deist and Winterton (2005) argued that there are mainly three types of competencies, the functional, cognitive, and the behavioral competency. The first two are generally incorporated in behavioral

competency that includes knowledge, skills, and competencies (Deist and Winterton, 2005, p.29).

The concept of collective learning was not clearly defined by Prahalad and Hamel (1990). In Figure 1, collective learning can be regarded as one of the capabilities of the firm. In addition, coordination and integration can be regarded as the mechanisms of utilisation of resources, and the production skills and technologies can be regarded the resources possessed or controlled by the firm. Generally, the concept of collective learning was defined by Capello (1999) as ‘a social processes of cumulative knowledge, based on a set of shared rules and procedures which allow individuals to coordinate their actions in search for problem solutions’ (Capello, 1999, p.354). Wang and Chugh (2014) discovered three pairs of key learning typology under the concept of entrepreneurial learning, which are individual and collective learning, exploratory and exploitative learning, and intuitive and sensing learning. Wang and Chugh (2014) defined individual learning as ‘the process in which individuals acquire data, information, skill or knowledge’ (p.34).

Capability means the inherent ability; it can be improved and enhanced from continuing learning process. Capabilities are special types of resources that enhance the productivity of other resources, and a firm responds to the environment through the process of change, learning, and adaptation (Fiol and Lyles, 1985, p.805). Organizations have to learn, and adapt to changes; and this would strengthen an organization’s ability to survive (Fiol and Lyles, 1985, p.808). Since core competencies are based on knowledge and skills; such core competencies can be enhanced through learning by doing, which is accumulated through experiences and improved through practice (Reed and DeFillippi, 1990, p.91). Apparently, cognition

and learning are the critical elements in the process of building core competencies; and they are the essences of the concept of core competence.

Sustainable processes

Sustainable processes are the normally and consistently applied processes to utilise a firm's resources in alignment with the strategies deployed. The essence of strategy formulation is to harmonize the utilisation of core resources and capabilities that a firm possesses or controls (Grant, 1991, p.129). A firm's SCA resides in distinctive processes of a firm such as coordination and integration of strategic resources, and such processes depend on the evolution paths the firm adopted for the accumulation of resources (Teece et al, 1997, p.509).

Optimal resources amassment

Optimal resources amassment is about the building of a resource base of a firm, and it means the accumulation, adjustment, upgrading, and maintaining tangible assets and intangible resources. Smith (2008) argued for the need to align competencies, capabilities, and resources. He pointed out that without sufficient resources, competencies and capabilities would be groundless, and it would be impossible to enter the market (p.52). In addition, a firm's competitive advantage depends on their resources and capabilities accumulated over time (Grant, 1991, p. 127). In practice, firm-specific assets are required for successful implementation of strategy to cope with the challenges (Dierickx and Cool, 1989, p.1505). Corporate strategies may affect firm resources because certain strategies require specific mixture of physical assets, human resources, and organisational capital resources for implementation (Barney, 1991, p. 106). Literature emphasized the importance of resources in formulating and implementation of strategies, and it stressed the links among

resources, competencies, and SCA. In practice, strategies require support of different kinds of resources of a firm.

Core competencies

Although *core competencies* are invisible, literature suggests that they are embedded in certain visible forms, e.g., products or services, and individual employee. As Prahalad and Hamel (1990) pointed out that core competencies can be embodied in individual employee, critical products or services (p.83 & p.90). First, according to the decomposition framework (Figure 1), invisibility refers to the property of the concept of core competencies, which is the collective learning. This property has two dimensions: the coordination of production skills and the integration of technologies. Second, visible forms mean that ‘products are the manifestation of competences, as competences can be molded into a variety of products’ (Teece et al. 1997, p.529). Third, organisational capability refers to the ability of a firm to carry out effectively the utilisation of resources (Ghoshal et al., 2002, p.279); and organisational competencies are dependent on the organisational capabilities which are derived from individual capabilities (Trejo, Asce, Patil, Anderson, and Cervantes, 2002, p.45). Collective learning is a special capability of an organization, and core competence is the effective integration of technologies, knowledge, skills, and experiences (Yang, 2015, p.174). Further, core competencies are the foundation of a firms’ SCA; and in the long term, SCA is based on a firm’s capability to build core competencies (Yang, 2015, p.174). Core competencies are enhanced by accumulation and integration of knowledge, skills, experiences, and time; competitive advantages are actually reinforced by adapting to the competitive environment (Lin, Lee, and Tai, 2012, p.155). The literature suggests that the source of SCA is a firm’s core competencies, which are based on the capability of the firm to integrate effectively their resources;

and such capability is determined by their collective learning. Therefore, the materialization of core competencies suggests that changes in tangible assets would change the services of such assets; and such materialization would cause changes in the process, knowledge, and collective learning in using assets.

5.3 Comparison analyses of Cases

Comparison analyses were performed on similarities and differences of the data. The analyses stressed nine issues: capital structure, business, supervision authority, location of business, geographical location of key operating assets, mission, vision, operating strategies, and the type and size of assets. The five Case Companies are successful Chinese port enterprises, belonging to three levels of the Chinese Governments. Two of them belong to the Central Governments; one belongs to a provincial Government; and the other two belong to two municipal Governments. Because of their ownerships, they have similarities in operation and assets but they have differences in business domains, investment, and operating locations. Each company is unique in business in terms of geographical location, target clients, strategies, and core competencies. These five case companies possess three distinct core competencies: (1) innovation in models of business and operation, e.g., building logistics ecosystem, (2) effective utilisation of technologies, e.g., using 5G, big data, and algorithms for intelligent port operations, (3) the acquisition of strategic resources both at home and abroad (Figure 8 and Table 12 of Appendix 4).

5.3. 1 Business analyses of Case Companies

When comparing these Case Companies, resemblances were identified. First, these companies are SOEs and their shares are listed on stock exchanges with majority of shares owned by Governments, and a minority of shares owned by private investors.

They have clear and documented corporate visions and missions. Second, these companies engage in the logistics business, and they are the leaders in the industry with global business presence. They provide container loading and unloading, storage, delivery, and transportation services. They also provide warehousing, packaging, and consolidation services. Third, they own or control, operate, and manage extensive tangible assets including terminals, berths, container yards, warehouses, handling equipment, and transportation vehicles. These operating assets satisfied the criteria of VRIN. Fourth, they are responsive to take concrete actions to cope with challenges arising from the environment through adjusting their resources.

Certain differences were also identified in the areas of operation location, assets, and strategies. Case 1 operates extensively in a global arena with heavy investment in construction of container ports in Europe, Africa, Asia (along the ‘Maritime Silk Route’ launched by the Chinese Government), America, and South America. The mission of the company is to offer a synergistic platform of port operation for global shipping industry; it is called ‘the ports for all’. The development strategy of the company is to insist on green development of port construction projects, establish win-win cooperation with clients, care for employees, and commit to social responsibilities. Case 2 was reorganized from two port operators within the same group of an SOE of the Chinese central Government, and it is one of the key players in the global logistics industry. The company operates and invests in container terminals nation-wide and abroad. The vision of the company is to become a world-class integrated port service provider, and the mission is to provide synergistic logistics services both at home and abroad. The development strategy is to uphold its long-term strategy, and to tap corporate competitive edges through technology innovation. Case 3 is owned by a key provincial SOE of the Guangdong Government.

It mainly operates and invests in river cargo ports in Guangdong as well as operating logistic services in South East Asia. The company operates the largest fleet of passenger ferries in the world. The vision of the company is to become a key waterway public transportation services provider; and the mission is to utilise efficiently its strategic assets for better services to its customers. The development strategy is 'Based in Hong Kong, Backed up by the Mainland, and Facing the World'. Case 4 is owned by an SOE belonging to the Guangzhou Municipal Government. The company operates the international navigation hub port together with a cluster of domestic ports in southern China. The vision of the company is to become a 'World-Class Port, Serving the World', and its mission is to upgrade port operations and explore new business dimensions for growth. The development strategy is to consolidate port resources by building intermodal transportation and improving port infrastructure. Case 5 is owned by an SOE belonging to Shenzhen Municipal Government in China. The company operates a deep-water port in Shenzhen, serving the vast developed economic area in southern China. The vision of the company is to become an 'integrated service provider of port investment and operation with brand influence'. Its mission is to provide an integrated multimode transportation service for clients with the development strategy of 'One City, One Port, One Operator'. By contrast, these five companies belong to the central Government, provincial Government, and municipal Governments, respectively. They operate in the global context, but in different dimensions. They have similar resources, but in different types, serving different customers; and they have different visions and missions pursuing different policy objectives

These Case Companies are the leaders in the industry, and four of them were ranked in top 10 in year 2018 in the world in terms of number of container traffic. Their

successes were secured by their competitive advantage in the market, which were built on core competencies. In 2018, these companies recorded satisfactory results despite the US-China trade friction, which severely affected the Chinese economy and the world economy. These companies maintained sound financial positions, with debt to total assets ratios ranging from 22 percent to 40 percent which are considered low and safe against other peer operators worldwide. They maintained a balanced structure of tangible assets and intangible assets in the range of 51 percent to 64 percent. However, there is one exception that Case 5 has a ratio of 81 percent of tangible assets over its total assets because of its ambitious terminal expansion projects. The profit margins showed that these Case Companies operated successfully with ratios from 9.3 percent to 39.6 percent. Case 5 had a profit margin of 126.7 percent because of its diversified toll road operation which generated steady cash inflows. In the difficult year of 2018, these Case Companies still recorded positive ROEs ranging from 3.4 percent to 8.1 percent.¹¹ The performance results showed the healthiness of their operations and proved that their strategies were effective. These performance indicators justified the effectiveness of their strategies; therefore, the existence of their core competencies.

5.3.2 Operational analysis of Case Companies

Cross-case comparisons were performed with the instrument of Table 4 (Table Shell), whereby individual cases were juxtaposed and compared to look for similarities and differences in order to gain more sophisticated understanding of the data (Eisenhardt, 1989, p.540 and p.541). The results of data analyses revealed resemblances and variations of individual case results (Table 4). First, the main similarities are that firms' management exercised their capabilities to use their resources through various

¹¹ Source: Performance indicators are from annual reports of Case Companies.

mechanisms, e.g., coordination or integration. Second, the firms engaged extensively in the utilisation of tangible assets in addition to the application of intangible resources. Third, the firms enhanced their core competencies through R & D and innovation in terms of system restructuring and improvements in tangible assets such as the digital transformation in operation and the upgrading of operating assets. As a result, eight dimensions were addressed by the five Cases, but the emphases of themes by each Case were not identical. For example, emphases were made on building tangible assets, but fewer emphases were made on the building of human resources for core competencies. This can be explained by the fact that these Case Companies attached more importance to building tangible resources base because they are port operators heavily invested with capital in tangible assets.

Their successes can be attributed to three factors: (1) the responsive strategic changes to cope with challenges arising from the environment, (2) the strong support from parent companies in terms of funds and policies, 3) their established core competencies. The data analysis revealed that these Case Companies had clear visions and missions. They remained proactively responsive to changes in the business environment by coping with challenges and capitalizing on opportunities. To overcome the impacts from the market downturn in transportation in 2018, 2019, these Case Companies changed their strategies, adjusted their structure of resources, and accordingly they reshaped their core competencies. To capitalize on the business opportunities arising from the ‘Belt and Road’ initiative launched by the Chinese government in 2013, Case 1 and Case 2 had invested in port operation and construction in five countries in four continents along the ‘Maritime Silk Road’. Case 3, Case 4, and Case 5 also had plans and investments in the ‘Greater Bay Area’ of the ‘Guangdong- Hong Kong-Macau Greater Area’ development plan. All these firms

have solid domestic operations that have facilitated their overseas operations. It is obvious that each Case Company had a priority to focus on new government policies and tried to capitalize on such opportunities. Since they are SOEs, they are strongly supported by their parent companies especially in terms of funds and policies. In addition, their port operating businesses are extensively supported by strategic resources, e.g., deep-water berths, terminals and warehouses. These resources enabled firms to provide extensive logistics services at home and abroad. However, international markets are turbulent; thus, these firms need to rebuild constantly their core competencies in order to maintain their competitive advantage in the market.

Two Case Companies emphasized on building logistics ecosystems, and all five Case Companies mentioned the digital transformation in operation. All eight Cases addressed the integration of domestic port resources, and they all emphasized the importance of the application of advanced technologies, e.g., 5G, internet, block chain, big data, and algorithms for digitalization of their operation. All five Case Companies claimed the application of such technologies to upgrade operating assets. In addition, they mentioned about overseas expansions for the general layout of ports in order to form global operation networks.

Core competence is a critical resource of firms' capability to capitalize on opportunities and to stay competitive. Regarding competitive competencies, the central idea is that firms should formulate their strategies and structures based on firms' core competencies (Nicolai and Dautwiz, 2010, p.876). To achieve this competitive advantage, it is the responsibilities of the senior management team to build core competencies and formulate company's strategies; yet, the task is challenging. First, Prahalad and Hamel (1990) pointed out that the merits of

competencies depend on the degree of their circulation and on the size of the resources base (p.87). Second, they argued that top managements of companies required the capability to mingle the technological and productions skills to achieve competencies and respond quickly to challenges or opportunities. However, the question remains that how these core competencies are built in the first instance.

Literature suggested that core competencies are built from firms' capabilities (e.g., collective learning) through the processes of coordination and integration of firms' resources (Prahalad and Hamel, 1990, p.81). Competencies must be subject to VRIN or VRIO tests to be sources of competitive advantage (Barry, 1991, pp.105-107). Based the literature review and the result of the analysis, this research holds the view that the success of building core competencies depends on three critical factors: (1) the effective mechanisms of coordination and integration of resources, (2) specific position about types of resources including tangible and intangible assets, (3) the building paths of core competencies.

5.3.3 Narrative cross-case analysis

The narrative analysis elaborated the results of the comparison on the results of individual Cases with Table Shells (Table 3 & 4). This type of analysis provides further elaboration about the results presented by the tabulated analysis (*table shell*) and the analytical framework (*data structure*). This comparison analysis compared two types of issues: the comparison of the results with the research questions, and the cross-cases comparisons. Four issues are highlighted below.

Findings and expectation

Based on the empirical data, the research questions were answered with the present

findings, leading to achieve the aim to understand and explain how Chinese MNPEs build their core competencies. Regarding the research questions of core competencies, the data covered four issues: (1) environmental critical events, (2) port resources, (3) operation and management, (4) building core competencies with resources. The first issue addressed the environment challenges and opportunities. The second issue covered the port resources in terms of geographical location, integration, layout, transformation, upgrading, and expansions. The third issue provided information about the operation strategy and the management activities. In addition, the third issue is about how these Case Companies build and deploy their core competencies in global context. Specifically, data shows that these Case Companies are just in the period of business transformation with ambitious plans to apply digital technologies in operation and management activities. The fourth issue revealed that Case Companies are building logistics ecosystems to enhance their core competencies by applying 5G, big data, and algorithms; thus, they would radically change their business patterns and the landscape of competition. Such data provide information about the paths to build core competencies through innovation in systems and business transformation with digital technologies. Further, these data show how technologies were applied to use resources. The findings set benchmarks to followers in Chinese logistics industry about how to build core competencies and what actions should be taken. Amid this historical moment of business transformation, the findings just kept up with times by providing the insights and foresights for business executives.

Similarities and differences of perceptions on key issues

Cross-case analyses were performed on Case Companies' perceptions on four key issues: critical events, resources, operation and management, and building core

competencies with resources. All these issues covered informationalized transformation in operation, integration of port resources, and the building of a logistics ecosystem. The reasons behind these changes are the availability of technologies, intensified competition, environmental challenges, restructuring of supply side and integration of port resources in China, and the changes of the layout of global ports. Such changes in the Chinese logistics industry respond the governments' initiative of 'Belt and Road' and the policies for 'Greater Bay Area' development.

First, regarding critical events, Case Companies had common views on certain environmental challenges and risks that affected severely their operations and development. The critical events include system risks such as the US-China trade dispute, geopolitical frictions, competition, stringent environmental protection policies, and the impact of Covid-19 pandemic. In addition, there were non-system risks or specific risks relating to individual firms, e.g., the improvement of infrastructure of public land transportation that will affect the water-way passenger ferry business of Case 3. However, development opportunities had emerged such as the favorable government policies of 'Belt and Road', 'opening-up' to foreign services enterprises, supply side structure reform, 'Greater Bay Area' development, and the construction of free trade zones in China.

Second, regarding resources, Case Companies own and control different resources and they possess different core competencies. These core competencies were reflected in capabilities in different business domains. The common functions, where core competencies could be observed, are the coordination and integration of firms' existing resources, the application of advanced technologies, and the innovation in

operation and upgrading of operation assets. Other specific core competencies were identified in the areas of communication with government authorities and the capability to identify and acquire core assets. All these views suggested that firms' core competencies were reflected in capabilities and supported by resources. Interviewee 3 of Case 3 made an inspiring remark that core competencies can be categorized into four types: the resources-based core competencies, the operational-based core competencies, the management-based core competencies, and the intellectual-based core competencies. Interviewee of Case 5 viewed that a firm needs different core competencies at different stages along its development path. These views revealed a dynamic and responsive nature of core competencies. By combining these two views, the view of 'Typology and Phase' on core competencies emerged.

Third, regarding operation and management, Case Companies adopted three approaches to build core competencies: (1) innovation in operating systems in terms of building a logistics ecosystem, (2) upgrading operating assets in terms of improving productive services of tangible assets, (3) acquisition and building strategic resources for domestic and overseas operations. The first approach refers to the transformation in business or development models and the coordination and integration of resources. The second approach refers to upgrading assets and the application of advanced technologies. The last approach refers to the knowledge and experiences in investment projects. Specifically, innovation means changes or improvements in operation and management such as extending operation to upstream and downstream of the industry chain, JV partnership, business cooperation, and building a logistics ecosystem. Upgrading assets refers to the application of technologies such as the utilisation of advanced machineries, increase of terminal

space, augmenting assets for productive services, and building informationalized, intelligent, and automatic ports. In operation and management, individual Case Companies adopted different strategic priorities:

- Case 1 emphasized building an informationalized logistics ecosystem and innovation. It also stressed on building a sound industry chain and supply chain based on VRIN assets.
- Case 2 emphasized learning from world-class benchmark enterprises, and it is the industry pioneer in the application of the 5G communication technology and the block chain electronic invoice technology in China.
- Case 3 emphasized on the upgrading assets to accommodate business transformation and consummating a sound industry chain and supply chain based on VRIN assets.
- Case 4 emphasized on enhancing quality of services and operating efficiency for customers and the sophisticated schedule of infrastructure development of ports.
- Case 5 emphasized learning from its JV partner for providing quality and efficient operation services.

Fourth, regarding building core competencies and the building of resources base of a firm, all Case Companies hold the similar view that core competencies building are closely related to the assets of firms. They considered that resources serve as the physical conditions for building core competencies. The data indicated that changes of strategies in Case Companies were triggered by critical events. Accordingly, such changes in strategies need to reshuffle resources to create core competencies. Further, data showed that Case Companies paid great attention to build and maintain their appropriate bases of assets by a variety of methods. Such methods include increasing or upgrading assets and the expansion of business at home and abroad. In practice,

Case 4 and Case 5 held the same view that before considering building core companies, a firm needs to understand their customers in the first place. All these five Case Companies mentioned the importance of VRIN assets and the efficient utilisation of resources. These Case Companies expressively pointed out that the values that customers pursued are ‘quality and efficiency’— the quality of service and the efficiency of port operations. Case 8 pointed out that the mission and the functions of a firm should encompass the building of core competencies. Accordingly, the task to build core competencies should take into consideration of assets, transformation, and the values of customers.

5.4 Other findings: main development trends of the Chinese logistics industry

The operations of Case Companies were affected by the development of the Chinese logistics industry. According to data of annual reports and in-depth interviews, three salient development trends were identified in Chinese logistic industry. These trends include (1) the integration of ports, (2) the informationalized transformation in operation and management, (3) the capitalization on the development opportunities arising from China’s ‘Belt and Road’ initiative and the ‘Greater Bay Area’ development in southern China. These development trends in the logistic industry are not necessarily synchronous, or subsequent, but related; and they affect the operation of Case Companies in terms of changes in competition, operation transformation, and development opportunities.

The first trend is the integration of ports in China, and it was initiated by local governments or by individual port enterprises. In southern China, river ports and coastal ports serry, and they compete for cargos from the same bases, creating

intensive peer competition. Since some of them are SOEs, Government authorities can direct mergers of some ports to avoid competition. Such merger projects had been carried out recently, but little progress was made because of complex ownership of these ports. SOEs' had completed some acquisitions of private-owned ports; however, merger activities by both private port owners seldom occurred. In coastal cities in northern China, integrations of ports were more popular than that in southern China.¹² The main reasons for integration of ports are the repeated construction of ports and the peer competition for same sources of cargo causing unprofitable operations. It is expected that this development trend will continue in northern and southern areas in China.

The second trend is the informationalized transformation of port operations. Currently leading port operators are engaging in operation transformation characterized by the application of new information and internet technologies including 5G, block chain, big data, and algorithms. In practice, Case 1 is now building a huge logistics ecosystem functioning by an informationalized operating platform upon which cross industry participants can converge for business. The participants include shippers, consignees, carriers, terminal operators, depot and storage services providers, insurers, and legal advisors. The operating platform is highly intelligent and based on big data and algorithms that provide participants with added values in terms of quality services, operating efficiency and cost-effective benefits. Case 2, Case 4, and Case 5 are undertaking projects to upgrade terminal operations from traditional routines to intelligent port operations, including 'smart port', 'E-port', and 'E-commerce' operations. Case 3 is now outsourcing R & D for upgrading its information and

¹² The major deal of integration of two ports in northern China was completed in 2014 and the merger was promoted by two local Governments. The total container throughput of the new merged entity was ranked top 4 in the world in 2018

management systems. The objectives of transformation are to provide quality services, operation efficiency, and costs benefits to customers. The employment of advanced technologies has made the integration of ports possible.

The third trend is that overseas mergers or acquisitions have become common business expansion activities along the 'Belt and Road' countries. Case 1 and Case 2 completed major acquisitions or investment projects in some countries in Europe, US, and Asia. Case 3 completed three overseas investments in Asia, with all projects being situated along the 'Belt and Road' development countries. These overseas expansion projects consummated their industry chains and supply chains, enabling Case Companies to arrange global layout of ports and shipping routes. The digital transformation of operation and management will facilitate these overseas operations.

The complex operating context of the Chinese MNPEs—in terms of features, formats, opportunities and challenges—caused strategic changes from traditional logistics operations to digital transformation in operation. This transformation is irreversible because of three drivers: (1) the globalization of the world economy, (2) the intensifying competition, (3) the availability of advanced digital technologies. However, this transformation is not an easy task for logistics practitioners as it involves radical changes in management, operation, and business models. It also means a need to educate and upskill employees, especially when terminal operations become automatic. The lack in qualified employees in the short-term is inevitable because such knowledge or skills may not be acquired in a short time. Hence, in this new context, it is important to identify the core competencies specifically the knowledge and skills for container shipping logistics to cope with the challenges in a globalised market (Thai and Yeo, 2015, p.337). It is expected that the digital

transformation in port operation may redefine core competencies by innovation.

Chapter 6 Discussion

This study explored the mechanism that Chinese MNPEs used to build their core competencies, and it identified those core competencies that Chinese MNPEs possess. The study revealed three main findings and two striking research topics for future studies. The main findings are (1) three generic core competencies of the Case Companies, (2) the conceptual framework of the Mechanism of Building Core Competencies (MBCC), and (3) three suggested paths to build core competencies. The two topics for futures studies are the view of ‘Typology and Phase’ (TP) of core competencies, and the view of ‘Optimal Portfolio of Resources’ (OPR). Three main findings read as follows:

- The Case Companies possess three generic core competencies: (1) the innovation in terms of business models and operation, (2) the utilisation of technologies, (3) the acquisition of strategic resources.
- The study developed a new conceptual framework—the Mechanism of Building Core Competencies (MBCC)—which is an eight-dimensional construct including *critical events, responsive strategies, knowledge, path-dependency, collective learning, sustainable processes, optimal resources assessment, and core competencies*. In addition, the study established the explanation to the generation of core competencies at the conceptual level.
- The study proposed three paths to build core competencies: (1) to enhance collective learning, (2) to select appropriate processes to utilise resources, (3) to build an optimal resources base. Regarding building resources base, the study recommended three methods: (a) acquisition, (b) configuration, and (c) building digital logistics ecosystem for business.

The study suggested two topics for future studies:

- the view of ‘Typology and Phase’ (TP view) of core competencies,
- the view of ‘Optimal Portfolio of Resources’ (OPR view) of firm.

The results of the analyses proved the validity and reliability of the research methods and the data collection instruments, which provided material facts and insights of the *reality* under study. The rich connotations of the eight dimensions of MBCC implied the depth of the analysis and the width of the research; and the rich concepts demonstrated interviewees’ experiences, knowledge, expertise, insights, foresights, seriousness, and commitments as well as supports to the study. Data were presented as facts or descriptive texts or statements of individual views and comments, and these data contained explicit or implicit information requiring investigator’s efforts to understand the exact meaning of such information. Accordingly, a sense-making process was involved because it required the knowledge, experiences, and professional background of the researcher to understand such meanings of data (Bryman and Bell, 2011). The data gathered were considered adequate, traceable, and testable; and they confirmed to the three criteria for selecting data: legality, relevancy, and authenticity. This Chapter presents the finding of three core competencies, the discussion of the conceptual framework of MBCC, and the paths to build core competencies. Lastly, it expounds topics for future studies.

6.1 Core Competencies of Case Companies

The first finding of the study is the three generic core competencies of Case Companies, which were included in the dimension of core competencies in MBCC. These core competencies of Case Companies are (1) innovation in business models and operation, (2) utilisation of technologies, (3) acquisition of strategic resources.

Such core competencies mean that Case Companies possess collective learning in innovation in business models and operation, in effective utilisation of resources, and in acquiring VRIN, VRIO tangible assets or intangible resources (Prahalad and Hamel, 1990, Barney, 1991, Barney 2010). By virtue of core competencies in innovation, Case Companies are building digital logistics ecosystems for business which radically change the operating context in the form of providing integrated logistics services. By virtue of core competence in effective utilisation of technologies, Case Companies are building digital platforms for business, and applying 5G, big data, block chain, and algorithms for automatic port operations. Finally, in terms of building core competence in asset acquisition, Case Companies are integrating domestic and overseas port resources, and overseas M & A projects. The researcher holds the view that these core competencies assured successful operation of Case Companies in three ways: (1) securing leading positions in the marketplace with entry barriers and immobility, (2) flexible operation strategies in using resources, (3) reliable resources support to business. The features of these core competencies are as the following:

- Data analysis indicated that core competencies of the Case Companies were characterized by innovation in business models and operations, and such core competencies were supported by huge strategic resources of Case Companies. Such core competencies established entry barriers and immobility that competitors may not be easy to imitate, therefore, securing SCA of Case Companies in marketplace.
- The present core competencies are derived from MBCC through the process of condition, inputs, process, and output. Case Companies acted intensively in response to complex global challenges by formulating targeting strategies to cope with challenges given knowledge, path-dependency, and resources.

- The data analysis showed that the interaction of these three core competencies secure the SCA of Case Companies. First, these core competencies secure SCA of Case Companies by launching technologically innovative business models, e.g., building logistics ecosystem. Second, such core competencies enable Case Companies to make responsive strategies with flexibilities choices to deploy resources. Third, such core competencies enable Case Companies sustain their optimal resources bases.

6. 2 The Mechanism of Building Core Competencies (MBCC)

The second finding of the study is the conceptual framework—the Mechanism of Building Core Competencies (Figure 9). It is a product of the synthesis of an array of theories and the results of analyses of data. The formulation of MBCC drew on three main theories or concepts: the RBV (Penrose, 1959; Wernerfelt, 1984; Barney, 1991) in terms of resources, the core competencies (Prahalad and Hamel, 1990) in terms of collective learning and process, and the dynamic capabilities (Teece et al. 1997) in terms of process, assets positioning, and path-dependency. In addition, the research applied other theories in formulating MBCC, including collective learning (Capello (1999), cognition (Lektorskii,2010), organisational learning (Crossan et al., 1995; Wilkens et al., 2004), knowledge theory (Turvani, 2002; Conner, 1991; Day, 1994; Grant, 1996; Wilkens et al.,2004; Edgar and Lockwood, 2011), and core competencies building (Sanchez et al.,1996). Further, the method to analyse dynamic capabilities was applied to decompose the definition of Prahalad and Hamel (1990) for the decomposition framework (Kituchi and Iwao, 2016, 141). All these theories or concepts address the sources of SCA. Specifically, the dynamic capability framework was important in analyzing and explaining the sources and methods that can be used

to achieve economic rents in a turbulent business environment (Teece et al., 1997, p.509).

Guided by the decomposition framework (Figure1), the researcher synthesized the results of the analysis of the data and developed the conceptual framework of MBCC (Figure 9), which consists of eight dimensions and 33 themes (Figure 8 & Table 4). The principles and evidence for logically binding these eight dimensions together were the three main theories or concepts and the data. Such principles and evidence are the RBV of Wernerfelt (1984), core competencies of Prahalad and Hamel (1990), the dynamic capabilities of Teece et al. (1997), and the data of in-depth interviews and annual reports. The dimensions and themes are the concretized expressions of the concept of MBCC. It is a process developed from the data to understand and explain the dynamics of core competencies of Case Companies. As it shows that organizational processes can be used to explain the essence of a firm's dynamic capabilities and its competitive advantage; if such processes are determined by its resources base and its development paths (Teece et al.,1997, p.518). The MBCC (Figure 9) explains the relationships among these eight dimensions and the process of the generation of core competencies supported by those three theories or concept noted above. MBCC has two main attributes: (1) it is responsive to internal and external critical events, (2) it is flexible in selecting utilisation processes of resources. MBCC is a responsive, flexible, and practical tool to manage core competencies.

MBCC is a process of changes of collective learning in effective and efficient utilisation of resources of a firm in response to critical events. In other words, MBCC is a responsive mechanism to build core competencies of a firm given an optimal resources base the firm owns or controls. As a mechanism, MBCC has its form,

logical relationships, operation mechanism (dynamics of dimensions), and the trigger mechanism (rationale of generation of core competencies):

- MBCC has its form structured with eight dimensions (Figure 9).
- MBCC has its contents appeared as themes and concepts, and such contents were presented in data structures and table shells.
- The logical basis for building MBCC is the causal relationship between resources and SCA.
- The operational mechanism of MBCC refers to how the *soul* (collective learning) functions and the interplay among eight dimensions..
- The trigger mechanism of MBCC refers to when and how MBCC is activated.

6.2.1 The form and the contents of MBCC

MBCC consists of eight dimensions connected with symbols and arrows: the *critical events*, *responsive strategies*, *knowledge*, *path-dependency*, *collective learning*, *sustainable processes*, *optimal resources amassment*, and *core competencies*. Each dimension has rich connotations in terms of themes and concepts (Figure 8, Figure 9, Appendix 3, Table 4, and Table 12 of Appendix 4). MBCC focuses on two issues: the dynamics of individual dimension and the interaction of dimensions. The issue of dynamics of dimensions concerns about the functions and relationships among each dimension, and the issue of interaction refers to the process of generating core competencies. Generally, MBCC can be divided into four parts: the condition, the input, the process, and the output. In MBCC, the last two parts of the process are similar to the decomposition framework (Figure 1). However, MBCC has four additions to Figure 1: *critical events*, *responsive strategies*, *knowledge*, and *path-dependency*. MBCC is presented as below:

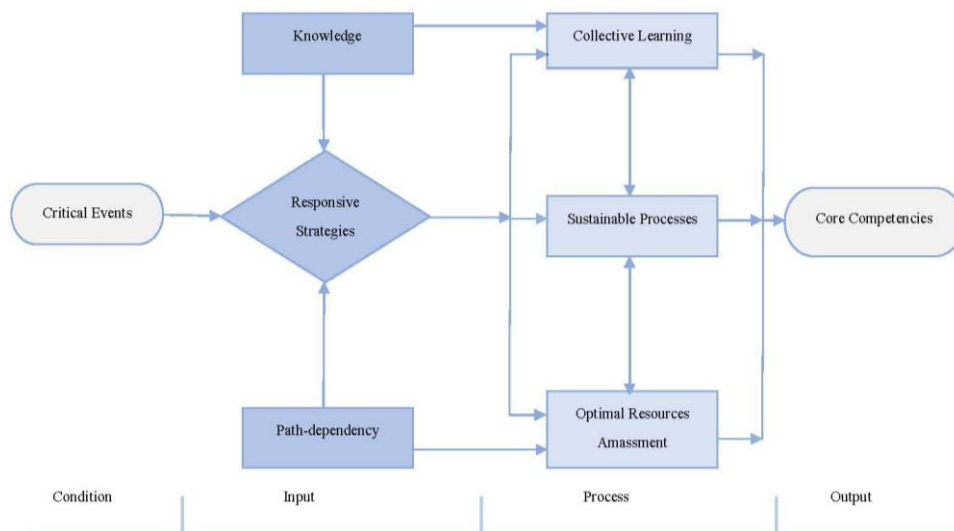


Figure 9 Conceptual framework of the Mechanism of Building Core Competencies (MBCC)

Figure 9 depicts key relationships among dimensions of MBCC: (1) the relationship between the dimensions of *critical events* and *responsive strategies*, (2) the relationships among *responsive strategies*, *knowledge*, and *path-dependency*, (3) the relationships among *collective learning*, *sustainable processes*, and *the optimal resources amassment* with *core competencies* as the output. Figure 9 also illustrates that MBCC consists of four parts as a process: condition, input, process, and output.

6.2.2. Logical basis for building MBCC

The development of MBCC was based on the logical relationship between the core competencies and SCA. Prahalad and Hamel (1990) affirmed that managerial capabilities to consolidate firm technologies and skills into core competencies are the sources of SCA; and such core competencies enable firms to cope with the changing environment swiftly (p.81). Further, Prahalad and Hamel (1990) argued that, in the long term, SCA derives from managerial capabilities to build core competencies

effectively and efficiently. Furthermore, firms achieved SCA by employing strategies that consolidate internal strengths through coping with the environmental challenges and opportunities quickly (Barney, 1991, p.99). These assertions laid down the basis for the formulation of MBCC. Based on these assertions, important theoretical dimensions necessary for building the mechanism were emerged, including managerial capabilities, mechanism, resources, core competencies, and critical events. From the building mechanism perspective, the researcher combined additional dimensions, which were emerged from the literature, i.e., critical event, strategy, knowledge, and path-dependency. The analysis on data gathered provided evidence of the additional emergent dimensions: *critical events* and *responsive strategies*. Thus, MBCC was developed from the results of the analyses on data with theoretical support.

Several scholars have established the link between resources and SCA. Barney (1991) examined rigidly the link between firm resources and SCA (p.99), and he pointed out that valuable firm resources are sources of SCA (Barney, 1991, p.106). Valuable resources refer to the resources that enable a firm to implement strategies that can enhance performance effectively and efficiently (Barney, 1991, p.106). Resources become strategic only when they can exploit opportunities or neutralize threats (Barney, 1991, p.106). Prahalad and Hamel (1990) claimed that competencies are critical and required in order to compete in industry (p.81). Aaker (1989) asserted that a firm's SCA is based on firm's assets and or skills (p.91). In addition, he posed that the essence of strategic management is to build an adequate asset base and skills resources, and the formulation of strategies for a specific environment (p.91). Aaker (1989) also pointed out that such assets and skills constitute a firm's SCA (p.91). Further, Mascarenhas et al. (1998) posits that knowing the core competencies of a

firm enable to formulate strategies (p.17). Although, the data gathered from in-depth interviews assured the researcher to conclude that VRIN assets in core geographical locations secure the domain positions of Chinese port operators in both contexts of international and domestic operations. Yet, the link between a firm's resources and the SCA is still causally ambiguous (Barney, 1991, p.107).

Some previous studies suggest building core competencies from the aspect of intangibles resources regardless of tangible assets; while RBV suggests that core competencies building can appear in different forms. Barney (1991) and Wernerfelt (1984) suggest building competence through developing tangible assets, while Prahalad and Hamel (1990) and Sanchez et al. (1997) suggest creating core competencies through developing and integration of intangible assets and capabilities. Prahalad and Hamel (1990) affirmed that outsourcing and alliance strategy can provide an efficient way to access more competitive services or products. Further, acquisition is a mechanism to reconfigure firms' existing resources and to obtain unique resources (Karim and Mitchell, 2000, p.1061). These different approaches to acquire resources aim to achieve core competencies. Nevertheless, it is obvious that core competencies are derived from collective learning processes involved in four dimensions of utilisation of resources (Figure 1). In fact, competence building also involves the process of creating new strategies. Sanchez et al. (1996) defined core competence building as a process that changes firms' existing stock of assets and capabilities or creates new capabilities to coordinate and deploy new or existing assets and capabilities so to achieve its goals.

6.2.3 The dynamics of dimensions of MBCC

The dynamics of *dimensions* constitute the operational mechanism of MBCC. Rouse and Daellenach (2002) depicted that tangible and intangible resources are converted into sociotechnical processes to generate core competencies, and such core competencies become sources of SCA to maximize operational performances (p.966). According to Penrose (1959), the change in managerial function and duties change the productive services of other resources, therefore, the changes of existing operation of a firm (p.74). The relationship between sustainable competitiveness and business performance is that sustainable competitiveness composed of business strategy, leadership of core products, and innovative products; and such sustainable competitiveness result in firms' excellent operational performance (Yang, 2015, p.173). Best (2002) ascertained that a firm's capability were built in mutually interdependent inter-firm processes that involve concurrently resource coordination and capability creation (p.186). In addition, this study drew on theories including RBV, core competencies, dynamic capabilities, organisational learning, and knowledge management to form the theoretical foundation for the study. These concepts and theories helped identify dimensions and establish relationships among emerged dimensions for developing the conceptual framework of MBCC.

Critical events and responsive strategies

The first two dimensions are *critical events* and *responsive strategies*, and the results of data analysis indicated that their relationship is causal (Figure 9 and Appendix 4). Critical events are any instigating events that are sufficiently accountable for causing the need to make a new strategic decision, and they can be either exogenous or endogenous. Results of the data analysis show that the dimension of critical event has two themes: exogenous critical events and endogenous critical events; and it has rich

connotations as concrete critical events (Table 4, Figure 8 and Table 12 of Appendix 4). Specifically, interviewee 2 of Case 3 viewed that any changes in corporate strategies are the results of the impacts of the markets, and the data in annual reports of the five Case Companies provided evidence that firms change their strategies of marketing, operation, investment, or development in response to business environment changes (Table 12 of Appendix 4).

The most salient strategy change is the digital transformation in operation adopted by these five Case Companies. Especially, Case 1 is now undertaking an ambitious plan to be the leader in digital transformation of operation in global logistics industry. The causes of this strategic change were mainly five environmental events: (1) the changes of the landscape of global business competition, (2) the changes of the globalization of the world economy, (3) the changes of geopolitics, (4) the availability of digital technologies, (5) the governments' policy support in China (Table 12 of Appendix 4). As interviewee 2 of Case 3 affirmed that these changes are the critical factors that may affect survival and prosperity or even cause misfortunes to firms. In addition, the interviewee of Case 4 pointed out that a firm should study the market, stay conscious of the changes of market situations, and make predictions of changes in advance. Further, interviewee 2 of Case 3 pointed out that the formulation of corporate strategy is market oriented in nature. Regarding the endogenous critical events, they may include changes of members of management team, corporate restructuring, the impairment of major operating assets, or financial distress. The causal relation between these two dimensions, critical events and responsive strategies, suggests that firms should keep close surveillance on environmental changes, take proactive measures to cope with environment challenges, and enhance management.

The dimension of responsive strategies has five themes: (1) global marketing, (2) enhancing management, (3) intensifying operation, (4) transformation and innovation, and (5) capitalizing on opportunities (Table 4, Figure 8 and Table 12 of Appendix 4). In practice, Case Companies used different strategic analytical tools in strategic management. For example, the interviewee of Case 4 mentioned that they applied the Five Forces model (Porter, 1995) and the SWOT analysis tool of Andrews (1971) in their strategic decision making process. These considerations established the relationship between critical events and strategic decisions. The reasons of the inclusion of such tools are that such strategic analyses involve the environmental analysis (Porter 1980) and internal resources analysis. In addition, the firm's management adopts strategies to utilise their strategic resources to act responsively to changes (Barney, 1991, p.99). Core competencies are a firm's valuable resources and the basis for formulating competitive strategies; therefore, the building of core competencies is an essential task of the management in decision-making. Critical events and responsive strategies are deemed as the conditions and inputs in MBCC (Figure 9).

The role of knowledge

The dimension of *knowledge* includes three themes: (1) knowledge management, (2) experience, (3) cognition (Table 4, Figure 8 and Table 12 of Appendix 4). The inclusion of the dimension in MBCC was substantiated by data and literature. Because a knowledge process could be a source of core competencies, it helps increase the ability to cope with future challenges (Wilkins et al., 2004, p.23). This knowledge is also an intangible resource as well as a causal ambiguity conversion process in building core competencies (Wilkins et al., 2004, p.23). While core competencies are embedded in the structure of knowledge of a firm (Edgar and

Lockwood, 2011, p.62); such knowledge is derived from cognition and learning as suggested by the data. Specifically, the knowledge management view suggests that knowledge is a critical resource for the firm (Conner, 1991; Grant, 1996), and 'the knowledge gained through collaboration is a valuable asset and can be a source of competitive advantage' (Day, 1994). The relationship between knowledge and collective learning can be explained by the fact that experience develops incremental knowledge of a firm in term of recognizing productive opportunities, and such new knowledge causes a firm to change (Penrose, 1995, p. 53). Accordingly, knowledge significantly influences collective learning and responsive strategies in terms of exploiting existing knowledge and accumulating new knowledge through learning.

By the definition of core competencies of Prahalad and Hamel (1990), integration and coordinating mean processes or mechanisms to create core competencies; however, the missing part is the link between knowledge and the learning process. Regarding the composition of core competencies, Daud, Ismail and Omar (2010) illustrated the iceberg model of competencies. The model consists of six characteristics of competencies. It shows that the knowledge is at the top of surface part, the skill at the middle part of the surfaced iceberg, and the social role at the water level. It further suggested that the self-concept and trait, and the motive were beneath the sea surface, and the motive at the bottom of the iceberg (Spencer and Spencer, 1993, p.40). Knowledge and skills are visible competencies and can be observed and measured, while other four characteristics are less visible and observable (Daud et al., 2010, p.40). Motives, trait, and self-concept competencies influence skills and actions. In turn, knowledge and skill competencies affect motives, trait and self-concept competencies. As knowledge and skills affect performances, other four types of competencies influence drives to deploy knowledge and skills (Daud et al., 2010,

p.40). In addition, knowledge creation is realized through interaction of learning, mental systems, and processes. Finally, core competencies are deemed as the results of collective learning processes, and they reside in business activities and processes (Hafeez et al., 2002, p.29).

The role of path-dependency

The dimension of *path-dependency* consists of four themes: (1) vision and mission, (2) development strategy, (3) government directives, and (4) basis of decision (Table 4, Figure 8 and Table 12 of Appendix 4). This dimension suggests that the decision-making process is influenced by path-dependency through these four themes. Generally, the influence was salient in decision-making process for strategic development and operation at cooperate level. Specifically, it suggested that the performance of a firm was influenced by the path a firm historically pursued. As the firm obtained valuable and rare resources, it can exploit these resources accumulated over time to implement value-created strategies (Barney, 1991, p.108; Karim and Mitchell, 2000, p.1068).

Since Case Companies are key SOEs in China, they commit to their visions and missions, and they follow the government directives from time to time. In practice, Case Companies may capitalize on the opportunities arising from Government policies such as the overseas strategy of ‘Belt and Road’ initiative and the development plans in ‘Greater Bay Area’. This practice may influence the development path of firms ahead because Case Companies will adhere to their core business and seldom enter into entirely new business domains. In addition, this dimension affects strategic decisions, collective learning, processes, and firm resources. The acquisition of a firm's resources may depend on the historical position

of the firm over time; for example, a firm acquired an additional important tangible asset in a precious geographical location (Barney, 1991). The services of such tangible assets with their unique geographical locations may determine the path for future development of the firm (Barney, 1991, p.108). A firm's performances also depends on the historical path followed by the firm as without such, a firm may not acquire particular resources for execution of specific strategies (Barney, 1991, p.108). Obviously, path-dependency affects corporate strategic decisions, cognition and learning, and firm resources (Figure 9). Further, path-dependency may function as the stabilizer to keep the correct bearing for firm development.

The interaction of the three core dimensions

The core dimensions of MBCC (Figure 9) are *collective learning*, *sustainable processes*, and *optimal resources amassment* appeared as the processing part of the building process of core competencies. The interaction of these three core dimensions generates core competencies, whereby the essence of core competencies is embedded in collective learning in coordination of production skills or integration of technologies. It is also about the organization of work and the delivery of value (Prahalad and Hamel, 1990, p.82). Core competence further means communication and commitment to working activities in a firm; and it engages with various levels of people across all functions in a firm (Prahalad and Hamel 1990, p.82). Prahalad and Hamel (1990) suggested that collective learning, processes, and resources are the core elements and the interplay factor is the communication (p. 82). These insights give rise to further thoughts about the nature of core competencies; where this study has reorganized the interpretation of the definition. By linking the concept of core competencies and the *reality* of the subject of the study, the researcher restructured the concept into three components: first, the capability, which refers to collective

learning; second, the process, which refers to the coordination, integration, organization, and delivery; and third, the resource, which refers to production skills, and technologies. Accordingly, the communication function involved in the building of core competence was regarded as the interplay factor linking all three core dimensions together. In this way, the reorganization of the four dimensions constituted the originating mechanism of the MBCC, Figure 9. Accordingly, the terms used in the definitions of Prahalad and Hamel (1990) were changed by using *sustainable processes* collectively for coordination, integration, organization, and delivery; and *optimal resources amassment* for skills and technologies. The reasons to change the usage of Prahalad and Hamel's (1990) terms are the expanded connotations of those terms found in the data (Table 4, Figure 8 and Table 12 of Appendix 4). This new interpretation of the definitions of Prahalad and Hamel (1990) allowed the researcher to focus the study on capabilities, processes, and resources; which are the three main areas of companies' management activities as well.

The role of collective learning

The first core dimension of MBCC is *collective learning*. It is the essence of core competencies and the *soul* of MBCC. Without it, core competencies will be extinct. According to Prahalad and Hamel's (1990) definitions, among those three core dimensions, the most important one is collective learning because 'collective learning is as social process of cumulative knowledge, based on a set of shared rules and procedures which allow individual to coordinate their actions in search for problem solutions' (Capello, 1999, p.354/s162). 'Collective learning is also deemed a determinant of innovative activities in high technology milieu' (Capello, 1999, p.367/s171). By combining the definitions of Prahalad and Hamel (1990) and the assertion of Wilkens et al. (2004), the researcher proposed that collective learning

includes knowledge gaining and the learning processes, which are shared by organisational members. The reason is that learning is a process of repeated and trial activities that enables accomplishment efficiently (Teece et al., 1997, p.520).

It is important to understand the concept of *collective learning* in order to understand the process of building core competencies. Analyzing the collective mental patterns of employees of an organization is a way to explore the important processes for generating core competencies (Wilkens et al., 2004, p.8). Based on the data of the study, this dimension also includes cognition. As Lektorskii (2010) posited that ‘perception interpreted as an active process of extracting information presents to the subject the qualities of the external world itself that correlate with his needs’(p.34). Lektorskii (2010) also pointed out that ‘individual cognition is interpreted as a component of the collective cognitive process’ (p.36). Further, ‘the reality is identified and actualized for the subject only through his constructive activity’ (Lektorskii, 2010, p.38), and it required humans’ interpretations to the reality. Reality must be interpreted as multilayered and multilevel; and different levels are not reducible to one another, although there are dependent relationships between them’ (Lektorskii, 2010, p.39). Data gathered from interviewee 2 of Case 1 and the interviewee of Case 5 suggest that cognition proceeds learning; and cognition and learning mutually promote. Perceptions of the need to learn give rise to learning; in turn, learning accumulates knowledge and increases capability. As the interviewee of Case 5 affirmed that cognition came before learning because the perception of the need to learn something drives learning activities. Case 6 supported this view that the successful operation of Case 5 was attributed to the effective learning from its equity JV partner, which is the outstanding port operator in the world. By joint venture, Case 5 was able to recognize their deficiencies in operation and management, especially

through exchanges of management visits with major overseas operators in US and Europe and other places in the world. Case 5 became the largest single port area operator in the world; and currently, it is able to replicate its development strategies, management systems, and operating routines in new port investments in other places in China.

Collective learning can be enhanced in three ways. The results show that *collective learning* has five themes and extensive supporting concepts. These themes include: (1) management capabilities, (2) E-commerce thinking and practice, (3) Enhancing learning, (4) learning method, (5) cultural influence (Table 4, Figure 8 and Table 12 of Appendix 4). In addition, collective learning is influenced mainly by three factors: (1) education and training of employees, (2) qualities of top management team members, (3) the knowledge gained from the application of utilisation of resources. First, enhancing management capabilities is an important way to build core competencies. Data showed that scarce capability because of high turnover of members of management team created inconsistency in strategic decision making in terms of development, investment, operation, and management. As one of interviewees of Case 3 noted that the characters of the management team members and their diversity of decision-making style may cause a discordant decision making atmosphere. In addition, cognition and learning were given expressions on the members of the management team; therefore, the synergized composition of management team should be considered. Specifically, their professional background, knowledge about the industry and characteristics should be evaluated; as these characters constitute collective perceptions and learning that influence strategic decision-making process. Second, Government support helps promote the development of local logistics industry. In practice, Government agencies support the industry in the way of

promoting professional education and vocational training for young talents and managerial practitioners. The interviewee of Case 8 mentioned that the local Government sponsored their training programs by subsidizing trainees financially, and they supported local professional logistics training organizations to launch nationwide or international campaigns in skills competitions and the exhibition of logistics technologies. Finally, these learning activities inspire the thinking and expand vision of trainees. Therefore, collective learning in terms of cognition and learning should be taken as the critical one of these three core dimensions.

The effect of sustainable processes

The second core dimension of the MBCC is the *sustainable processes* with its origin from the dimension of process of the definition of Prahalad and Hamel (1990) (Figure 1). The term sustainable processes means that these processes are generally used by business at large. This dimension has four themes: (1) integration, (2) cooperation, (3) cooperation, (4) transformation & innovation (Table 4, Figure 8 and Table 12 of Appendix 4). According to Prahalad and Hamel (1990), core competence involves four processes to utilize resources, namely coordination, integration, organization, and delivery. The first three relate to the utilisation of resources, and the last one relates to the satisfaction of customers. The researcher discovered a new process to replace the process of delivery in that definition. This new process is a mixture of those four processes in the definition, and this hybrid method is called transformation and innovation. Again, the process was reorganised based on Prahalad and Hamel's (1990) definitions. That means that, in the case of MBCC, this dimension includes four main themes of process, i.e., coordination, integration, organisation, and transformation and innovation. Finally, all these themes were categorized into the dimension of sustainable processes.

In practice, Cases Companies employed a variety of methods to deploy their resources. Case 1 is the best example, as the firm is now taking the radical transformation from a traditional shipping enterprise into an integrated global logistics services provider. The firm adopted a new operation model characterized by the application of advanced digital technologies of 5G, internet, block chain, big data, and algorithms. The traditional competition model in terms of quantity or price will be changed to competition on big data and algorithms. Currently, Case 1 is building an integrated logistics ecosystem wherein participants from across the industries will converge and engage in business (Moore, 1993, p.76). The ecosystem is run by a highly digitalized platform providing full range of logistics services from trade, shipping, terminal cargo handling, warehousing, and delivery at destinations. It is highly informationalized operation capable to connect all interested participants in the industry including customers, shipping lines, port operators, Customs, and auxiliary services providers that include insurance, banks, and legal agencies. This ecosystem aims at global operation contexts for the purposes of providing values to customs and participants in terms of service quality, operation efficiency, and costs benefits. Case 2 established a subsidiary research institution to engage intelligent technologies to operation and management. Case 3, Case 4, and Case 5 follow suit on this development trend but on less intensive scale. This innovative process applied to the transformation in operation and management models, not just the process of utilisation of resources; thereby, this process is called innovation. Obviously, the running of the digital operation platform for the ecosystem requires a variety of processes more than the traditional processes of coordination, integration, organisation of resources, and the delivery of values as proposed by Prahalad and Hamel (1990).

The salient feature of the logistics ecosystem is the large scale of cooperation among logistics players. Within the logistics ecosystem, the important thing is the building up of inter-firm relationships, where Relation View of the firm (RV) was used to explain the Knowledge-based view (KBV) (Nix and Zacharia, 2014, p.248). Most importantly, RV asserted that shared learning and knowledge are obtained through inter-firm relationships. Successful firms regard themselves as members of business ecosystems, rather than an isolated member of an industry because successful companies need to build their core competencies through collaborative networks across multiple and related industries (Moore, 1993, p.76). Since competition and global economy are changing rapidly, the issues of inter-firm relationships become even more critical to be addressed to respond to the changes from marketplace (Nix and Zacharia, 2014, p.248). When firms interact to combine knowledge from inter-firm relationships, the synergistic effects of the combined resources become a source of SCA. It means that inter-firm relationship contributes as the source of SCA (Dyer and Singh, 1998, p.674). This synergistic effect of logistic ecosystem is the primary driving motive for building such logistic ecosystem.

The effect of optimal resources assessment

The last core dimension of MBCC is the *optimal resources amassment*, which addressed the building of resources base. The purpose of the management activities for optimal resources amassment is to maintain a desired portfolio of operating assets, resources, and a productive labor force to provide productive services. With reference to the definition of Prahalad and Hamel (1990), this dimension refers to the resources base of a firm that provides productive services for production, operation, and management activities. This dimension has five themes: (1) purpose, (2) criteria, (3) typology, (4) configuration, (5) construction window (Table 4, Figure 8 and Table 12

of Appendix 4). It requires a variety of activities including configuration, acquisition, maintenance, upgrading, disposal, and adjustment; and it concerns typology, criteria, evaluation, and leverage of such resources. The data show that the common types of Case Companies' resources include VRIN assets (rare geographical locations of terminals), heavy assets, technologies, operation and management systems, information systems, and balanced portfolio of other resources (Table 12 of Appendix 4). Resources are eventually consumed, depreciated, and utilised for production purposes; therefore, to build optimal resources base deserves imperative managerial attention. Further, resources are the material conditions for a firm's business and the basis for formulating strategies.

The composition and management of resources are closely linked to the profitability of a firm. Products or services of a firm require the inputs of certain resources, and different resources can be deployed in certain production or services (Wernerfelt, 1984, p.171). By judging the scope of a firm's operating activity in different markets, it is possible to infer the probable resources commitments; and by specifying a resources portfolio, it is possible to find the approximate operating spectrum (Wernerfelt, 1984, p.171). This means that the scope of the business is limited by resources a firm possesses over time. Wernerfelt (1984) pointed out that the traditional concept of strategy is derived from a firm's resources position in terms of strengths and weaknesses (p.171). This assertion also means that a firm's resources position determines their profitability (Wernerfelt, 1984, p.171). In this regard, RBV can be regarded as the analytical tool to examine the relationship between profitability, resources, and the ways to manage resource position of firm over time (Wernerfelt, 1984, p.171).

Empirical studies shows that incremental distinct resources help build core competencies. First, larger portfolio of resources gives greater degree of freedom to coordinate or integrate resources. Second, learning, skills, and the accumulation of knowledge on resources allow firms to operate effectively and efficiently. Third, it is possible to change one's products or services, just not to change one's competence; and 'the value of core competences can be enhanced by combination with appropriate complementary assets' (Teece et al., 1997, p.516). The coordination and integration of resources and learning will be more effective if similar resources are maintained (Karim and Mitchell, 2000, p.1068). Both theories and business practice are generally consistent in that strategic resources are the prerequisites for formulation strategies (Wernerfelt, 1984). This view suggests the value of resources to responsive strategies and the linkage between material conditions and the building of core competencies. Further, the dimensions of the mechanism (*collective learning, knowledge, process, and skills*) affect each other iteratively creating complex internal dynamics within the process of generating core competencies (Edgar and Lockwood, 2011, p.78). Accordingly, this dimension (*optimal resources amassment*) suggests a variety of concrete methods to build optimal resources base, including building digital logistics ecosystem and strategic oriented integration of resources (Figure 8 and Table 12 of Appendix 4).

Core competencies as the outcome of MBCC

The *core competencies* dimension as the outcome of MBCC has five themes: (1) embodiment, (2) building path, (3) typology, (4) relationship, (5) development phase. It can be deemed as the goal of the process of developing core competencies when MBCC is used in planning core competencies. It can be also deemed as the starting point when looking backward to examine the existing core competencies of a firm.

Taking the prospective view, it suggests three paths to build core competencies: *collective learning*, *sustainable processes*, and *optimal resources amassment*. It means that changes occur when plans or actions are taken through any one of these three paths or all of them at the same time. Taking the retrospective view, it helps to examine the strengths and weakness of the existing core competencies, and it suggests rectifications. Tables 4 and 12, and Figures 8 and 9 provide concrete methods used by Case Companies to build their core competencies (Table 4, Figure 8, Figure 9 and Table 12 of Appendix 4).

6.2.4 The rationale of MBCC

MBCC depicts the form and the dynamics of dimensions, the directions and paths of changes, and the causes and effects among dimensions, thus leading to the changes of core competencies. In MBCC, collective learning is the *soul* in generating core competencies. Regarding trigger mechanism, MBCC recognizes the complex interaction of individuals, skills, and technologies; and it addressed the importance of learning and path-dependency in the process of generating core competencies (Scarborough, 1998, p.229). The service of MBCC can be explained from two aspects: the operation of the mechanism itself in terms of the interaction of dimensions, and the attributes of each dimension. These four parts of MBCC constitute the building mechanisms of core competencies (Figure 9). The conditions are the critical events that instigate the need of change in strategies. The process part is the processor that completes the transformation of *collective learning*, *sustainable processes*, and *optimal resources amassment* through interaction of these three core dimensions with the influence of responsive strategies, knowledge, and path-dependency as the input. The last part of the process is the output as the results of the building mechanism. Similar to the *decomposition framework* (Figure 1), MBCC illustrates that the

interaction—among collective learning, sustainable processes, and optimal resources amassment—was activated by responsive strategies in response to critical events, eventually resulting changes in core competencies. In other words, MBCC explains that changes in core competencies occur imperatively through building processes when critical external and internal instances emerge. Therefore, MBCC is also called Responsive Building Mechanism of Core Competencies (RMBCC), and it suggests that core competencies are generated through the interaction of collective leaning in efficient processes of utilizing resources. Such interaction is dependent on corporate strategic decisions. However, changes in strategic decisions are triggered by critical events, based on knowledge, moderated by path-dependency, and supported by resources base of a firm.

6.2.5 Evaluation of core competencies

The purpose of building core competencies is to enhance capabilities (demonstrated by corporate routines) to obtain SCA for achieving economic rents. One of the three distinct characteristics of core competencies is that ‘a core competence should make a significant contribution to the perceived customers’ benefits of the end products’ (Prahalad and Hamel, 1990, p.84). Accordingly, a question emerged that how to evaluate core competencies. Another question was that ‘how central is this core competence to perceived customer benefits’ (Prahalad and Hamel, 1990, p.89). Data show that two approaches to evaluate core competencies of a firm: one is from the customers’ side and the other is from the corporate side.

These two approaches are two sides of the same coin. On the one hand, end products or core products of a firm are physical embodiments of core competencies (Prahalad and Hamel, 1990, p.83, p.85). This means that customers judge core competencies by

assessing values of products or services they perceived. According to Case 4, ‘quality services, efficient operation, and reasonable prices are the values we deliver to customers’ (see p.325). According to Case 5, “We aim to provide [service] customers with quality and efficiency in services’ (see p.331); ‘The values we delivered to our customers are service quality and operating efficiency’ (see p.331). These statements indicate that customers judge values and benefits of services in terms of ‘quality, efficiency, and cost-effectiveness’. The five Case Companies are aware of these criteria used by customers to assess core competencies of a firm, and they keep close surveillance on the needs and demands of customers and the market conditions. On the other hand, Case Companies evaluate operation results in terms of certain performance indicators including KPI at operational level and corporate level. Specifically, the management teams apply profit margin, net profit margin, market share, intellectual properties, brand acceptance, ROA, and ROE at management level with a prospective view (see p.142). The criteria for such evaluation are the industry average indicators. These two approaches of evaluation of services refer to the same thing—the benefits of the services to both customers and suppliers.

6.3 Paths to build core competencies

The third finding of the study is the paths to build core competencies. MBCC suggests that core competencies are built through the interaction among collective learning, processes, and resources; and changes in core competencies are initiated by critical events, judged by strategic decisions, based on knowledge, and influenced by path-dependency. This assertion is based on two propositions. First, resources should be strategic resources with the attributes of VRIN. Second, resources are heterogeneous and immobile. From the epistemological perspective, learning and knowledge are also influenced by path-dependency because sharing related

knowledge enhances learning (Karim et al., 2000, p.1068). MBCC shows that core competencies can be built by resource redeployment and routines reorganization because any change in these areas will effect changes in learning. Core competencies also originated from cognition, which determine actions. The interviewee of Case 5 argued that cognition must be recognized and accepted, and it involves adoption, assimilation, accommodation, and internalization. However, the relationship between cognition and recognition is not equal. For example, if one has the cognition and learning, and he or she could not realize it; it is still not recognized. Therefore, one needs the process to use resources to realize one's cognition and learning. Cognition should be realized through an action plan; only by this way, one can succeed (Table 10 of Appendix 4). The interviewee of Case 5 further provided a practical example of path-dependency that his firm is doing replication in investment projects, which is the 'one port, one city, and one host' model.

The decomposition of the concept of core competencies (Figure 1) shows that core competencies are the collective learning in the processes of utilizing resources. As Hafeez et al. (2002) asserts that core competencies are deemed as the results of collective learning processes, and they reside in business activities and processes (Hafeez et al, 2002, p.29). This statement means that any changes in collective learning will effect changes in core competencies because core competencies are the collective learning in coordination or integration of resources including skills and technologies (Prahalad and Hamel, 1990, p.82). It also means that the knowledge and the capability of learning enabled the management to deploy purposively constructed portfolios of resources to accomplish designated strategic goals through specific methods. In other words, collective learning in process initiates the utilisation of certain resources to achieve desired goals. In practice, the data showed that Case

Companies undertake a variety of innovative measures to elevate operation and to enhance management in both processes and resources (Figure 8 & Table 12 of Appendix 4). MBCC is a pledged mechanism that suggests ways to rebuild core competencies when critical events occur. It means that when certain critical events occur, practitioners can examine or rebuild their core competencies through three paths, which are to influence collective learning or sustainable processes, or to readjust the resources portfolio.

6.3.1 The responsibilities of the management to build core competencies

The management team's responsibilities are three folds for building core competencies. First, core competencies do not come out automatically. The building of core competencies needs efforts, resources, time, and most importantly, the commitment of the top management team. Second, it is the obligation of the top management team under the principle of agency relationship. Third, the top management team has the appropriate authority to utilize a firm's resources. Since the purpose to build core competencies is to achieve SCA, and the purpose to develop MBCC is to build core competencies of a firm. Naturally, the management team of a firm should take such responsibility to build core competencies. As literatures suggests 'top management's real responsibility is a strategic architecture that guides competence building' (Prahalad and Hamel, 1990, p.91). 'We believe an obsession with competence building will characterize the global winners of the 1990s' (Prahalad and Hamel, 1990, p.91). However, building core competencies is not an easy task; thus, managers should be motivated to take proactive actions to build core competencies for the long-term growth of the firm.

This relationship between empowerment by principals (owner of firms) and responsibilities of agent (the management of the firm) is the agency relationship (Donaldson and Davis, 1991, p.50). As entrepreneurs are the key players of firm, they strongly influence the practice to gain competitiveness of the firm (Man and Lau, 2000, p.237). Accordingly, corporate executives are expected to demonstrate their abilities to identify, build, and leverage core competencies of firms (Prahalad and Hamel, 1990, p.79). Empowerment was literally defined as the top-down process of delegation of decision powers within an organization (Conger and Kanungo, 1988, p.471). Chan and Lam (2011) adopted the agency perspective to explain the performance behavior of corporate management in terms of workload and motivation. They suggested that the right tasks should be assigned to staff who are accountable and such tasks should be positively aligned with the interests of those accountable staff for the tasks to be performed (p.623). Agency theory suggests that stockholders are the principles and the managers are the agents, and the interest of these two parties should be aligned otherwise the interests of owners will be sacrificed in favor of the agents (Donaldson and Davis, 1991, p.51). Agency theory suggested that principals (shareholders) are risk neutral and the agents (managers) are risk averse; in addition, it suggested that risk-neutral principals should sustain all the risks (Donaldson and Davis, 1991, p.103). Nevertheless, managers should be motivated to accomplish the goal to build core competencies.

Proper authority to top management team is the key to the success of building core competencies. Conger and Kanungo (1988) defined power as the possession of formal authority or control over organisational resources. They also proposed that empowerment means a motivational construct and a process rather than delegation authority or sharing resources (Conger and Kanungo, 1988, p.473 and p.474).

However, empowerment might have negative effect that lead to overconfidence and misjudgment on delegation of authority or resources (Conger and Kanungo, 1988, p.480). Therefore, the service quality of agents is critical to form's operation (Singh and Sirdeshmukh, 2000).

6.3.2 Science and craftsmanship of building core competencies

One of the contemporary challenges for strategists is the art-versus-science question in strategic management. 'Where strategy scientists refer to strategic planning as *deliberate* process; Mintzberg (1987) refers it as an *emergent* process (David and David, 2017, p.375). Strategy scientists view that firms need to systematically assess internal and external environment, perform business research, analyse evidence, and evaluate alternatives for decision-making, while Mintzberg views that strategy formulation is of artistic nature (David and David, 2017, pp.374, 375). Mintzberg's notion of *crafting* suggests that 'strategic decision be based on primarily holistic thinking, intuition, creativity, and imagination' (David and David, 1987, p.374). The researcher supports the view that strategic management be deemed as a science rather than a mere art and advocates that both views be considered in decision-making process. Specifically, both the scientific approach and *crafting* approach should be permeated in the decision-making process and at the stage of the execution of strategies. Empirical evidence proved that this integrated approach is applicable. For example, on the one hand, the conceptual framework of MBCC provides a systematic way of thinking; and on the other hand, the execution of strategic decisions needs managerial efforts, skills, coordination, and commitment. This integration approach involves different functions of staff at operational and management levels. MBCC is a systematic framework for examining the generation of core competencies, and it depicts the cause and effect relationships among dimensions. It was systematically

developed through the research design, based on the philosophical stance of constructivism; and it was derived from the analysis of data gathered from 11 in-depth interviews and 23 company documents from five Case Companies. Specifically, it employs traditional research approaches and methods including triangulation in data collection, data analysis (especially thematic analysis and cross-case comparison), interpretation, and logical inferences supported by relevant theories.

Scientific considerations of core competencies building

Scientific considerations of core competencies building include systematic development of MBCC in form and the justification of logical relationships in nature among dimensions of MBCC. A mechanism is a useful device to illustrate the cause and effect relationship of elements underlying a reality. ‘A mechanism is a little theoretical machine, a “mere device,” out of which large structures of theory can be constructed. It translates causes into effects’ (Stinchcombe, 2005, p.238). ‘...Mechanisms connect causes to effects’, and ‘Mechanisms turn causes into effects’ (Stinchcombe, 2005, p.149, p.176). MBCC assumes that the psychological features of the management members are stable, and their behaviors are rational and flexible over time. MBCC has a form of eight dimensions depicting relationships of such dimensions; however, it is not rigid and purely mechanical. It was supported by relevant theories, e.g., core competencies (Prahalad and Hamel, 1990), dynamic capabilities (Teece et al., 1997), organizational learning (Crossan et al., 1995), and knowledge management (Turvani, 2002); and it has extensive practical evidence. This symbolic form contains rich connotations, for example, the dimension of collective learning has five themes and 20 primary concepts. The dimension of core competence has five themes and 39 primary concepts, and the dimension of optimal resource amassment has five themes and 52 primary concepts (see pp.182-186). The

conceptual framework of MBCC serves to understand and explain the interactions of dimensions to generate core competencies.

The form is the structure, while the contents are the components and details, jointly constituting a vivid metaphor of *theoretical machine*. MBCC is partially similar to the *economic framework* of Rouse and Daellenbach's (2002, p.966), which suggests that resources are organized into routines that form capabilities and core competencies. As Teece et al. (1997) posit that 'quality performance was driven by special organizational routines' (p.519). Then such core competencies are leveraged into products and services to achieve competitive advantage and gain economic rents (Rouse and Daellenbach, 2002, p.966). MBCC and the economic framework present a logical process about how core competencies are generated and the function of core competencies in the *economic framework* of Rouse and Daellenbach's (2002).

Craftsmanship of core competencies building

Core competence building requires managerial skills and efforts, such as communication and organizational skills, involvement and commitment across the firm because it engages many levels of employees and functions (Prahalad and Hamel, 1990, p.82). Essentially, MBCC does not exclude such managerial activities; instead, it examines causes and effects about the generation of core competencies. MBCC explains what subsequences that a given action can cause. It looks into the effects of the interactions among dimensions that cause changes in the essence of core competencies (collective learning as a kind of capability) at the conceptual level, not on the managerial activity level, i.e., building corporate culture and social architecture to enhance employees' engagement and team building. In practice, these managerial activities create organizational routines (shared patterns of interaction of individual

behaviors) that demonstrate core competencies in the form of social interactions. In fact, MBCC does include such managerial activities that create supper corporate routines that demonstrate corporate core competencies. For example, in the dimension of *responsive strategies*, it addresses enhancing management, intensifying operation, transformation and innovation (see p.182). In *collective learning*, it addresses issues of experience and professional management team, and cultural influence (see p.184). In *core competencies*, MBCC addresses that core competencies are embedded in capable management building, and efficient operation and management (see p.186). Core competencies are embedded in organizational routines that generate productive services and products, as Teece et al. (1997) posit that ‘quality performance was driven by special organizational routines’ (p.519). Therefore, core competence building requires managers’ wisdom and skills.

Synthesizing approach for core competencies building

The form and contents of MBCC should be taken complementary to understand and explain the *reality*. The form is a good means to illustrate relationships among concepts and dimensions at the abstract level, while those rich contents provide solid support at the concrete level. Specifically, the concrete level provides secondary themes and primary concepts in figures and tables. The form and its connotations of MBCC should be taken as a whole.

The building of core competencies involves conceptual level and the concrete level. The conceptual level refers to the examination of changes of the essence (*collective learning*), and the concrete level refers to the managerial activities, i.e., collaboration of professional, technical and administration staff, and building of corporate culture and social context. In other words, the difference is that MBCC focuses on mentality,

while managerial activities are about behavior. The rationale goes that managerial activities for building core competencies are derived from cognition and collective learning because changes in collective learning precede managerial activities. While close collaborations and cross-management engage managerial activities to build corporate routines, MBCC focuses on the positive changes of the essence of the building core competencies because collective learning is a capability to learn and accumulate knowledge, and generate routines. It is the collective learning capability that knowledge and cognition are gained, thus driving to effect cross-management collaboration or functional process in order to create routines that demonstrate core competencies. The researcher appreciates the view that ‘an effective creation of a core competence is both an art and science processes’ because factual evidence, in terms of paths to build core competencies, can be found in data Table 12 of Appendix 4.

The form of MBCC is systematically developed, and its contents are flexible to be applied to cope with changes in internal and external environment. MBCC provides a systematic way of thinking and a solid basic for *crafting* strategies. Luran Albert states that ‘I have found that the very best solutions arise from a willingness to blend art with science, ideas with data, and instinct with analysis’ (David and David, 2017, p.375). ‘It is not wise for a strategist to rely too heavily on gut feeling and opinion instead of research data, competitive intelligence, and analysis in formulating strategies’ (David and David, 2017, p.375).

6.4 Findings for future studies

The study discovered two striking topics in relation to core competencies and RBV that deserves efforts for future studies:

- the view of ‘Typology and Phase’ (TP) of core competencies which is related to the type of core competencies deployed at different development phases of a firm.
- the view of building ‘Optimal Portfolio of Resources’ (OPR) of a firm which is related to resources.

6.4.1 The view of ‘Typology and Phase’ of core competencies

Data show that firms deployed different core competencies at different time along their business cycles. Competencies in a particular business entity were built based on the characteristics of services, strategic opportunities and internal resources; accordingly, varied services require different types of competencies in a specific situation (Gimzauskiene and Staliuniene, 2010, p.133). Mascarenhas et al. (1998) posed three types of competencies, i.e., technological know-how, processes, and relationships with external entities (p.118). They further asserted that these three types of competences are consistent with those found in previous research (Mascarenhas et al., 1998, p.118). Finding 1 of this study is the three generic core competencies pursued by Case Companies. In addition, the researcher identified two salient affirmations regarding core competencies in terms of typology and their chronicle applications along the path of a firm’s development. Interviewee 2 of Case 3 viewed that there are four types of core competencies that a firm may possess: (1) resources-based core competencies, (2) operational-based core competencies, (3) management-based core competencies, and (4) intellectual-based core competencies (Table 5). The interviewee of Case 5 viewed that different type of core competencies should be deployed at different stage of the development of the firm. However, he did not mention what specific type of core competencies should be deployed at different development stage of a firm. Nevertheless, he did stress the importance of the deployment of heavy assets such as cargo cranes on terminals at the initial stage of

their operation. Interviewee 2 of Case 3 emphasised that their core competencies were based the services delivered from their VRIN assets in core geographical locations. The other four Case Companies all had the same view that their core competencies were based on different VRIN assets and the unique locations serving different customers (see Table 12). Such data evidenced that firms possessed different core competencies at different stage of development of a firm. This suggested the need to adjust the resources portfolio of a firm in alignment with a firm's development and in response to environment changes. The typology of core competencies is depicted in Figure 10 below:

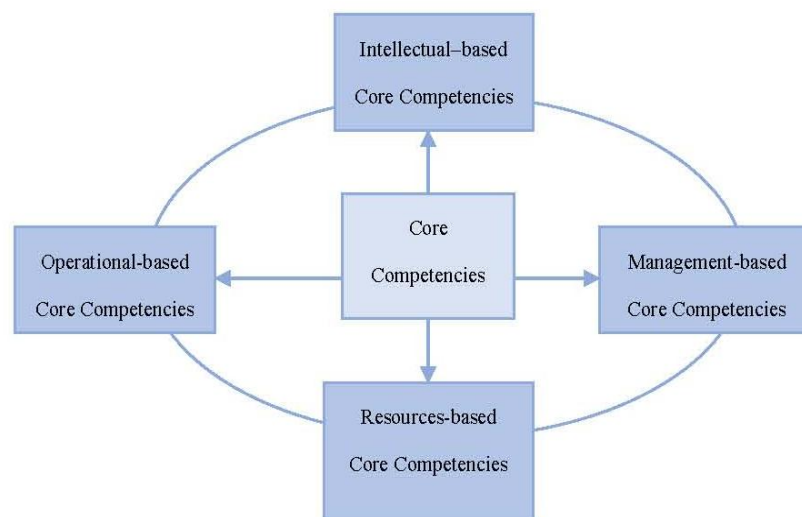


Figure 10: Typology of core competencies

Generally, all five case companies can be deemed as at their mature stages of their development cycles. Accordingly, the type of core competencies they deployed belongs to management-based core competencies; and they are moving on by taking digitalized transformation in operation. This trend suggests that the type of core competencies will be changed to intellectual-based core competencies (Figure 10).

Specifically, Case 1 emphasized that its core competencies were based on global layout of VRIN assets and global operations, and the firm is at full strength for informationalized transformation by building a logistic ecosystem. In practice, the firm is now building an integrated digitalized operating platform leading to the application of advanced technologies in operation such as 5G, internet, block chain, big data, and algorithm. In the operating platform, big data and algorithms shall be the critical issues. The firm will build intelligent ships, intelligent ports, and intelligent operation and management systems. This ambitious move aims to transform the firm from a traditional shipping firm into a leading intelligent and comprehensive worldwide logistics service provider. In addition to the possession of VRIN assets, Case 2 emphasized that its core competencies were based on efficient port operations and access to cargo bases. The firm will complete the construction of an intelligent port with automatic operations in 2021. Case 3 emphasized that its core competencies were based on the VRIN assets, the key geographical locations, and the complete industry chain and supply chain. The possession of VRIN assets guaranteed a firm's bargaining power, and it solidified their market positions. Yet, Case 5 emphasized that its core competencies were based on strong production capabilities derived from VRIN assets, which provided customers' satisfaction services in terms of service quality, operation efficiency, and cost effectiveness. Case 5 stressed that its core competencies were based on VRIN assets in terms of deep-water berths for accommodating mega-vessels. In addition, its core competencies were based on its world standardized port operations with an equity JV partner of a global key port operator (see Table 10). The fundamental commonalities of these firms are that they all possessed VRIN assets in different domains of business. At the same time, in addition to the employment of asset-based core competencies, Case Companies also applied other types of core competencies with different degree of the deployments of

operational-based, management-based, and intellectual-based core competencies at different stage of development. This finding suggested a pattern of the relation between the types of core competencies and their deployments along the development path of a firm. However, there are no indications of *specific* time horizon for the deployment of each type of core competencies that will last at each stage. Evidence can be found by the strategies that Case Companies pursued at their current development stages (see Table 12 of Appendix 4).The relationships between core competencies and development phases can be generally illustrated in Figure 11 below.

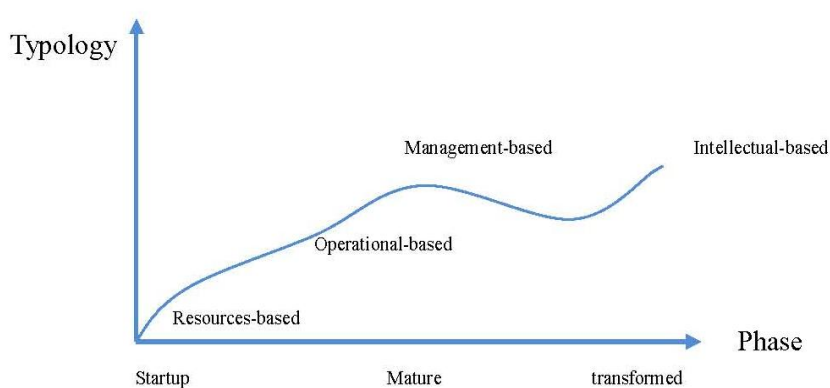


Figure 11 Typology of core competencies and development phase

Figure 11 suggests that all industry leaders may pursue intellectual-based type of cores competencies at the transformation stage of their development, as they claimed that they are undertaking transformation in terms of operation models and the implementation of digital technologies. In practice, these five firms may deploy all four types of core competencies; however, the degrees of the deployment of each type of core competencies may vary among these Case Companies. Case 1 is more advanced in building intellectual-based core competencies through building digitalized logistics ecosystem for informationalized operation. Case 2 pursued the same strategy for digital transformation, and it had established its own digital research

institute for smart port operation in 2021. Case 3 persisted on its core business, and it is currently upgrading its operating and management information systems with digital technologies. Case 4 launched upgrading programs in operation, marketing, customs clearance, and management systems. Case 5 had deployed intelligent terminal operations in new invested projects in China. The data showed that the development trend is that these leading firms are taking iterated transformation in terms of business models and the utilisation of advanced technologies. Besides, the specific core competencies of each Case Company were shown in the theme of embodiments of core competencies in Figure 8. Table 5 below shows the possible deployments of different types of core competencies by firms at different development stages.

Table 5 Typology and deployment of core competencies

Deployment phases	Startup	Mature	Transformed
Core competencies			
Resources-based	deployed	deployed	deployed
Operational-based		deployed	deployed
Management-based		deployed	deployed
Intellectual-based			deployed

The TP view of core competencies suggests that firms may deploy various types of core competencies at different development phase to meet their growth objectives and to respond to environmental challenges. This suggestion implies that firms should build their core competences to align their development phase and readjust such core competencies to fit environment changes. The TP view also suggests that port enterprises started with the resources-based type of core competences; and as they grow, they will gradually include deployment of different types of other core competencies. However, the deployments of each type of core competencies are not mutually exclusive; they are flexible and complemented each other. The only

differences are the degree of deployment at different time and situations. For example, Case 1 ranked top one in the world in terms of tangible assets such as ships, and terminals as well as its operation network and production scale. The firm still maintained resources-based, operational-based, and management-based types of core competencies. Currently, the firm is undertaking the irreversible transformation from traditional port operator into an integrated logistics service provider with digital empowerment. Although, Case 3 mainly deployed the resources-based core competencies in terms of VIRN assets, sound industry chain, and supply chain; the firm operates successfully in terms of service quality, efficiency, and profitability. Regarding the progresses of digital transformation, other Case Companies had launched different projects to upgrade or rebuild their operating assets by utilizing new technologies. The business practices of these five Case Companies show that no one of these types of core competencies is better than the other is. It is about which type of these core competencies is the best to fit the firm in a specific time and place.

6.4.2 The view of ‘Optimal Portfolio of Resources’

The aim of creating an optimal portfolio of resources of a firm is to allocate firm resources efficiently for their most productive deployments. RBV suggests that management develops strategies to cope with challenges or opportunities by exploiting resources in the best possible way. The relation between resources with VRIN attributes and competitive advantage is that VRIN resources generate comparative advantage that contributes to competitive advantage of a firm in the market. The relation between core competence and RBV is that core competencies are regarded as special type of resources. RBV suggests that unique and firms-specific core competencies should be built on firm's resources that satisfied the criteria of VRIN; therefore, the firm can leverage them to achieve SCA for rents. RBV regards

firm resources as heterogeneous and imperfectly mobile; therefore, the main managerial function of a firm is to understand and develop strategies to organize resources to gain SCA. Since resources and core competence are closely related, efforts are required from management to learn to build, nurture, and retain VRIN resources and core competencies.

Purpose of creating OPR

The purpose of building an optimal portfolio of resources (OPR) is to meet the requirements of 'strategic fit' (Venkatraman and Camillus, 1984, p.513) and 'strategic flexibility' (Winfrey et al., 1996, p.204). The reason to keep an optimal portfolio of resources is the need to provide support to the strategies deployed. Because the soft power as the core competencies will be weak without such solid support of resources especially in logistics industry. Changes in existing resources are necessary at a given time for best advantage; even cost of such changes are high (Turvani, 2002, p.197). This means that the deployment of resources needs to meet three conditions that the deployment opportunity must be existed, perceived, and motivated (Ghoshal et al., 2002, p.295). Ghoshal et al. (2002) argued that the creation of economic value, whether by individual or firms, need to engage utilisation and consumption of economic resources; and these resources must be integrated in better ways to create new products or services for value (p.284). For creation of an OPR, it needs two distinct abilities: (1) the ability to perceive potentials of the resource integration and replacement, (2) the ability actually to carry out resource integration and replacement in operation (Ghoshal et al., 2002, p.285). Ghoshal et al. (2002) pointed out that each time of new integration of firm resources means new source of 'potential' value is created (p.284).

Understanding OPR

This topic is related to heterogeneity of resources, which are the prerequisites for building core competencies (Wilkens, 2004, p.11). It specifically related to the dimension of optimal resource amassment regarding optimal resources. The optimal resource amassment dimension has eight themes of concepts and more than 30 primary related concepts made this dimension appealing and challenging. According to the data gathered, this dimension has a broad spectrum of themes including typology, criteria, purpose, configuration, and construction window (Figure 8).

These themes reflect the operational and management activities for building corporate resources from different perspectives. Based on the first finding (generic core competencies) and the second finding (MBCC) of this study, it was obvious that firms' resources played a critical role in business. Accordingly, profound studies on the topic of resources have been extensively conducted. However, there were no studies conducted on the building of an optimal portfolio of resource of a firm. During the investigation, the researcher noticed that Case Companies and interviewees mentioned acquiring operating assets, constructing new terminals, warehouses, storage yards, layout of ports or shipping routes, or consummating industry chain or supply chain. When asking whether Case Companies have definite plans to build a desired stock of assets, there were no definite answers. On the one hand, acquisitions or mergers were taken place frequently; yet, on the other hand, no firms have clearly visioned an optimized portfolio of resources they would retain. Even though firms have mid-term or long-term plans with capital budgeting practice, these plans are mainly individual projects or a group of projects. They are not necessary the OPR of the firm as a whole. In practice, Case Companies are familiar with acquisition of assets, constructing terminals, upgrading and disposal of assets, maintaining resources,

and leverage resources. However, the issue of building an OPR has never been on their agenda (Table 8 of Appendix 4). There might be three main possible explanations: the environmental uncertainties, the lack in methodology to manage this issue, and the lack in sufficient evidence to substantiate such needs.

Regarding OPR, the immediate problem is the consensus on the definition of ‘optimal portfolio’, and the data proposes varying suggestions. Interviewee of Case 5 mentioned that they would consider increasing production capacity in terms of terminal space or ship berthing spaces when the current operating capacity reached 70 percent of the limit of the production capacity. In addition, the interviewee of Case 4 mentioned that they closely studied and monitored the market demands in order to control the construction pace of ports. Therefore, the issue of building an OPR did exist in reality. Based on the evidence, the topic of building an OPR may be qualified if some criteria and assumptions are taken into consideration. These may include using accounting and capital budgeting methods, closely monitoring market situations, and utilizing big data technologies. However, the key issues are how to define ‘optimal’, and in what way to define it. Is it a qualitative judgment or a quantitative decision? Despite of these ambiguities, this topic deserves future study efforts, as one of the interviewees of Case 3 viewed that it is a high-level managerial task. The researcher views that this issue may be well attended by using informationalized technologies, as the interviewee of Case 1 mentioned that the digital transformation in operation will be benefited by big data and algorithms. It may be possible that the utilisation of technologies of big data and algorithms may redefine RBV or core competencies. Therefore, this finding raised two questions: how to define ‘optimal portfolio’ and how to build an OPR for a firm. Obviously, the question of ‘optimal portfolio’ is beyond this study because this discussion focused on the building of an

‘optimal resources’ of a firm by reporting and interpreting how Case Companies build their resources base. The study leaves the theoretical definition of ‘optimal portfolio’ for later studies.

Data from Case Companies show that they are industrial leaders with secured market positions. Their operating strengths enable firms respond quickly to the ever-changing environment. One key cause of their successes is the building of a sound base of resources, as the theme of typology in Figure 8 showed that optimal resources include VRIN assets, sound industry chain, supply chain, or even the logistics ecosystem. In narrow sense, OPR includes a complete supply chain, a complete industry chain, an established layout of port, or an efficient marketing network. However, these are not necessary the OPR. Using the term of ‘optimal’, the present discussion focused on the optimal resources by applying the narrow sense of OPR. Data show that the balanced utilisation of both tangible assets and intangible resources implies that a firm may have a tentative utilisation ratio between tangible and intangible assets. This tentative utility of such operation resources is referred to as the OPR, and it is a function of strategic decisions. This OPR may dictate the utilisation of certain tangible assets and intangible assets or type of resources from outside. When certain assets or resources run short in stock, it may drive the need to build or to acquire the desired resources. In this sense, the data validated the argument for OPR as a finding for future studies.

The Magnitude and the Niche of OPR

Existing theories justify the importance and contribution of the possession of resources to the firms’ competitiveness. Specifically, RBV deems VRIN resources are the sources of SCA. According to Barney (1991), firm resources can be categorized

into tangible capital resources (Williamson, 1975), human capital resources (Becker, 1964), and organisational capital resources (Tomer, 1987). However, not all firm resources are considered strategic because some resources may become obsolete due to strategic changes or technological advancement (Barney 1991, p.102). Wernerfelt (1984) posed that strategic resources mean those resources that can conceive of and implement strategies. Accordingly, OPR means the well-balanced composition of strategic resources including tangible resource capital, human resource capital, and organisational resources capital. The merit of an optimal portfolio is to build and maintain a well-balanced portfolio of strategic resources that firm can utilise for formulating competitive strategies for strategic objectives. For identifying strategic resources as the sources of SCA, Barney (1991) suggested those four conditions, i.e., the VRIN attributes; therefore, firm resources included in the optimal portfolio should be strategic resources that satisfied VRIN conditions. Karim and Mitchell (2000) pointed out that retaining different resources enables firms to manipulate with greater degrees of coordination and integration; therefore, such organizations may develop greater core competencies and dynamic capabilities (p.1068). Barney (1991) justified that those strategies that can exploit opportunities or neutralize threats can contribute to a firm's success based on the traditional SWOT models. Further, a firm's resources can only be qualified as sources of competitive advantage when these resources satisfy the VRIN conditions which help exploit opportunities or neutralize threats (Barney, 1991, p.106). Based on the data, the researcher developed the tentative 'Optimal Portfolio of Resources' (OPR) framework as shown in Figure 12 below:

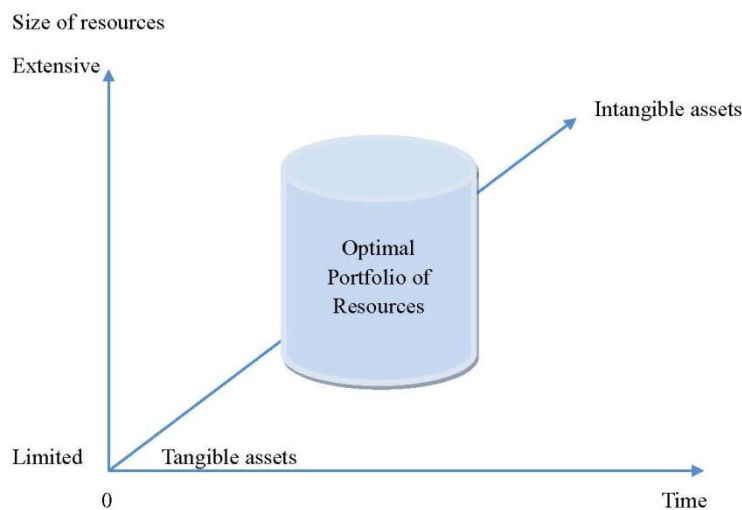


Figure 12 Optimal portfolio of resources

To maintain an OPR, a firm needs to do two things: (1) to improve the content factors, i.e., upgrading and enhancing the service functions of resources through informationalization of operations, (2) to adjust the form factors, i.e., maintaining appropriate quantity of resources to support the strategies deployed. For example, 70 percent capacity criteria and exclusive clauses in contracts (in case of Case 5) are VRIN attributes of assets used by Case Companies. The OPR is two folds in the quality and the composition of resources. Changes in resources may occur in quality improvement such as the upgrading and improvement of functions of assets, while the composition refers to the quantity and types of such assets. For example, Case 3 made the decision to launch new routes for passenger services; then, it needs more comfortable and lower fuel consumption ships. This strategy required changes in both quality and quantity of assets; therefore, it affects the portfolio of resources.

A firm can build strategic, specialized assets and resources through integration of different appropriate assets and resources (Winfrey et al, 1996. p. 199). Specifically,

in order to achieve SCA, firms can obtain heterogeneous and immobile assets with VRIN attributes through identifying, selecting, and implementing such strategic resources (Winfrey et al., 1996, p.203). In order to respond quickly to the changes of the environment; firms need to be capable to adjusting their unspecialized resources into strategic, specialized sets of assets (Winfrey et al., 1996, p.206). According to RBV, the result of a firm's performance is a function of its resources (Rumelt, 1984; Barney, 1991, and Peteraf, 1993; Amit and Schoemaker, 1993).

In the logistics industry, tangible assets are the guaranty for operation, and they are the materialistic conditions of production. Without such resources, cargo handling and transportation activities would not be possible. However, intangible resources are also important; without such resources, production is still impossible. Therefore, logistics enterprises need to build up their stocks of resources with a balance of tangible assets and intangible resources. Case Companies are similar in terms of tangible assets and intangible resources, but the actual composition of tangible assets and intangible resources are not identical. Therefore, they have different preferences of core competencies and strategies. These similarities and differences are because of their different missions and the strategies they pursue.

Generally, the OPR can be niched at any place amid three dimensions, i.e., the time, the continuum of resources, and the size of resources as illustrated in Figure 12. The position of the resource portfolio differs because of VRIN and different locations of resources in particular. Data analysis suggest that current resources of Case Companies satisfied the criteria of VRIN, evidenced by their tangible asset ratio, debt ratio, profit margin ratio and ROE. Accordingly, an OPR has three attributes: (1) it satisfies the criteria of VRIN, (2) the tangible asset ratio exceeds 50 percent of the

total asset of a firm, (3) it generates positive returns in line with or above the benchmarks of the industry. For evaluation, the financial techniques of DCF and capital budgeting can be applied in individual project or organisational performance as a whole. The successes of Case Companies can be attributed to four factors: (1) responsiveness to critical events, (2) support from Governments, (3) their corporate core competencies, (4) optimal resources base.

An OPR is a theoretical perfect-matched-combination of resources of a firm that provides synergistic effects in operation at a time, and OPR should be VRIN and flexible. Theoretically, the purpose to build an OPR is to seek portfolio effect that provides the synergistic services for production. However, the optimal portfolio is not the simple combination of all resources because OPR is about the effect of the perfect match of all resources; and the portfolio effects should be effective and efficient for production. The criteria of VRIN and flexibility implied that actual elements of resources either tangible or intangible should be upgradable, expandable, or disposable. OPR provides a framework that practitioners can use to identify the appropriate resources that satisfy the needs of production, and building an OPR is the third path in MBCC that managerial decisions can cause changes in core competencies.

Methods to build optimal portfolio of resources

One of the challenges is how to keep ‘a balance between the exploitation of existing resources and the development of new ones’ (Wernerfelt, 1984, p.172). ‘The benefits of competencies, like the benefits of the money supply, depend on the velocity of their circulation as well as on the size of the stock the company holds’ (Prahalad and Hamel, 1990, p.87). Therefore, the reconfiguration of resources is needed to respond

changes in a hypercompetitive environment (Winfrey et al., 1996, p.207). In addition, a firm should pursue a competitive strategy to achieve strategic fit by aligning their firms' resource strategies and the environment (Winfrey et al., 1996, p.207). A firm should achieve strategic flexibility by deploying flexible and reconfiguration of unspecialized assets to cope with the changes from the environment (Winfrey et al., 1996, p.207). The portfolio of firm resources will change if strategic decisions require additional or new type of resources, and the characteristics of such new resources will influence the cognition and collective learning.

Finally, the OPR views that a balanced structure of tangible and intangible asset base should be built and maintained. It implies that an effective and efficient production services should be supported by a well-balanced composition of tangible and intangible assets of a firm. The purpose to keep an OPR is to provide support to the strategies deployed, and the soft power of core competencies will be weak without the solid support of resources especially in the case of the logistics industry. Sirmon, Hitt and Ireland (2007) proposed initially the concept of 'Structuring the Resources Portfolio' with a resource management framework to build a resource portfolio at a given time (Sirmon et al., 2007, p.278). This framework suggests that managerial skills are important in structuring, bundling, and leveraging firms' resources to achieve SCA (Badrinarayanan et al, 2019, p.26). OPR deserves efforts for future studies and for that it is justified.

Chapter 7 Conclusions

The study aims to explore how Chinese MNPEs build their core competencies and what mechanisms they used to build such core competencies. It identified what core competencies Chinese MNPEs possess, and it investigated the paths Chinese MNPEs pursued to build core competencies and resources bases. The study was conducted at the right time when the five Chinese leading MNPEs were in business transformation by the application of digital technologies in operation and management. The study has achieved its aim, and it provides practitioners and researchers with insights and thoughts to understand the causes of successes of Case Companies. The significances of the study include theoretical contributions and managerial applications. The theoretical contributions to knowledge are (1) identifying *generic core competencies* in terms of new context, subject, and geographical location; (2) presenting a *new conceptual framework* (MBCC) to explain how Chinese MNPEs build their core competencies; and (3) suggesting a *solid anchor point* to link resources with core competencies and SCA. The salient managerial implications are that the present findings provide practitioners with *a tool* (MBCC) to examine core competencies, the paths to build core competencies, and the ways to build optimal resources bases. The present findings help understand how Chinese MNPEs build their core competencies to gain market positions in the turbulent environment. The present findings *set benchmarks* in terms of operation and management for industry followers in China. This study also discovered two striking topics for future studies: the view of TP and the view of OPR. In addition, the study identified two main industry developments: integration of ports in China and the intelligent transformation of Chinese logistics industry. This study focuses on a particular aspect of business activities of Chinese MNPEs, but it links to the macro-economic developments at home and abroad.

Specifically, the study contributes to knowledge of core competencies and RBV with the following theoretical implications:

- The study identified three generic core competencies of Chinese MNPEs, which includes (1) innovation in business models and operation, (2) utilisation of technologies, and (3) acquisition of strategic resources. These *generic core competencies* were discovered for the first time in the studies of core competencies in terms of operation context, subject, and geographical location.
- The study provides a new conceptual framework (*MBCC*) to explain how Chinese MNPEs build their core competencies at the conceptual level. It contributes to the knowledge in terms of a precedent schematic framework with eight dimensions for building core competencies in the context of Chinese MNPEs. MBCC is derived from systematic data analysis and supported by relevant theories including IO approach, strategy management, knowledge management, dynamic capabilities, collective learning, and RBV. The study advanced the knowledge with a new conceptual framework to study core competencies.
- The study proposes a ‘*solid anchor point*’ by virtue of MBCC to link resources, core competencies, and SCA because it stressed on key fundamentals of capabilities, processes, resources, the originating mechanism, and the trigger mechanism of building core competencies. This ‘*anchor*’ set weight in originating mechanism of core competencies for the attempt to solve the problem of causal ambiguity between resources and SCA in RBV in particular.

The study provides practitioners with the following managerial applications:

- The study sets the benchmarks by presenting three generic core competencies for Chinese logistics industry players so that peer industry players can learn and follow.

- The study provides practitioners with a managerial tool (MBCC) so that they can use it to examine corporate core competencies and choose which path(s) to build core competencies.
- MBCC suggests practical methods (in terms of themes and concepts) that executives can use to build optimal resources base.

The study recommends the following four topics for future studies:

- The topic of ‘Typology and Phase’ of core competencies as this issue concerns the relationship between the typology of core competencies and the deployment of such at different development phases of a business cycle.
- The topic of ‘Optimal Portfolio of Resources’ which posits that an OPR is a prerequisite to build core competencies of a firm.
- The topic of digital transformation of the Chinese logistics industry as this radical change may redefine the concept of core competencies.
- The topic of the impact of integration of port resources which is a major development trend in Chinese logistics industry, and such impact may significantly change the landscape of competition of the industry in future.

7.1 Theoretical implications

This study set an antecedent to the inquiry on core competencies of Chinese MNPEs. The finding of MBCC is a novel schematic model that can be used to explain how Chinese MNPEs build their core competencies. It is presented as a logical explanation to the generation of core competencies of Case Companies because it captures the critical factor to build core competencies. MBCC was developed from data and supported with relevant concepts and theories, and it is presented for the first time in the studies of core competencies. MBCC contributes to the knowledge of core

competencies and RBV in terms of the context of Chinese MNPEs. Resting on a plane of four stages, MBCC contributes to the theoretical knowledge in building core competencies by adding four dimensions to the definition of Prahalad and Hamel (1990), i.e., *critical events*, *responsive strategies*, *knowledge*, and *path-dependency*. MBCC filled the gap that no explicit symbolized framework of building core competencies claimed before MBCC in the context of Chinese MNPEs' global operations.

MBCC can be deemed as a '*solid anchor point*' to theoretical explanation to building core competencies because it focuses on the originating mechanism of core competencies. It tackles key fundamentals, e.g., capabilities, processes, and resources by connecting relevant factors in the process including conditions, capabilities, process, and resources. MBCC and its narratives depict the underlying principles of the mechanism by explaining the dynamics of each dimension and the conditions that activate the MBCC. The rationale of MBCC is about two facets: (1) it presents the conceptual framework showing the key dimensions architecture, and (2) it elaborates the essence of the mechanism and the interrelations of its dimensions with narratives, which are supported by representing data (Figure 9 and Table 12 of Appendix 4). The underlying assumption of MBCC is that changes in collective learning are because of the new knowledge gained by the interaction of processes, critical events, and resources through internalization of such knowledge gained in the learning process over time. MBCC provides a holistic, intuitive framework for acquiring and building core competencies, and such core competencies building means the positive changes in collective learning, process, or resources base that led to the changes in core competencies. MBCC provides ex-ante benefits for charting paths to build core competencies, and it can serve as a post facto tool to validate the past successes of

business activities. Thus, MBCC provides guidelines to practitioners by helping them to chart paths to build core competencies and ultimately to achieve SCA.

MBCC contributes to the knowledge of building core competencies because it was developed from the data gathered from the investigation. In addition, it is also a theoretical synthesis because it contributes to the knowledge of building core competencies by drawing on relevant concepts and theories. MBCC suggests a new framework to existing models in that it provides a schema with eight dimensions. Although Prahalad and Hamel's (1990) definitions were regarded as the originating model of MBCC; the dimensions of their model are too narrow which includes only one property (collective learning) and its four dimensions, i.e., coordination, integration, organization, and delivery (Figure 1). As Mascarenhas et al. (1998) pointed out that previous studies mainly stressed on the conditions and identification of core competencies; and little is known about how core competencies arise and how to develop them (p.117). MBCC as a conceptual framework is a more complete version of core competencies building which appears as the precedent attempt in the study of the context of Chinese port industry

7.2 Managerial applications

The managerial applications of the present findings are concrete in examples for improving operation and management, building core competencies, and building optimal resources base of a firm. First, the finding of the generic core competencies set the benchmarks for industry followers, and it suggests paths to build core competencies. Second, the merits of these three findings are that they can be applied individually or jointly, especially in the context of making strategic decisions on core competencies. Individually, each finding functions for specific purpose; and jointly,

these findings are very useful for strategic decision-making with a prospective view or a retrospective view or in management practice. Lastly, the benefits of the holistic view of findings have three folds. It guides to plan or diagnosing core competencies of a firm at the stage of planning core competencies. It depicts three ways to build core competencies at the stage of building such core competencies. It suggests ways to build optimal combinations of tangible and intangible resources in the process of building resources base. The holistic approach of applying these three findings is the valuable way to apply these findings in practice. Especially, MBCC provides practical guidelines to consider and choose the alternatives to build core competencies and methods to build resource base of a firm.

Setting generic core competencies as the benchmarks

The three generic core competencies of Case Companies set learning standards for Chinese port operating followers. Concrete themes and data are available in the *data structure* and the representative supporting *data tables* (Figure 8 and Table 12 of Appendix 4). Generic core competencies of Case Companies suggest that Chinese MNPEs possess core competencies in innovation of business models and operation, utilisation of technologies, and acquisition of strategic resource. Thus, generic core competencies suggested two main things. First, logistics service providers should take initiatives in innovative transformation in terms of business models and operation, such as building logistics ecosystem or participating in such systems because it is an irreversible development trend in the industry. Second, LSPs should apply advanced technologies such as the internet and digital technologies in their operation for quality, efficiency and cost-effective objectives. These core competencies formed the sources of SCA of these Case Companies, and they enable Case Companies to adjust their strategies to cope with quick changes in the marketplace by doing their best in

innovation in terms of business models and the systems. These three core competencies support Case Companies to perceive and cognize benefits of the application of new technologies, e.g., 5G, big data, internet, block chain, and algorithms to the new business models and operations. In addition, these core competencies assured Case Companies to have sufficient knowledge and experiences in making appropriate capital investments decisions to acquire the appropriate strategic resources such as the appropriate economic and geographical locations of ports at home and abroad.

MBCC as a managerial tool to examine core competencies

This study presents the MBCC as a managerial tool for business practitioners to examine what had been done and what should be done regarding building core competencies by indicating the relationships among different dimensions within MBCC. Business executives can examine their practice with what Case Companies have done or are doing at the present. Specifically, regarding the dimensions of *responsive strategies*, and *sustainable processes*, examples would include vertical or horizontal interaction, coordination with business partners, equity JV, and contractual JV. In addition, examples include extended operation to the upper end and lower end of the industry chain and supply chain, outsourcing, consummating industry chain, global operation and expansion. Recently, with the technological advancement of 5G, big data, and algorithms, these Case Companies are building logistics ecosystems and engaging automatic port operations, which are the radical changes in logistics industry in China. Accordingly, business executives or peer operators can examine any changes in the dimensions of *collective learning* (in terms of talents and management changes), process (in terms of utilisation of resources), and resources (in terms of

acquisition of new assets or technologies) in order to understand their core competencies.

MBCC as a guide to build core competencies and resources base

MBCC provides guidelines with three paths to build core competencies and methods to build resources base of a firm. The rationale of MBCC for generating core competencies suggests three ways to build core competencies: (1) to enhance collective learning, (2) to select the proper processes, (3) to acquire appropriate combination of tangible and intangible resources of the firm. Examples of strategies of building core competencies can be found in the *data structure* and representative supporting *data tables* (Figure 8 and Table 12 of Appendix 4). These three paths provide a new perspective to look at the building of core competencies in terms of capability, process, and resources within RBV. Case Companies are now transforming from traditional operation to digital operation and management including automatic terminal operations and logistics ecosystem as the new business models. This strategy will affect the building of core competencies through three channels, namely *collective learning*, *sustainable processes*, and *optimal resource amassment* as suggested by MBCC. Thus, interested parties can learn and follow. Where Figure 1 looks at the building of core competencies from the top, MBCC looks at the building process from the bottom of the mechanism in a horizontal way and from the part of *conditions* on the left of MBCC. These rearrangements made it possible to accommodate different conditions, and to develop the building mechanism to reflect the *reality*. Specifically, through selecting strategies or measures, practitioners can enhance collective learning, deploy desired methods, or configure resources to effect changes in core competencies. MBCC also provides three concrete methods to build

an optimal resources base, i.e., configuration, transformation, and building logistics ecosystems.

7.3 Limitations

Since the present findings were derived from the study on Case Companies, there are limitations. First, these findings were derived from the data gathered from five Case Companies; therefore, bias of interviewees may exist. Second, these findings are relevant mainly in the context of Chinese global port enterprises; and they may not be generalizable to cross industries. Although the results of data analysis provide material support for MBCC, the researcher acknowledged other limitations. These limitations are mainly because of the differences of the type of firms, the scale of operation, the asset size, and the geographical locations of key port assets. For example, the findings may not be applicable to private port operators because they may not be easy to obtain franchise for rare coastal resources to construct and operate ports in China. In addition, in terms of the size of assets or scale of operation, private firms may not be strong enough to compete with SOEs. Further, these findings do not apply to foreign firms because the management philosophy and cultures are different; however, they are applicable to JV port enterprises if SOEs control JV firms by majority of equities. Finally, the findings of the study are not parameterized but indicative guidelines.

7.4 Recommendations for further studies

The study discovered two main topics for future studies: (1) the view of ‘Typology and Phase’ of core competencies (TP), (2) the view of building an ‘Optimal Portfolio of Resources’ of a firm (OPR). In addition, two main development trends in Chinese logistics industry can be taken as topics for future studies including (1) the influences

of the digital transformation of the logistics industry, (2) the impacts of the integration of port resources. These findings were arrived at from the data collected from Case Companies, and the representative supporting data were presented in Figures 8 and Table 12 of Appendix 4. First, the TP view is valuable, yet some issues are not clear for practical applications, e.g., the definitions of the terms of the four types of core competencies are not available. In addition, the effects of each type of core competencies on different phase of development cycle are yet to be explored, and additional empirical data are needed in future studies. Second, the OPR view has the similar issues need to be investigated, e.g., the definition of the term of ‘Optimal’ has not been attempted, and further empirical data are needed for futures studies. Third, the digital transformation in logistics industry in China is an irreversible development trend but the impacts of such changes need to be studied because it will radically change the operation models and management ideology. Fourth, the impact of the integration of ports in China is unknown but the changes of the landscape of competition will occur because the competition will be among few giant port operators. The studies on TP view and OPR view will enrich the knowledge of core competencies and RBV in terms of typology of core competencies and resources building. It is expected that futures studies on port integration and digital transformation might redefine the concept of core competencies because such changes will create novel business models in Chinese logistics industry. However, these four topics are preliminary in nature.

Epilogue

The topic of core competencies has been extensively studied because of the importance of such claimed as the sources to achieve SCA of firms since Prahalad and Hamel (1990) posed the concept. The main streams of theories in the quest of the

sources of SCA include the concept of core competencies (Prahalad and Hamel, 1990), and theories of RBV (Penrose, 1959, Wernerfelt, 1984; Barney, 1991), dynamic capabilities (Teece et al., 1997), and SCA (Barney, 1991). Other theories include Organizational Learning (Crossan et al., 1995; Wilkens et al., 2004), and Knowledge-Base View (Grant, 1996). However, among these theories, the topic of core competencies is an eternal theme in strategy management, and the studies should advance with the times, especially in the era of rapid development in informational technologies. Within these theoretical boundaries, the substantial gap was identified in the area of mechanism of building core competencies both in the existing literature and in practice in the context of Chinese MNPEs. The task to fill the gap was accomplished by the present findings, i.e., the identification of generic core competencies of Case Companies, the conceptual framework of the MBCC, and the suggested paths to build core competencies. Obviously, the empowerment of the present findings are not mutually exclusive but complementary. These findings generate synergy when they are applied in the process of making strategic decisions on building core competencies. As Nordhaug and Gronhaug (1994) affirmed that since core competencies can be used to depict firms' capabilities to outperform competitors, it is essential for companies to analyse and identify their core competencies. Accordingly, actions can be taken to build and manage such core competencies (Nordhaug and Gronhaug, 1994, p.95). Core competencies are the special capabilities enable a firm to outperform competitors in marketplace, and they are the sources to gain SCA. MBCC suggests that the building of core competencies is triggered by critical events, effected by responsive strategies, based on knowledge, moderated by path-dependency, and through the interaction of *collective learning*, *sustainable processes*, and *optimal resources amassment*. Core competencies are incarnated in different products, services or functions across a firm; and they are the

special capabilities in effective and efficient utilisation of resources to achieve SCA.

After all, the building of core competencies is about wisdom and resources support.

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Appendices

Appendix 1 In-depth interview protocol

Data Collection Protocol (concise version)

Introduction

The purpose of the protocol is to provide guidelines for collecting appropriate primary and secondary data for the study. The criteria of appropriate data include legality, relevancy, and authenticity.

I. Research design

The research adopted the multiple-case study design. It followed the procedures of conducting inductive case study (Eisenhardt, 1989, p. 533) and the 5-Rs research guidelines (Yu, 2018). The main contents of the research design include the following:

Name of the study

- Core competencies building of Chinese multinational port enterprises (MNPEs)

Research problem and questions

- Description of the cases
- Main research question: How do Chinese MNPEs build their core competencies?
- Specific questions:
 - (1) What are the core competencies that Chinese MNPEs possess?
 - (2) What are the mechanisms that Chinese MNPEs used to build their core competencies?
 - (3) What are the paths that Chinese MNPEs adopted to build their core competencies and resources bases?

Theories and research devices

- Relevant theories: RBV (Penrose, 1959; Wernerfelt, 1984; Barney, 1991), Dynamic capabilities (Teece et al., 1997), Core competence concept (Prahalad and Hamel, 1990), and Industrial organization economics (Andrews, 1971; Porter, 1980)
- Decomposing framework

Research approach and methods

- Nature of the study
- Philosophical assumption: Constructivism paradigm
- Inductive research
- Research methods:

Text analysis, content analysis, thematic analysis, and cross-case comparison

Research devices

- Data structure (dimensions, themes and concepts)
- Table shell
- Data table

Selection of case companies

- Selection of case companies
- Five Chinese leading port operators with global operations and three industry associations in China

Data sources

- In-depth interview, about 60 minutes each section, at least eight interviews
- Annual reports for the period of 2015-2019, for Case Companies
- Target data: 11 in-depth interviews and 23 annual reports
- Venue of collection: Interviewees' offices, websites of Case Companies

Investigator

- Single investigator

Instruments for data collection

- Data collection protocol
- In-depth interviews questionnaire for primary data collection
- Table shell for secondary data collection

Timeline

- Completed in July, 2020

Outcome of the study

- Conceptualised model of building core competencies and possible serendipitous findings

II. In-depth interview questions

(Appendix 2 In-depth interview questionnaire)

III. Data collection procedures

The data collection for in-depth interviews consists of seven steps as below:

1. The interviewer shall announce to interviewees his identity as a candidate for DBA of the UWTSD, and he shall explain in detail the purpose of the interview and issues of confidentiality (anonymity of interviewees and Case Companies, and scope of the use of the data).

2. The interviewer shall use a semi-structured questionnaire with questions developed from the literature review, especially from Figure 1 construct decomposition framework of the definitions of core competencies. These questions are derived mainly from eight aspects: (1) operation and management, (2) strategic management, (3) key factors affecting the operation and management, (4) development strategies, (5) resources, (6) human capital, (7) capital budgeting, and (8) entrepreneurship. Sample questions are presented in Appendix 2, In-depth interview questionnaire.

3. The interviewer shall take detailed notes (or taking recordings, subject to interviewees' approval) for all in-depth interviews. The interviewer shall also take

follow-up questions and clarifications for emerged issues, codes, categories or themes, if it is necessary.

4. The interviewer shall review and edit interview notes to ensure accuracy of the data.

5. The interviewer shall document impressions, key factors, patterns, themes, trends based on interview outcomes for further analysis.

6. The interviewer shall review and compare interview outcomes of Case Companies to identify further interview questions until saturation. Triangulated checking shall be used to ensure accuracy and quality of the data and information.

7. The interviewer shall translate the Chinese transcripts of in-depth interviews into English, and preserve such data properly in computer with hard copies.

IV. Evaluation

The evaluation criteria of data include legality, relevancy, and authenticity. Where legality means that the providers are appropriate in terms of titles and authorities to provide the data or information. In addition, the data should be obtained from lawful resources. Relevancy means that data should be logically relevant to the research questions, and authenticity means that data should be real in forms

Appendix 2 In-depth interview questionnaire

University of Wales Trinity Saint David

Doctor of Business Administration

Doctorial Research Project on Corporate Core Competencies Building by Chinese Multinational Port Enterprises

In-depth Interview Questionnaire

No.

Interviewer:

Contact:

Student No.:

Date:

Time:

Venue:

Duration:

Interviewee

Subject/Company:

Interviewee: Mr./Miss/Mrs./Dr.

Position

Years of service:

Function:

Contacts:

Tel:

Email:

Questions and Answers (Q & A) (Sample)

Section 1 Background

Q01. Would you please tell me what your role and responsibilities are with this company. (individual's capacity)

Q02. Would you please tell me about your background before you joined this company. (individual's working experiences)

Q03. What are the business modules of your company? (business spectrum)

Section 2 Strengths and capabilities

Q04. Since this study focused on core competencies; may I ask how you define or your company defines core competencies. (core competencies)

Q05. What are the core competencies your company possesses? (core competencies)

Q06. What can you do the best in each of the business modules? (core competencies)

Q07. How were these core competencies reflected on reality? (core competencies)

Q08. How can you achieve that strength you do best in each module? (capabilities)

Section 3 Relations between tangible assets and building core competencies

Q09. What are the core assets that are necessary for good operational performances? (core competencies and resources)

Q10. What are the relationships among company tangible assets, capabilities, and core competencies? (relations between core competencies and tangible assets)

Q11. What do you think about coordinating resources for operation and management? (capabilities and mechanism)

Q12. What do you think about integrating resources for operation and management? (capabilities and mechanism)

Q13. What do you think about expanding tangible assets base? (e.g., expanding berth capacity or warehouse spaces) (relations between tangible assets and core competencies)

Q14. Would you please explain why your company builds tangible assets. (relationship between assets and core competencies)

Section 4 Important events

Q15. Would you please tell me what are the key stages of the development of this company. (key factors)

Q16. Under what situations, did your company acquire additional assets? (Key factors)

Q17. Under what situations, did your company dispose assets? (key factors)

Section 5 Strategic decisions

Q18. What are the characteristics of the top management team? How do they influence investment decision-making? Can you give me some examples? (strategic decisions and capabilities)

Q19. What are the main experiences and lessons that your company gained in formulating strategies? (learning and capabilities)

Section 6 Development strategies

Q20. What types of the investments does your company usually undertake? Does your company increase the existing assets or acquire different types of assets for new business? (development strategy)

Q21. When making major capital expenditure decisions, what considerations did your company take? (development strategy)

Section 7 Capability building

Q22. What are the processes that did your company use to build core competencies? (process)

Q23. What are the elements of these mechanisms? (process)

Q24. How did these processes function? (process)

Q25. What insights, lessons or challenges have you learned from the process of building core competencies? (learning)

Q26. Does the staffing of technical personnel match the services of those existing major assets? How did you manage to do so? (learning)

Q27. What are the means that did your company use to acquire assets? (process)

Q28. Did you outsource for technical supports? (process)

Q29. What are the means that your company used to select quality assets? (process)

Q30. Are there any slack assets in your company? (resources)

Q31. What accounting methods did you use as the criteria for capital investments? Can you give me some examples? (process)

Section 8 Resources

Q32. What are the major operating assets does your company posses? (resources)

Q33. What are the means that your company used to dispose assets? (process and resources)

Q34. Under what situation, did your company conduct your own research and acquire additional assets? What are they? How did you do that? (key factors affecting resources)

Q35. What are the purposes of acquiring, disposing, and developing your own assets? (key factors resources)

Q36. How did you assess the effectiveness and the efficiency of these acquired, disposed or independently developed assets? (process and resources)

Q37. What are the financial sources for capital expenditure? (financial strengths)

Interview Transcript

Answers to the questions:

Confirmation of interviewee:

Date:

Statement of Consent

Date:

To interviewer and persons who may concern

Dear Sir or Madam,

Re: **Doctoral research project - Consent for interview**

Having been informed of the purposes of the subject interview and the conditions of the use of the contents, I agree to entertain the interview as arranged.

Signature of interviewee:

Appendix 3 Business profiles of Case Companies

Business profile of Case 1

Case 1 is the biggest integrated logistics enterprise, and it was reorganized from two key SOEs in 2016. It principally engages in the business of operating and managing cargo terminals and related business at home and abroad. The company is a listed company in Hong Kong Stock Exchange and a strategic business unit (SBU) for port operation of its parent company, which is an SOE of the central Government of China. The parent company is the largest integrated maritime transportation enterprise in the world. The company operates 288 berths at 37 ports worldwide such as in South East Asia, Europe, the Mediterranean, and the Black Sea, of which 197 were container-handling berths. The vision of the company is to become a global terminal operator as ‘the Ports for All’, and the mission is to offer a synergistic platform connecting global shipping routes offering mutual benefits to all partners in the shipping industry. It engages port operations with its owned or controlled ports in China, and 18 ports in various countries along the ‘Belt and Road’, which was an initiative launched by Chinese Government in 2013. The total terminal throughput of containers handled by the company was about 60 million TEU, ranked top one in the world in 2018. The company adopted the marketing strategy to build a well-balanced global terminal network by constructing a well-established supply chain system, and it optimize strategic ties with its business partners world-wide. The Case Company is one of the largest port operators in the world.

Business profile of Case 2

Case 2 is a global leading port developer, investor, and operator, and it was reorganized from two key Chinese port operators in 2018. The vision of the company is to become a world-class integrated port service provider, and its mission is to

operate and manage port assets for consolidating and synergistic development at home and abroad. The company adheres to core port business and engages in international port investment, development, and operation. The company aims to expand along the value chain and establish an integrated port network services system that connects the world. The company also aims at the development opportunities emerged from China's 'Belt and Road' initiatives. The business module of the company is the integrated port networks services system to embraces the global business. The company operates in Hong Kong ports and overseas ports in Sri Lanka, Togo, and Turkey. In addition, the company has overseas expansion projects in Brazil, Australia, and Djibouti. Moreover, the company engages extensively in port operations in the northern part of China. To improve port operation efficiency and management, the company launched the Electronic Data Interchange (EDI) system, which is a big data and visualization platform. Such EDI has enabled the port operation to cover fully the functions of shipping companies, ship agents, Customs brokers' and truck operators.

The development strategy of the company is to uphold its long-term strategy and tap its competitive edges through technology innovation. To realize its vision, the company undertook specific measures to strengthen its operational synergy. It accelerates integrated organic development by making efforts to enhance various capabilities, improve risks prevention and control, as well as to establish quality development models. One of the core competencies of the company was the application of innovated integration of technologies to port operations. For technology innovation, the company has been actively pushing forward projects, including RTG (remote control), digitalized port construction, and big data analysis systems.

The operating strategy to cope with environmental challenges is to adhere to the operation philosophy of ‘enhancing core capability, insisting on both quality and efficiency, capitalizing on opportunities of the era, and striving to become a global leading enterprise’. Specifically, the company focused on four operational areas, i.e., the port development, ports consolidation, overseas expansion, and ‘five key priorities’. Such key priorities include (1) home-based port development, (2) ports consolidation, (3) overseas expansion, (4) integration of industry and finance, and (5) business innovation. Early in 2018, the trade dispute between the United States and China occurred, and the global economy became uncertain. To cope with this challenge, the company adhered to the operation philosophy and made improvements in operation. In 2019, the company continued the strategy and focused on three tasks. First, the firm leveraged the synergistic advantages of the firm to create a leading regional port and international shipping centre in South Asia. Second, the firm consolidated and coordinated domestic ports for capitalizing on the opportunities arising from the ‘Belt and Road’ initiative. Third, the firm coordinated the development of firm’s logistics services in the Yangtze River Economic Belt, and the Guangdong-Hong Kong-Macau ‘Greater Bay Area’. The company is one of the large port operators in the world.

Business profile of Case 3

Case 3 is a well-established logistics enterprise in Guangdong; it was founded in early 1960s in Hong Kong. The company is the main strategic business unit of a key SOE of the Guangdong provincial government. Its shares were listed on Hong Kong Stock Exchange in 1997 with 70% held by the parent company and 30% shares held by individual investors and private institutions. The principal activities of the company are investment holding and operation of river cargo terminals and passenger ports in

Hong Kong, the Greater Bay Area, Pearl River delta in China, as well as in overseas countries in South East Asia. The company operates a fleet of high-speed passenger ferries. The vision of the company is to become a key waterway public transportation service provider and the key port operator providing investment management and cargo handling services. Its mission is to utilise its strategic assets, integrate its logistics business, and advance its information systems. The business of the company consists of five modules, namely (1) the cross-border passenger transportation, (2) local transportation in Hong Kong, (3) terminal logistics, (4) overseas investment, and (5) capital operation. The company focused on new opportunities in local international airport logistics business, land transportation, and E-commerce. The company is one of the leading waterway passenger transportation operators in the world.

For more than 40 years, the company has been enjoying favorable brand recognition in the industry, playing a key role in river trade connecting Hong Kong, the Pearl River delta area, China, and the world. Specifically, its core businesses include container transportation, port operation, warehouse logistics services, and the high-speed passenger transportation services. The company owns and operates 21 river cargo terminals, 15 passenger ports in Hong Kong, and the Pearl River delta area, in China. It operates a fleet consisting of more than 20 high-speed passenger vessels providing ten routes of ferry services connecting the Hong Kong International Airport and other river passenger ports in the area. The fleet is the largest one in terms of types of ship in the world. The main operating assets of the company include cargo terminals, trucks, port facilities, cargo ships, passenger ships, warehouses, and container depots. The company built up four operating networks, namely the marketing network, the transportation network, port network, and the information

network. In complementation with the operating networks, the company organized its operation into four modules, namely (1) the cargo transportation and shipping agency, (2) cargo handling, warehouse storage and cargo consolidation, (3) passenger transportation and agency services, and (4) investment holding. The first operation module provides mainly the container cargo carriage and shipping management. The second module refers to cargo handling including the loading and unloading of containers, and cargo consolidation at terminals. The third module involved in passenger ferry services between Hong Kong and various passenger ports in Guangdong, China. The last module refers to the equity investments in joint venture business. The operational and the managerial activities are supported by a set of strategic assets and resources.

In 2018, the trade dispute between the United States and China occurred. To cope with this critical event, the company employed the strategy to seek ‘Radical Change and Development’. Accordingly, the company adopted concrete actions. Such actions include (1) upgrading a warehouse in the ‘Greater Bay Area’ to accommodate refrigerated meat storage business, and coordinating other terminals to handle air cargo through the marketing network platform called ‘consolidated logistics platform’, (2) changing to conduct the break bulk cargo business, (3) soliciting industrial park clients, (4) providing cargo yard services; and (5) making efforts to innovation in business integration, for example, to innovate in water-land-rail union transportation mode. In passenger ferry services, the company adopted the strategy called ‘All-in-One Ticket’ cooperation with airlines and land transportation. In local tour business, the company invested in new ferries, tourist terminals, and facilities to operate the local harbor tour business.

Business profile of Case 4

Cases 4 is a leading port operator owned by the local municipal government of Guangzhou, and it was reorganized in 2016. The vision of the company is to become an international navigation hub port as the ‘World-Class Port, Servicing the World’, and its mission is to improve and upgrade port operation and management and explore new business for growth. The core business of the company is to provide cargo handling and logistics services, and the company was ranked among the top five in terms of cargo throughput in China. The company possesses rare tangible assets, i.e., the port situated at the estuary of the Pearl River, which is the international trade gateway to southern China. The port was well-known as the departing port of the ancient marine ‘silk road’, and its favorable geographic location enable the company to provide extensive access to a vast cargo base covering the southern and southwest parts of China. The company enjoys a sound transportation infrastructure connecting maritime and rail transportation diffusing to the Southeast Asia. The port is a navigation hub functioning for the Guangdong-Hong Kong-Macau, and ‘Greater Bay Area’ in China.

The development strategy of the company is to consolidate and optimize the port resources by building the intermodal transportation platform and the logistics information platform. The company focused on the opportunities arising from China's overseas development initiatives and the Free Trade Zone construction in Guangzhou area. To achieve these objectives, the company adopted specific measures including: (1) building a logistic network providing cargo transportation service using shuttle-services and sea-rail services, (2) expanding terminal berthing spaces, (3) building EDI information centers and utilizing EDI to streamline customs clearances, cargo inspection, and survey processes, and (4) carrying out E-green and smart port

construction projects. However, in 2018, the trade dispute between the United States and China occurred, and this critical event severely affected the global industrial chain and the Chinese economy. To cope with this challenge, the company adopted the transformation strategy to build ‘smart port’ operation with digital technology to alleviate productivity, and the building-up E-green port. The company is the most advanced enterprise in utilisation of data information technologies to build ‘smart port’ in China.

Business profile of Case 5

Case 5 is a leading port operator and an SOE owned by the municipal government of Shenzhen. The company was established in 1997, and its shares were listed on Shenzhen Stock Exchange, China. The company engaged principally in port development and operation. Its core businesses include cargo loading and unloading, transportation, management of terminal construction, express toll road operation and management, export bonded custody warehouses, and port integrated logistics services. The vision of the company is to become an ‘integrated service provider of port investment and operation with brand influence’, and its mission is to provide integrated services including handling of bulk, partial cargo, and containerized cargo, and multimode transportation services. The development strategy of the company is to focus on core business, financial integration, internal integration and external exploration for development. Its business modules includes (1) investing and operating ports as the core business, and (2) the port services supply chain and near port industry development.

Guided by the development strategy, ‘One city-One Port-One Operator’, the company build up its core competencies in three operating functions, i.e., port operation, toll

road operation, and warehouse logistics. In terminal operation, the company maintains efficient operation and management and sustains its established corporate brand. Such core competencies are supported by its tangible assets owned or controlled by the company. To enhance its competitiveness, the company diversified its operation to toll operation, which generates steady cash inflows and improved local land access to the port. The company owns bonded warehouse, customs warehouses, general warehouses, special warehouses, and consolidation centers. The company operates the largest single port in the world, playing a key role in local economic development and the global trade.

Appendix 4 Tables of representative supporting data of Cases

Table 6 Combined representative data: Case 1

Representative supporting data for each second order theme	
2nd order themes	Representative 1st order data
Critical events	
Environmental challenges	
‘Changes in the global environment, politics, and economics matter [it is like] life or death to businesses.’	
‘The world economy is deeply integrated, and the landscape of politics and the economy of the world are undergoing historical changes.’	
‘Our firm’s businesses were influenced by the changes of global trade, the reforms of international and domestic supply side.’	
‘Affected by the global macro-economic changes, the Chinese domestic shipping market also encountered low ebb and a continuing correction period. Accordingly, mergers and acquisitions, large-scale and intensive operations became the main development trend in the industry.’	
‘As an SOE, any policy changes of SASAC will affect our operations.’	
‘International industry competition became more intensified because more major market players are participating in international bidding for cargo carriage contracts.’	
‘Old fashioned logistics contexts are about the extension of operations upstream or downstream, now the logistics context needs to be rebuilt according to the needs of customers. We need to build a new fashion of [an operations] ecosystem for allocating different sources.’	
‘The logistics industry in China is now in the process of operational transformation; it is called iterated transformation. It is a hot topic, and it is the development trend of the industry.’	
‘In fact, digitalised transformation is used to remould our traditional business models for elevating operating efficiency and maximise operating results. The strategy is to build a new shipping context and the new logistics ecosystem.’	
‘The emergence of 5G technology has changed the traditional competition style, and it is an irreversible change which is beyond our imagination.’	
‘We are now conducting a digitalised transformation program in operation.’	
‘We are now engaging in two things, a digitalised platform by application of	

digitalised technologies and gathering data.’

‘I feel that the competition is not traditional competition in terms of quantity or price; it is about the application of technology, especially 5G. The emergence of this technology will change the traditional competition style, and the technology will be subversive to our imagination.’

Reorganisation

‘The company was reorganized from two key SOEs in 2016.’

‘The cause of the merger of the company was due to the current severe international competition in logistics industry and the need for business transform for production effectiveness and efficiency from traditional operation into informationalized operation and management.’

‘The merger of two giant SOEs of the central Government caused reorganization of corporate management structure, changes in business strategies, business reorganization, and integration of resources.’

Responsive strategies

Enhancing management

‘One way to cope with a challenging operational environment is to change management team members.’

‘Reshuffling members of the management team is an effective way to improve management. Although our group has huge assets, yet the operating profit is not satisfactory. Accordingly, reshuffling of management was taken place, and our operation performance is now improving because of the change in operation and management.’

‘Top management team was reshuffled. Accordingly, new management strategies were developed; especially, the top management changed the focus of management from the old style of production management to emphasize on capital assets management at the top level with greater degree freedom to SBUs.’

Customer satisfaction

‘The important thing is to understand the needs of customers and satisfy their needs in our development plan.’

‘As a shipping service enterprise, the goal we pursue is to realise our customers’ values in terms of advanced, quality, and efficient full supply chain services by our integrated industry train.’

‘We adopted the operating ideology of “market orientation and customers as the centric businesses.”’ ‘We uphold the principle to consummate customers’ service systems, to maintain closer communication with clients, and to satisfy their needs.’

Transformation and innovation

‘Digitalised transformation means the utilisation of advanced digital technologies to change the traditional business models.’

‘The whole context of the logistics industry should be rebuilt, and it should not be the traditional way for operational extension to upstream and downstream of the industry chain. The industry needs to build an entire new fashion of an ecosystem as a tool to allocate different logistics resources to satisfy customers’ needs.’

‘We are transforming from a traditional competition player, in terms of shipping routes, into a world class integrated supply chain service provider.’

‘Our company will integrate resources including ship-fleet, network, products, marketing, and talents to facilitate organic growth, allocation of resources, market exploration, and consummate global layout of resources and operation.’

‘We aim to provide full coverage of customers’ services by getting operation through upstream and downstream of the supply chain, and to consummate our industry chain by building ‘6+1’ industry clusters. The industry chain includes (1) shipping industry, (2) shipping finance, (3) logistics industry, (4) equipment management, (5) shipping service, and (6) social industry and internet related business.’

Knowledge

Experience

‘We have an experienced and professional operating and management team which provides customers with stable and secured services.’

‘We have a strong cargo carriage capacity, and we were ranked top one in the world in terms of bulk cargo transportation.’

‘Our development strategy from end-to-end on the supply chain was based on the changes of the mainstream of cargo sources. Our development strategies depend on changes within the market.’

Cognition

‘Core competence is about the knowledge of the industry, national strategy, and external conditions.’

‘Cognition on specific issues helps you to better develop strategy.’

‘Regarding shipping, we need to understand the values of customers before we can satisfy them by delivering those values they pursue, which are safety, reliability, and credit of performance.’

Path-dependency

Vision & Mission

‘Our vision is to become a world leading comprehensive logistics service provider,’ and ‘Our mission is to offer a synergistic platform connecting global shipping routes and offering mutual benefits to all partners in the shipping industry.’

Development strategy

‘Our development direction and mode are customer oriented. We should configure our shipping assets and resources to satisfy our customers’ needs and their values.’

‘Our development strategy is to consummate a layout of industry clusters including shipping, shipping finance, logistics, equipment manufacturing, shipping services, socialised industry, and ‘Internet +’ related business, through integration of shipping factors.’

Government directives

‘We followed the Government’s directives to undertake digital transformation of our port industry.’

‘The firm capitalised on the opportunities arising from the State’s global strategy of ‘Belt and Road’ initiative.’

Collective learning

Management capability

‘Top management members with professional knowledge and expertise about the industry are important to lead our company because the logistics industry is a capital intensive and knowledge intensive industry, and it involves huge operating assets.’

‘I felt and recognised that rich experiences and a strong technology based background of staff helped to build core competencies.’

Industry position of firm

‘Our port operating business has been developing rapidly, and it will be soon ranked No.3 in terms of container throughput in the world.’

E-commerce thinking

‘We have just established an internet company, and we visited some E-commerce

companies in China. We learned how to integrate all business information including four flows: business information flows, commerce flows, commodity flows, and flow of funds. E-commerce has been developing fast, and we need the mindset of E-commerce, and integrate such thinking.'

'Thinking is critical; without thinking, expertise is useless. Capability means technical experiences and learning.'

Enhancing learning

'We learnt from benchmark firms and launched training programs for staff to enhance their knowledge and expertise. I like to practice; but without theories, we shall be disoriented.'

'Our company promotes cultivation of talents through innovation for corporate development vigour.'

'We have the policy to recruit global talents and local employees in overseas projects, and we learn from benchmarking foreign firms.'

Training

'We recruit talents for our domestic and overseas operations, and we set up benchmarks for training.'

'Staff training programs are mainly for job related skills.'

'I prefer innovation, research, and the development of new things. Now I am working on developing a new type of navigation chart. Capabilities mean technical expertise and learning.'

Culture influence

'I conducted an experiment once on board a ship, where our Chinese crew followed the western rules and styles, the task failed; but when our people followed Chinese rules and styles, we succeeded. This is the evidence of culture differences.'

Sustainable processes

Integration

'We established an equity joint venture shipping firm with cargo owners to maintain our close business relationships, and satisfy customers' needs. We have more than a dozen of this kind of firms.'

'We promoted cooperation with other international ship-owners in terms of equity joint ventures or long term carriage contracts.'

‘Possessing technologies does not automatically mean competitiveness because it needs effective integration of other resources of the firm.’

‘Integration now means from end C business to rely on industry chain operation at home and abroad.’

‘Large scale reorganisation is not the ultimate goal, but it means deepening optimal relocation of resources. It aims to leverage synergy to achieve value creation.’

Coordination

‘We adhere to the operating ideology of market orientation by focusing on customers, consummating service systems, and communicating closely with customers to satisfy their needs.’

‘Once we become more competitive, we may control more ships rather than owning more ships; this objective can be achieved by our strong competitiveness in coordination.’

‘Coordination is the most effective way to leverage synergy and overall development.’

Cooperation

‘No a single firm can dominate the whole market because the market is too large. The market needs harmonised cooperation between market players.’

‘We cooperate with peer operators to connect different sections of carriage for transportation of ores.’

‘We promote and deepen cooperation with ports and shipping firms to build the logistics ecosystem for shipping and port industries.’

‘We shall strengthen our global business relationships with interest related partners, especially, those partners in developing countries; and we shall share knowledge, expertise, and technologies with them, and provide financial support to them.’

‘Peer cooperation helps achieve mutual benefits in terms of optimal relocation of resources and converging industry intensity.’

Innovation

‘Digitalised transformation means the utilisation of advanced digital technologies to change the traditional business models. We are building our shipping industry into a new ecosystem to elevate our operating efficiency and maximise our operating results.’

‘Our company is now developing an ecosystem with a digitalised platform to attract

best shipping firms and port operators.’

‘Because of the customers’ demands, the changes of production modes, and the internet technology, we need to face such challenges by upgrading the traditional shipping services, and enhancing the capability to create comprehensive measures to meet market demands. We need to continue innovation in new business models and the cross industry business for enhancing competitiveness.’

‘Our digital transformation involves in intelligent shipping, intelligent port operation, and intelligent business models.’

Optimal resources amassment

Purpose

‘Our operating assets must be able to satisfy customers’ values before we can think about how to allocate our resources.’

‘Acquiring advanced and bigger ships means low operating cost and high loading capacity; therefore, it means more competitive.’

‘New ships mean production efficiency and stronger competitiveness.’

‘The purpose of acquiring operating assets or building new ships is to enhance our core competencies.’

Criteria

‘We should configure our shipping assets and resources to satisfy our customers’ needs and their values.’

‘The selection criteria of resources are the production efficiency of such resources. For example, new ships mean a competitive edge in competition.’

Typology

‘Our firm is now building a mega-digitalised platform which can access all detailed information of our operating and management activities.’

‘In terms of tangible resources, the main types of operating assets include terminals, ships, shipyards, industry chains, and supply chains.’

‘Our industry chain includes seven industry clusters, i.e. shipping, shipping finance, logistics, equipment manufacturing, shipping services, socialized industry, and ‘Internet +’ related business; through which different shipping factors were harmoniously integrated.’

‘We have built a global layout of ports and shipping routes with 51 ports in the world.

This 'Route-Port' layout serves as our industry chain.'

Configuration

'We are in the process of transformation by integrating firm resources both at home and abroad to expand our operations from end-to-end of the supply chain.'

'Supported by our Government, we established equity joint ventures with ore mine proprietors, port operators overseas; therefore, we maintained a competitive advantage over others.'

'Building intelligent ports and acquiring new ships mean a stronger competitive advantage.'

'As far as our company is concerned, the ways to build assets and resources are (1) to consummate a full industry chain and (2) to build advanced ships at our own shipyards. These are the physical conditions to support our core competencies.'

'Our strategy to build our resources base is to expand our industry chain to consummate our business structure and the layout of resources.'

'We focus on building a global operating network in new emerging market countries for enhancing our operation capability in global ports, shipping routes, and services. We increased overseas investments in ports, warehouse, storage yards, and distribution centres to build a sound and comprehensive global logistics network.'

'We have acquired a major port in Europe which was the first major overseas acquisition after the reorganisation of our company. This project is a new milestone in our overseas investment and operation.'

'We have built an integrated industry chain with related factors servicing global customers.'

Core competencies

Embodiment

'We have a professional management advantage in terms of fleet management, crew, operation, skills, and shipping safety management.'

'A digitalised business platform is a reflection of core competencies.'

'A full industry chain is a way to reflect firm's core competencies.'

'Transformation of business models and iteration of cargo ships are the incarnate expression of core competencies.'

'Our core competencies were reflected in our full industry chain and supply chain, whereby we can provide integrated logistics services to customers from cargo sources,

transportation, and delivery.’

‘Our core competencies were also reflected on the application of intelligent operation, such as intelligent port operations, and green shipping practices.’

‘Our core competencies were reflected on the capability to renew ships.’

‘We have the financial and operational capability to acquire foreign port assets.’

Building path

‘We are now building a digitalised business platform called logistic ecosystem, wherein more than 170 firms will participate. Within the platform, all data are traceable, and reports of movement of cargoes are available. This platform is digitalised with a large quantity of data that is processed by algorithms for optimal business solutions. This is the main path that we used to build our core competencies.’

‘Keep learning is a way to enhance core competencies.’

‘To cope with current competition, we are now launching the program to build our competencies through digitalised transformation in operation and management.’

‘Our process to build core competencies is to build a digitalised business platform.’

‘Our process to build core competencies is to build a full industry chain and supply chain.’

‘Expansion by M&A is a way to gain competencies.’

‘The approach to build core competencies is to integrate firm’s global logistics chain and exploit synergy of such resources.’

(Source: annual reports and transcripts of Case 1)

Table 7 Combined representative data: Case 2

Representative supporting data for each second order theme	
2nd Order Themes	Representative 1st Order Data
Critical event	
Environmental change	
<p>‘The growth momentum of the global economy remained weak in 2019, and the US-China trade friction and geopolitical tension affected the global economy and trade.’ ‘The company is confronted with the complex and changing external environment.’</p> <p>‘The improvement of navigation channels accommodated calls of mega-vessels to the ports operated by the company.’</p> <p>‘The main triggers of our strategy change are the changes of Government policies, the market conditions in terms local ports competition, and the overseas development strategies among SOEs in China.’</p> <p>‘The environment opportunities are the potential business arising from the Government’s policies of “Belt and Road” initiative and the development plan of the “Greater Bay Area”.’</p>	
Restructuring	
‘The company was merged from two Chinese port operators in 2018.’	
Responsive strategy	
Global marketing	
‘Our immediate customers are international shipping companies, and we followed advanced global port operators for international marketing because it is our critical operating activity.’	
Exploring market	
‘The core task of operators is to take the proactive attitude to explore the market.’	
Innovation	
<p>‘The company deployed the digitalisation strategy, and continued to build ‘e-Port’ in a large scope.’</p> <p>‘The innovation projects involve operating models, including capital management, integration in business operation, internet technologies, e-commerce, and a refined management information platform.’</p>	

Development strategy

‘The firm elevated its operation capabilities and its global market influence by building up its global port network, and the firm seized investment opportunities to develop overseas projects.’

‘Our development strategies will focus on the opportunities arising from the “Belt and Road” initiative.’

‘The firm seeks to study closely the changes of macro-economy and industry development opportunities for growth.’

Management control

‘Different equity structures determine different management control. We are an SOE run by domestic staff. We learned from our examples of international major port operators, and we are active in operation and management innovation. We take the differentiated development strategy with a global perspective.’

Knowledge

Knowledge management

‘Our company attached importance to the building of a team of talents. The key issue is to build our management team with a focus on management ideology and their capability of acute judgement of market situations; otherwise, we may miss development opportunities, or be disoriented.’

‘The firm established a knowledge management system with an aim to facilitate the accumulation and transmission of the knowledge of the firm and individuals.’

Professional judgment

‘One of the issues about intelligent port operation is how to apply it in our ports. It needs professional judgment.’

Path-dependency

Vision & mission

‘The company’s vision is to become a world-class comprehensive port service provider.’

‘The mission is to achieve a ‘world-class’ enterprise on various areas, including global container throughput, market share, performance results, operational management capabilities, utilisation of assets, labour productivity, and brand name.’

Development strategy

‘Our capital investments are based on our ‘Five-Year Plan’ or ‘Ten-Year Plan’, but not

on ad hoc decisions.’

‘We followed our established development models for domestic and overseas projects; our overseas investment projects are in alignment with Government policies, and based on the opportunities arising from such policies.’

Collective learning

Benchmark learning

‘My view is that learning means coordination and integration, and that we should follow our benchmark for efficient utilisation of resources.’

Learning

‘The group provided internal training to staff to enhance their job related skills.’

Sustainable process

Development pace

‘Our investment decisions are related to our core business, and such decisions are based on our acute judgment on market conditions.’

Transformation

‘We are now moving for intelligent transformation by utilising high-end technologies in our operations that help provide stable services to our customers, and we are constructing intelligent ports.’

‘The firm facilitated the home-base port development projects by upgrading its port zone to capitalise on the opportunities arose from the local Free Trade Zone development.’

‘The firm is now transforming one of its general cargo terminals into an automatic, intelligent, green, and low carbon container terminal.’

‘The issue of intelligent port operation has been raised for many years; it is an inevitable development trend in port industry.’

Coordination

‘The company collaborated with domestic and international ports by integrating management of home-based ports and other ports zone for promoting barge network and building a feeder-port-layout.’

‘The company optimised the Customs clearance process with the program of ‘Unification of Customs Zones’ in its home-based ports, hence, consolidating its market leading position.’

Integration

‘The firm integrated internet technologies to enhance the synergy derived from the collaboration between ports and logistics zones.’

‘The firm acquired new assets and integrated existing assets for container operation.’

Peer cooperation

‘The firm established a strategic cooperation with a major international shipping line to explore jointly the development opportunities overseas.’

Optimal resources amassment

Market orientation

‘We are doing very well in marketing, and our efforts are market oriented.’

‘Our development depends on our market share, business momentum, and the resources available.’

‘Our port development pace depends on our assessment of the market conditions, and our entry point to incremental terminal expansion is market oriented.’

Building platform

‘The firm is launching a project to build a smart port ecosystem to improve operating efficiency of assets, and to promote business innovation of home-base ports.’

Configuration

‘The company focused on hub port construction, investment in bonded logistics operation, port-related manufacturing operation, and layout of ports to attract foreign investments.’

‘The firm is conducting transformation plans to upgrade traditional terminals into modern container terminals with automatic, intelligent, and green operating environment.’ ‘The firm will also build a smart port ecosystem for home-base port operations.’

Core competencies

Embodiments

‘Our competencies and successes lie in our marketing activities, and our management team is doing very well in marketing.’

‘Our advantage of geographic location is rare and not replicable; therefore, we can leverage such an advantage to access vast cargo bases.’

‘We used the coastal line to build the port with the permission from the Government.’

The coastal line is the rare nature resource, and the port is the basis for our core competencies.'

'One of our key resources is our capability to access the vast cargo bases that support our business.'

'The firm achieved synergy by exploiting our existing port network for enhancing value creation for customers.'

'Our core competencies mean that we are capable to consummate our port portfolio worldwide.'

Building path

'The firm conducted assessments and studies on the macro-economy and the industry, and formulated implementation plans to convert internal capabilities and resources into competitive edges.'

'One path to build core competencies is to build a comprehensive port ecosystem for synergy.'

'Our overseas port investment projects constitute an important part of our port network.'

(Source: annual reports and transcripts of Case 2)

Table 8 Combined representative data: Case 3

Representative supporting data for each second order theme	
2nd Order themes	Representative 1st order data
Critical event	
External environment	
	<p>‘Our cargo handling business at terminals was severely affected by the US-China trade friction and the changes of the Government’s environmental protection policy.’</p> <p>‘Currently, we are encountering negative impacts to our passenger ferry business due to the improvement of land transportation and the opening of the Hong Kong-Zhuhai-Macau bridge. Our other businesses have also been affected by the US-China trade friction, which are the market’s negative impacts on our businesses.’</p> <p>‘I have the view that the market fundamentals and environment factors changed swiftly and dramatically due to changes of Government policies, relations among countries, and the infrastructure in China.’</p> <p>‘Our businesses were affected by the environmental changes, e.g., US-China trade friction, geopolitical tensions, the opening of Guangzhou-Shenzhen-Hong Kong express rail link, the opening of the Hong Kong-Zhuhai-Macau Bridge, and the opening of Nansha Bridge. The challenges of trade friction and geopolitics impacted the cargo shipping industry; the improvements of infrastructure of road transportation affected our passenger ferry business.’</p> <p>‘We encountered US-China trade friction and the Covid-19 pandemic, which affected our business severely.’</p> <p>‘The group drives forward the ‘second venture’ strategy, and exploits business and investment opportunities in the development of the Guangdong-Hong Kong-Macau in “Greater Bay Area”, so as to transform and upgrade its core business for sustainable growth.’</p> <p>‘We seized the development opportunities arising from the strategy of “the airport economy” and the “bridge economy”, and we expanded storage and cold chain facilities. One of our ports in Zhuhai was designated by the local Government for imported refrigerated cargos.’ In addition, in response to the national strategies of the “Greater Bay Area” development and the “Belt and Road” initiative, the company seized these development opportunities to build its two platforms: cross-border passenger investment and capital operation. The purposes of building these platforms are to accelerate business transformation and to promote innovation and</p>

development.’

Structure change

‘We became a listed company in 1997, and this structure change enabled us to secure our industry position in terms of bargaining power and financial strengths.’

Non-system risks

‘Our main operating weakness is the higher costs in terminals as compared with that of the benchmarking terminals in the same region because our terminals are located far away from the cargo sources. Accordingly, we strengthened our cooperation with customers on overall supply chain to increase customer loyalty.’

‘One of our wholly-owned cargo terminals was expropriated by the local Government because the permission to operate it as a cargo terminal was revoked by the Government in 2017.’

Responsible strategies

Transformation

‘One driver of our strategic change was the changes in global trade environment, and the other driver was the changes in domestic demands; accordingly, we adopted the business transformation strategy by engaging both foreign trade and domestic trade.’

‘In 2017, we changed to provide full logistics services by integrating our marketing network, warehousing network, and the terminal network.’

‘We entered the airfreight business with the Hong Kong International Airport because we have the logistics base in Tuen Mun which is very near the airport across Hong Kong harbour. This base is equipped with warehouse facilities, X-ray inspection equipment, cargo handling plants, and transportation means.’

‘We built a warehouse equipped with refrigerated storage and transportation facilities in Nansha, Guangzhou, to provide E-commerce business.’

‘We established an operation alliance (called South-China Express Line) with one of the leading port operator in Shenzhen to provide cargo feeder services among ports in Pearl River Delta and the port in Shenzhen for international line shipping services.’

‘For different clients in terms of type of cargo and cargo base area, we developed tailor-made services plans to suit their logistics requirements by providing connected services of land transportation and railway transportation.’

‘Our business strategies are subject to impairment of tangible assets, e.g., the breakdown of container handling cranes.’

Market opportunity

‘Our decisions on investment projects depend on the opportunities arising from

market changes, and subject to core resources available at the time.’

‘To capitalize on market opportunities, we adjusted our operation strategy to enter the new business of airfreight logistics services for Hong Kong International Airport.’

Destructors

‘I have the view that the characteristics of the top management members are the substantial influential factor in our strategic decision making because their different backgrounds and working experiences will affect our decision-making.’

‘Limitations on decision-making include high turnover of top management members, and the empowerment by the higher level authorities.’

Causes of action

‘Changes of market conditions caused changes of our strategic decisions. For example, we hedged the negative impacts to our cross-border passenger ferry services by entering the local ferry business.’

‘Our business strategies are also affected by the shifts of business centres and the business risks; for example, now the local operation centre is shifting from Tuen Mun in the eastern part to the western part of Hong Kong with container terminals and airfreight operations in that area.’

Marketing

‘We employed flexible marketing strategies by providing customers with tailor-made logistics plans to reduce clients’ transportation costs to attract new clients especially in the “Greater Bay Area”.’

‘For passenger ferry services, we adopted flexible sailing schedules by increase sailings in public holidays and peak hours.’

Growth drives

‘Our business growth was driven by five factors: the “Greater Bay Area” airports, the Hong Kong-Zhuhai-Macau Bridge, the development of Nansha, the cross-border e-commerce, and the overseas investment.’

Business expansion

‘We are now transforming part of our business to engage airfreight logistics services by deploying our terminal and warehouse facilities which dominate the prime geographical locations near the airport.’

Competition

‘One of our competition strategies is to integrate port resources into strategic business units by centralising management to compete with rivals.’

‘To rely on informationalized operation is one of our imperative strategies in

competition, not just rely on existing operation assets.’

Decision empowerment

‘As far as an SOE is concerned, our investment decision powers are limited. Whenever an investment exceeds a limit in terms of funds commitment to that investment project; it shall be submitted to several higher levels’ authorities for approvals. By doing so, we may lose our market opportunities because of the delays in upper level decision-making processes. Our decision empowerment is generally not sufficient to respond to swift market changes.’

‘In investment decision-making process, we follow SASAC’s directives regarding limits of fund commitments, core business related projects, and ROA required.’

Knowledge

Management trait

‘Decision makers with different backgrounds or professions affect investment decisions because decisions were made based on their past experiences and lessons.’

Experience

‘The knowledge and experiences of the management term will determine their preferences in investment strategies.’

Path-dependency

Vision & mission

‘The vision of the company is to become one of the leading waterway passenger transportation operators in the world and one of the leading navigation logistics operators in ‘Guangdong-Hong Kong-Macau Greater Bay Area.’

Investment criteria

‘Our investment projects should satisfy the SASAC’s two investment criteria: core business related, and the rate of return required. Recently, we acquired a local ferry business, and the project satisfied the requirements of SASAC.’

Development strategy

‘As an SOE, our investment and development are subject to supervisory regulations, and the general guidance is our mission statement.’

Basis of decision

‘I think the important thing for our decision-making is the strategic commitment of our decision makers to investment projects. We need strategic persistence because markets need cultivation.’

Collective learning
On the job training
‘The terminal logistics business may be subject to machine failure and goods damage as certain machines and equipment may become obsolete. We have continuously undertaken four tasks: (1) to strengthen inspection and maintenance on equipment and machinery, (2) to improve employee’s safety measures and prevention awareness and operating skills, (3) to enhance regular staff training and on-the-job training, and (4) to ensure operation in accordance with regulations.’
Adjustment services
‘We tried to understand the needs of our customers, adjust services and prices on a timely basis, compare the advantages and weaknesses over competitors, enhance service quality and customer satisfaction, and compete in services rather than in price.’
Learning from peers
‘Through establishing the equity JV with a peer passenger ferry operator (Hong Kong-Macau ferry service) by expatriating our shipping management services, we learned operating models and management ideologies from our counterpart; therefore, we enhancing our management systems and management capabilities.’
Sustainable process
Peer partnership
‘We established a peer partnership with a key port operator in Shenzhen and set up a strategic alliance for providing shuttle cargo services to the key terminal for exportation. This partnership operation can leverage our operation platforms, and it became one of our revenue sources.’
‘We established partnership with Customs clearance agencies to facilitate Customs declaration process, and we set up equity JVs with partners for terminal operations’.
Coordination
‘As a general local shipping agent for many river shipping firms, we have a strong capability to coordinate with ship owners and with local Government organisations in representing the interests of ship-owners.’
‘We adhered to the ideology that we are playing a team game, not an individual game; therefore, internal and external coordination are all important.’
‘In response to the market condition and demand, the company took measures to coordinate various resources. Such measures included optimising ferry routes by

increasing sails, assisting ship owners to invest in new ships, offering various fare packages, and launching advertisement and promotions.’

Integration

‘To meet the requirements of the business development, we upgraded our equipment and facilities; for example, we upgraded the X ray machines for airfreight logistics services in our warehouses.’

‘We were not doing well in integration of our resources before, where each business module operated and developed on its own. Now we have integrated our logistics resources into a logistics chain, and all functions can be linked together to improve operating efficiencies and performance results.’

Cooperation

‘We exerted efforts to explore domestic cargo resources from various major manufacturers of electric home appliances for our port operation, and we also enhanced cooperation with major shipping liners and freight forwarding companies.’

‘We cooperate with a key port operator in Shenzhen to provide the ‘South China Express Line’ containers services in the Pearl River Delta area in Guangdong, China.’

Optimising

‘To develop new business at our terminals and to diversify the cargo portfolio, we took measures to optimise operation processes by accelerating the replacement of vessels and assisting in the building designated ports and wharves. With our professional and featured capabilities, we jointly developed ‘port-to-port’ express settlement services with peer ports.’

‘We believe that being environmentally and socially responsible could enhance our performance and contribute to the overall sustainable development of the society.’

Difficulties

‘So far as an SOE is concerned, the external integration of resources is not easy because each firm’s mission is fixed, and such mission is not easy to be changed. However, internal integration is more efficient.’

Optimal resources amassment

Configuration

‘Our methods to configure our resource base include exchanging equity shares, acquisition of assets, and disposal of obsolete assets.’

‘Asset configuration is strategy oriented, and utilisation of assets should support

strategies.’

‘Our operational principle is to configure supportive resources to our strategies, and our investment projects must be strategic resources.’

‘We upgraded our X-ray equipment to conduct inspections of airfreight cargo in Hong Kong.’

‘We completed a transformation project of a temporary site by utilising smart terminal equipment in conjunction with the container yard location system, which improved the efficiency of container delivery and settlement.’

‘The company has built two port networks; one is for cargo port operations and the other is for passenger ferry operation.’

‘The activities of our asset base configuration include building internal assets and admitting assets allocated by the Government (i.e., assets from other SOEs). Specifically, the activities included upgrading existing assets, building smart port operations, renewing ships, building operation platforms, improving property’s equipment, maintaining equipment, and enhancing functions of assets. In addition, such activities include consummating logistics networks (i.e., industry chain, supply chain, and layout of ports), revitalizing assets, and swapping quality assets.’

‘Our configuration of resources includes overseas business expansions. We have expanded our logistics networks in Vietnam, the Philippines, Thailand, and Singapore; our overseas logistics chain was also consummated.’

Typology

‘Our assets are VRIN assets such as the geographic locations of our cargo ports and passenger ferry ports, and the franchises of cross-border passenger ferry operation.’

‘Our operating assets include ships, terminals, logistics warehouses, and auxiliary plant and machineries.’

‘Our operating resources include passenger services, port logistics, auxiliary business, expressways, industry chain, and supply chain.’

‘The analysis of a desirable portfolio of tangible and intangible assets of a firm should not be a quantitative issue; rather, it should be the qualitative judgment. However, if we use quantitative approach to this issue; we should compare our results with the industry average benchmarks.’

‘Our resources include terminals, warehouse, fleet, and operating and information systems which are for passenger services, logistics, terminal operation, and warehouses operation.’

‘We have retained a labour force of capable, technical, operational, and management

professionals, including ship engineers, captains, and terminal construction engineers. These professionals are all valuable resources of our firm. Accordingly, we have established sound human resources management systems.’

‘For human resources management, we pursue the principles of equality, voluntariness, and consensus. We abide by a people-oriented principle in affairs, such as the provision of employment opportunities, remuneration, training, performance assessment, promotion, and other employee benefits.’

Criteria

‘We configure our asset base subject to three conditions: (1) acquiring operating assets for new investment or new business, especially, those terminals with unique geographic locations, (2) replacing obsolescent assets, and (3) upgrading assets for industry safety or for environmental protection purpose.’

‘Owning only one individual terminal does not cause linked effect in operation, we need to possess VRIN assets and a pool of port resources to create linked effects in our operation.’

‘The criteria for acquiring assets are that it should be related to core business, and that it should satisfy the performance requirements of the SASAC in terms of ROI and ROE.’

Core competencies

Embodiments

‘Our competitive advantages are derived from our full layout of tangible assets.’

‘Our core competencies mean unique and sustainable operating capabilities in various areas including utilisation of assets, talents, skills, management capabilities, and the layout of assets.’

‘Our core competencies mean our knowledge to identify and acquire the core and proper investment projects; for example, we acquired a unique piece of land which is valuable for undertaking airfreight business. This asset is adjoining the Hong Kong Airport across the Hong Kong harbour, and it connects our river terminals located in key areas with access to cargo bases in the PRD.’

‘Our corporate brand is one of our core competencies in marketing.’

‘Our unique competitive advantages were reflected in our best resources that include a capable management team equipped with overseas and domestic operating and management experiences. Specifically, the team is also equipped with skills in shipping, logistics, brand operation, and capabilities in assets reconfiguration.’

‘Our core competencies were reflected on our marketing network, operation network, amassment of customers, cooperation with ocean shipping lines, and the layout of port network.’

‘Our core competencies were reflected in efficient communication with Government organisations in terms of representing the interests of our customers.’

‘Core competencies mean a kind of capability that competitors or peers could never reach. It means possessing VRIN assets, and accumulation of management capabilities.’

‘In my view, core competencies are derived from assets that generate competitiveness which were the products of the commitment of the decision makers to the investment projects.’

Building path

‘Our core competencies are gained by acquisition of desired assets, integration and transformation of business at the right time, and our commitment to our strategic development directions.’

‘We build our core competencies mainly by adjusting our operation models and business transformation.’

‘To build our core competencies, we built our marketing network, accumulate customers, and cooperate with ocean shipping firms.’

Typology

‘I have the view that core competencies can be classified into four types: the resources-based type, the operational-based type, the management-based type, and the intellectual-based type. The core competencies our company possesses now belong to resources-based type, which means that our competencies are derived from the services of our resources. I hope some day ours will become a management-based type.’

Relationship

‘Our core competencies are derived from our unique tangible assets (i.e., cargo and ferry ports) and other resources such as passenger ferry operating qualification, and shipping safety management qualifications. There would be no core competencies, and business, if we have no such unique assets and resources.’

‘Tangible assets and the building for core competencies are complementary, and they reinforce each other because tangible assets help to cultivate and reinforce core competencies. In addition, core competencies facilitate investments in tangible assets.’

It is a positive cycle relation.'

'I have the view that the characteristics of the management team, not just the individual's characters, may affect the corporate decision-making. The style of the management team is formed by corporate culture and individuals' characteristics, and such style can be either conservative or aggressive. Eventually, the style of the management team will determine their decision preferences.'

Development phase

'The application of the resources-based core competencies and the management-based core competencies depends on the phase of the development of a firm. My understanding is that, for resources-based type of core competencies, the change of the management may not affect significantly the operation and the management of the firm because the competencies are determined by resources and the fixed models of operation. For management-based type of core competencies, the competencies are more reflected on the managerial flexibility in response to market changes. Such competencies are straining capabilities.'

(Source: Annual reports and transcripts of Case 3)

Table 9 Combined representative data: Case 4

Representative Supporting Data for Each Second Order Theme	
2nd Order Themes	Representative 1st Order Data
Critical event	
Environment change	
<p>‘The industry structure of a cargo base is determined by the cargo structure of a port, and the industry development pace. Steady development of logistics facilities will benefit sources of cargo to port.’</p> <p>‘We encountered complex changes of global economy and the turbulence of the US-China trade in 2019.’</p> <p>‘Our business is affected by the impacts of Covid-19 pandemic and the change of the domestic development mode. In addition, the trend of integration of port industry will continue, and the traditional competition in terms of cargo volume will be changed into competition in terms of services, efficiency, and costs.’</p> <p>‘The Government policy on environmental protection will affect the operation of the company in terms of safety requirements and costs.’</p> <p>‘The change of industry structure of the cargo base determined the cargo structure of a port. In addition, our cargo sources are also affected by the local economic and trade development, and the efficiency of the logistics facilities in cargo hinterland.’</p> <p>‘We capitalized on the opportunities arising from the Government’s “Belt and Road” initiative, and we considered that plenty of business opportunities will arise from the “Great Bay Area” development, whereby derived logistics services will emerge.’</p>	
Structure change	
<p>‘Our company was reorganised in 2016 and listed in China, in 2017.’</p>	
Responsive strategy	
Decision process	
<p>‘One of the problems of SOE is the delay in decision-making processes; such delay may lead to missing development opportunities to rivals.’</p>	
Operating ideology	
<p>‘Quality services, efficient operation, and reasonable prices are the values we deliver to customers.’</p>	

Marketing strategy

‘We adopted a flexible pricing policy. For example, we fixed our prices at the bottom line to attract customers when our new ports commenced business. When our customers became stable, and our services are improved to meet customers’ new demands; we may adjust our pricing policy accordingly.’

Financial leverage

Regarding acquiring assets, we used various methods including financial lease of heavy assets, where the market prospects are not certain.’

Transformation

‘We launched a soft services program which is the operating transformation by using informational technologies. Whereby, our customers can access the information about the movement of their cargos, and complete settlements of their consignments.’

‘We conducted transformation projects for intelligent operations, and we have made great achievements in our projects of building intelligent ports. In our intelligent ports, block chain platform was put into use; and the digitalised platform, for Customs clearance and port documentation processing, commenced operation in 2019.’

‘We adopted the development strategy of operational intelligence and automation to elevate operation efficiency and intelligent services.’

‘The company persisted in operational innovation in terms of business models and upgrading assets. The company promoted the construction of intelligent port operation, paperless information processing, and digitalised operation platforms.’

Knowledge

Experience

‘We need to identify our customers before we can talk about our core competencies.’

‘Our port investments and configuration of equipment depend on our investigation and prediction of our business growth. The configuration also depends on our knowledge and experiences.’

Path dependency

Vision & mission

‘We engage in port construction and operation as our core business including terminal cargo handling and storage. We also provide full range of logistics services with our extended industry chain.’

‘We aim to build our port into a ‘world-class port’.’

Development strategy

‘Our business development follows the principle to invest in core business projects.’

‘We conducted core businesses related business and auxiliary business that complementary to our core businesses. We replicated our development models in other port investment projects in Guangdong, China.’

Collective learning

Understanding investment needs

‘Knowledge and prediction of our industry help us better understand the need for incremental investments in terminals.’

Sustainable process

Integration

‘One of the difficulties of the integration of resources is the culture integration. For example, SASAC may allocate one SOE with assets and staff together to another SOE, this kind of asset allocation may cause the conflict of corporate cultures of these two firms. It is always not easy to integrate such differences.’

‘We deepened the integration of equity JVs and cooperative enterprises at the upstream and downstream of the industry chain to explore value added services.’

‘The objectives of our integration of resources are to build a full logistics chain and a port network as operating platforms.’

Coordination

‘At different development stages, we took priority in cooperation with different interested partners. For example, at the initial stage of our business in new ports, we mainly focused on close cooperation with shipping firms. While we became known to cargo owners; we cooperated with them to provide tailor-made logistics services.’

Motive of integration

‘The motive of integration is to enhance our bargaining power, which is the reflection of synergy.’

Intelligent operation

‘Intelligentization is the driver to elevate operation efficiency, and reduce operating costs. We facilitate intelligent port services by enhancing the innovated integration of

informationalization with traditional business based on customers' demands.'

Informationalization

'We expedited our building of information systems including intelligent port, dispatching, intelligent tally, intelligent shipping, intelligent towing services, and the platform of the port and Customs clearance.'

Cooperation

'We enhanced cooperation with related parties including railway companies and shipping firms for joint marketing.'

Marketing effort

'We persisted in innovation of business models. We open new routes to destinations of the eastern ports of US, and ports in northern Europe. We expanded new overseas services in Vietnam, and Cambodia, and we explored new shuttle feeder services routes, and sea-rail linked trains.'

'One of our main tasks is our leverage function as a hub port in southern China.'

Optimal resources amassment

Typology

'Our assets are mainly VRIN tangible assets because such tangible assets can satisfy customer's needs.'

Purpose

'The purpose of maintaining a reasonable size of resources is to provide better services to customers in alignment with the increase of cargo volume.'

'VRIN assets are the basis of our core competencies.'

Adjustment window

'The adjustment of our asset portfolio, in terms of proper timing for construction of terminals or increase of handling equipment, should depend on our development plan and strategic persistence.'

'We allocate our resources to match the operating conditions in terms of volume of cargo and the frequency of shipping schedules.'

Criteria

'The location of a port is critical to our investment, and it is subject to the local industry development. Even a port dominates a prime geographical location in terms

of deep water; it may still not be able to survive, if there is not industry production that generates cargos for the port.’

‘Our main assets dominated a superior geographical location in a juncture of the river network and deep water ports. Our ports connect with national rail systems, express high ways, airfreight, and river trade systems, and such ports are capable to provide river-sea and sea-rail linked transportation.’

Configuration

‘Our aim is to build our port into an international ship hub in southern China.’

‘The principle of configuration of assets is that we allocate operating assets accordingly to operating conditions which are based on our predictions of business growth.’

‘We expedited our construction of key projects including container terminal, vehicle terminal, grain terminal, general terminal, grain warehouse, and the international logistics centres.’

‘The methods to configure our asset base include: outsourcing; using free hold or leased hold assets and Government’s allocation of assets from other parties; improving functions of assets; and disposing non-performing assets.’

Upgrading assets

‘We continue to upgrade our operating assets by expanding terminal spaces, constructing logistics centres, and building automatic container yards.’

Core competencies

Embodiment

‘Our ultimate customers are cargo owners we serve, while shipping firms are the carriers of the value of services we delivered.’

‘Our core competencies are reflected on services to diverse customers and business formats such as different types of charter of ships (i.e., time charter or voyage charter). We are not just serving shipping firms.’

‘Core competencies are reflected in services we provided; this is my persistent view of core competencies.’

‘Our core competencies were reflected on our services quality and cargo handling efficiency.’

Our core competencies were also reflected on our logistics facilities because such

facilities can satisfy the requirements of our customer.’

‘VRIN assets are carriers of core competencies because they can deliver required services. For example, if you have appropriate warehouse for storing grains, then you have the competitive advantage over your rivals.’

‘Our core competencies are demonstrated in six aspects. They are advantageous geographical position of our ports, vast cargo hinterland, enhanced functions of hub port, superior business environment, integrated operation platform, and elevated operation and management.’

Basis of building

‘We viewed that possessing core rare resources are the basis for building our core competencies because core resources guarantee bargaining power and marketing positions.’

Building path

‘To build our core competencies, we leveraged our advantages as a hub port, and we transformed from a traditional logistics services company into a modern logistics enterprise aiming at building a ‘big port, big logistics, and big economy.’

‘Methods used to build our core competencies include optimising our layout of port, developing green and safe ports, participating in overseas cooperation, enhancing our services quality and operation efficiency, building intelligent ports, and speeding up infrastructure construction of ports.’

(Source: annual reports and transcripts of Case 4)

Table 10 Combined representative data: Case 5

Representative Supporting Data for Each Second Order Theme	
2nd Order Themes	Representative 1st Order Data
Critical events	
Environment changes	
<p>‘Port industry was affected by international and domestic environmental challenges. In 2019, we sustained the impacts from the critical events of global trade tensions, US-China trade friction, the Covid-19 pandemic, and Britex. The domestic changes include the integration of port resources, the integrated development of regional ports, and the optimisation of port functions and business structures.’</p> <p>‘We encountered difficulties such as over capacity of port operation and increase of costs.’</p>	
Responsive strategies	
Competition	
<p>‘Regarding competition, we pursue the strategy of differentiated competition because we occupy deep water port resources which are suitable for ocean going shipping business. We are positioned as the ocean going shipping port.’</p>	
Operating ideology	
<p>‘We emphasised on exploring the utilisation efficiency of our entire resources including tangible and intangible resources.’</p> <p>‘We aim to serve customers with quality and efficiency in services.’</p>	
Sources of profit	
<p>‘In my view, our revenue comes from three resources: operating, asset appreciation, and the benefits derived from hedged costs.’</p> <p>‘The values we delivered to our customers are service quality and operating efficiency.’</p>	
Shifting economic centre	
<p>‘We should have a shifting view that the economic development centre of a place may shift away from its original place because of the change of the market situations and the changes of Government policies.’</p>	
Integration	

‘We expand our business by integrating upstream and downstream operations of the industry chain.’

‘One of our business strategies is to integrate port related business into a full industry chain which includes cargo handling, storage, and distribution.’

‘To hedge operating risk, we need to expand to auxiliary logistics services using the warehousing logistics facilities adjoining our port.’

‘Our excellent corporate brand shall be leveraged in marketing.’

Knowledge

Accumulation

‘The firm recognised the needs to coordinate the construction and investment pace of new ports projects, explore markets, retain operation professionals, integrate port resources, and enhance the development awareness to seek overseas development opportunities.’

Path-dependency

Vision & Mission

‘Our vision is to become an integrated service provider of port investment and operation.’

‘Our mission is to provide integrated services including bulk, partial cargo and containerized cargo, and multimode transportation services.’

Development strategy

‘Our development strategy is to adhere to investing and operating ports as our core business and developing our port services supply chain and port industry clusters.’

Collective learning

Collective adoption

‘Cognition should be collectively recognised and adopted in the organisation. If we do not have the cognition, we will not have any actions.’

‘Our successes were groped through practice by virtue of our franchise operation.’

Practice

‘Successes are derived from correct cognition; therefore, we need practice and action.’

Transformation of cognition

‘The concept of core competencies should have two layers, the essence and the

appearance; there is a correlation between these two, but they are not equal. The issue here is the transformation method of essence to its appearance. It is interesting to know under what conditions; inherent cognition will be transformed into extrinsic cognition.’

Sustainable processes

Cooperation

‘The company invested and constructed three new ports through cooperation with local firms in other places in southern and northern China since 2013.’

Coordination

‘We work closely with international major shipping lines through our JV partners, and we become an important part of their global operation.’

‘Our core businesses are port construction, operation, and management, and we are doing very well in coordination of investment and construction of ports.’

‘Our equity JV with a world-class port operator enables us to better leverage our domestic port resources and capitalize on overseas development opportunities.’

Integration

‘The firm expanded its business by integrating its core business with its auxiliary businesses, and it has built the full industry chain and supply chain.’

Optimal resources amassment

Adjustment window

‘We installed cargo handling equipment in advance, and we increased such equipment in line with the incremental momentum of the business.’

Synergy

‘When we consider an investment project; we need to consider the correlation of this project with the existing projects to see if we have the synergy.’

Configuration

‘We adopted measures to consummate port functions of new ports to elevate our competitiveness.’

‘We used certain methods to build our resources base, including integration of regional port resources, development of regional ports, optimization of port functions, and restructuring business alignment.’

Core competencies
Embodiments <p>‘Our core competencies were reflected in our franchise operation because our franchise awarded by the Government guaranteed our opportunity to run the business. Franchise is the policy resources.’</p> <p>‘Ours is a large deep water port capable of accommodating mega-vessel operations, and our container throughput ranked top one in the world in terms of a single port area. Our core competencies were reflected on our prime natural conditions of ports, the access to the most developed economic hinterland of cargo, the advanced and efficient operation and management, and our brand advantage.’</p>
Development phase <p>‘I have the view that core competencies possessed by a firm are different at different stage of the development of the firm, and they can be classified at different levels. Core competencies incarnate at different stage of the business cycle.’</p>
Building path <p>‘We built our core competencies through business coordination of railway transportation, and the increase of terminal handling capacity. We consummated the layout of ports by conducting new investment of ports, and we also built a full industry chain including warehousing and auxiliary services, i.e., shipping agents, freight forwarding, Customs clearance, and land transportation.’</p> <p>‘We maintain our trustworthy brand by providing efficient terminal operation.’</p> <p>‘We acquire VRIN assets and build green ports.’</p>

(Source: annual reports and transcripts of Case 5)

Table 11 Combined representative data: Case 6, Case 7, and Case 8	
Representative Supporting Data for Each Second Order Theme	
2nd Order Themes	Representative 1st Order Data
Critical events	
Environment changes	
<p>‘The Chinese port industry is now undergoing integration of port resources because of the tension of globalisation of trade and competition. However, globalisation of economy and trade will continue, despite of such tensions and the uncertainty of US-China relationships.’</p> <p>‘The business of port operators in China is affected by Covid-19 pandemic.’</p> <p>‘The port industry is undergoing a major change of port integration.’</p>	
Responsive strategies	
Operating ideology	
<p>‘The foreign partner of Case 5 adopted the global marketing strategy to conduct business, not just by individual port operation, and profit is the paramount concern of their business.’</p>	
Global marketing	
<p>The foreign partner has its own global marketing strategy and operation layout of port and shipping lines services.’</p> <p>‘Logistics services in Shenzhen are up to the world standards, and the container throughput of Shenzhen ports ranked No.4 in the world in 2020.’</p>	
Transformation	
<p>‘In alignment with the Government policy of the “Greater Bay Area” development, the local Government is now launching the plan to build two international hub ports in Guangdong, one in Shenzhen and the other in Guangzhou. Hong Kong will remain as the international shipping centre.’</p> <p>‘Now a full scale digitalised transformation is underway in Shenzhen in terms of intelligent port, intelligent logistic, and internet. It is a revolution in science and technology.’</p> <p>‘We launched Asia’s No.1 international logistics exhibition in Shenzhen, promoting Shenzhen as a benchmark in logistics industry to the world.’</p>	

Development opportunities
‘Due to “reform and opening-up” policy, we need to change our ideology and understand our responsibilities. We should capitalise on the development opportunities derived from the ‘Greater Bay Area’ development and the ‘Belt and Road’ initiative.’
Knowledge
Experience
‘Without cognition of informationalization, it would not be possible to pursue information services. Cognition, learning, and ideology are essential in informationalization.’
‘To build core competencies, we need talents who are equipped with strategic thinking, modern logistics knowledge, and theories of globalisation.’
‘To be big or to be strong is radically different; we need to know how to be strong. If we do not have the cognition to be strong; we will not consider strive for being strong.’
‘One of our valuable lessons is that we should insist on inclusion of an exclusive clause in port development projects to avoid the risk that local Governments may award permissions to late comers for similar projects in the region.’
Path-dependency
Vision & mission
‘Different firms have different missions. As an SOE, it has certain social responsibilities, but it should be also profitable.’
Collective learning
Learning method
‘One way of learning is to learn from partners. One of the leading ports in Shenzhen is keen to learn from its equity JV partner which is a global major port operator’.
‘We must learn from our partners especially in management and operation because learning from our partners will enhance our operation for good results. We must catch up with and learn from advanced examples from the world; only in this way we can make progresses.’
‘We still have rooms to improve and catch up with or overpass world class standard operation in terms of management efficiency, service ideology, and operating

efficiency.’

‘Our logistics industry needs professionals, especially international freight forwarding talents. Our training centre aims to train technicians for Shenzhen logistics industry.’

‘As our business and assets grow, we need to change our minds and align with modern development situation. Business growth required us to change our thinking. Changes of assets require our mindset to catch up with such changes. We must learn in align with the changes in business and operation.’

‘We have visited a lot of countries, and we saw what we needed to see. Then, we replicated what we had learned from counterparts in our daily operation and management, and we put what we had learned to practice.’

‘After 30 years’ of efforts and the accumulation of technologies, funds, and talents, we became stronger and capable to operate modern ports through learning and practice.’

‘We learned from partners and also from legal perspectives. For example, when we negotiated new projects with local Governments; we had to be aware of risk avoidance.’

‘We need to sum up our experiences, promote our advanced logistics management experience, set benchmarks in the world, and replicate our successful operating models.’

‘Our training programs include internal training, Government’s subsidized training, own expenses training, and Government supporting training.’

‘We invited qualified teachers and maintain close relationships with port operators for training practice.’

Cognition

‘The building of core competencies is a continuing process, especially in the utilisation of resources; thereby, we can gain knowledge of effective utilisation of such resources.’

‘International forwarding services is a link in the logistics industry chain and supply chain; therefore, we must understand the process of international freight forwarding, and the logistics industry.’

‘We need to be equipped with modern logistics knowledge and theories of globalization as premises of building core competencies.’

Sustainable processes

Coordination

‘A single port functions like a workshop, and its operation directives are subject to the operation control centres.’

Application of technology

‘Shenzhen will have the first automatic port which includes berths No.1 to berth No.4 in 2021.’

‘The application of block chain technologies will enhance information services functions, and credential security; therefore, it will enhance core competencies.’

Integration of port resources

‘Port constructions were overlapped, and ports’ functions are similar; therefore, the plan of integration of port resources was carried out to avoid cutthroat competition among peer operators.’

‘Now integration of ports in Guangdong is underway, but it is difficult because of the complex stakeholders and the involvement of different Governments.’

‘The purpose of integration of port resources is to avoid competition for enhancing competitiveness.’

‘The plans of integration of ports were initiated by Governments in different places in China. It is a Government policy. The integration in some places in the eastern China was completed, and fewer progresses were made in Guangdong.’

Optimal resources amassment

Typology

‘There are different professional ports in Shenzhen serving different customers in different industries such as container, LNG, and bulk cargos.’

Configuration

‘The port industry in Shenzhen consists of SOEs and foreign equity JVs located on the eastern and western parts of Shenzhen. Over the past few years, integration of ports in Shenzhen had been taken place. In Shenzhen, local terminals include container, petroleum, and chemical terminals.’

‘There was a Government plan to integrate all ports in Shenzhen; but such a plan failed because of the complexity of share structure of firms. However, the plan to integrate SOEs was a success. The total container throughput of containers in Shenzhen ports ranked No.4 in the world in 2019.’

‘A full scale of application of advanced technologies is underway in Shenzhen, including 5G, AI, VR, AR, Internet, internet of things, and big data.’

Features of resources

‘A port as a shipping centre relates to different industries: rail, road, sea and air. It provides a variety of logistics services including transportation, distribution, allocation, and consolidation. It connects directly to global logistics activities.’

‘A port is an integrated transportation hub for exchanging mode of transportation and a centre of logistics information and services.’

Core competencies

Embodiment

‘The critical factors for port industry are the management effectiveness, management efficiency, and operating efficiency. Therefore, we need talents to achieve these goals. Core competencies are reflected in operating efficiency, management efficiency, and cost effectiveness.’

‘Core competencies were reflected in scale of operation and consummate functions of port.’

‘Core competencies should be reflected in on-line business of port industry.’

‘Core competencies should be reflected in high end port services including legal and insurance.’

‘Ports have three main functions: conversion centre of transportation modes, information centre, and services centre. For these functions, core competencies shall be built. These functions should satisfy the needs of customers in terms of smoothness, hub port services, and conversions of transportation modes.’

‘Ports should have the capability to provide modern information services for business transactions, on-line booking, freight settlement, and arrangement of transportation services.’

‘Core competencies of a firm are reflected in the management team in terms of knowledge, ideology, and experience of talents.’

‘The core competencies of Case 5 were reflected on its close cooperation with its partner in terms of global operation.’

Building path

‘One of the best ways to build core competencies is to have good equity JV partners. One of the leading port operators in Shenzhen had a good equity partner, and the firm

has been operating very successfully.’

(Source: Transcripts of Case 6, 7 & 8)

Table 12 Synthesized representative data: All Cases

2nd Order themes	Representative 1st order data
Critical events	
Exogenous critical events	
	<p>‘Changes in the global environment, politics, and economics matter [it is like] life or death to businesses.’</p> <p>‘The world economy is deeply integrated, and the landscape of politics and the economy of the world are undergoing historical changes.’</p> <p>‘Our firm’s businesses were influenced by the changes of global trade, the reforms of international and domestic supply side.’</p> <p>‘Affected by the global macro-economic changes, the Chinese domestic shipping market also encountered low ebb and a continuing correction period. Accordingly, mergers and acquisitions, large-scale and intensive operations became the main development trend in the industry.’</p> <p>‘As an SOE, any policy changes of SASAC will affect our operations.’</p> <p>‘International industry competition became more intensified because more major market players are participating in international bidding for cargo carriage contracts.’</p> <p>‘Old fashioned logistics contexts are about the operation extensions to upstream or downstream; now the logistics context needs to be rebuilt according to the needs of customers. We need to build a new fashion of ecosystem for allocating different resources.’</p> <p>‘The logistics industry in China is now in the process of operational transformation; it is called iterated transformation. It is a hot topic and the development trend of the industry.’</p> <p>‘In fact, digitalised transformation is used to remould our traditional business models for elevating operating efficiency, and to maximise operating results. The strategy is to build a new shipping context and a new logistics ecosystem.’</p> <p>‘The emergence of 5G technology has changed the traditional competition style, and it is an irreversible change that is beyond our imagination.’</p> <p>‘We are now conducting a digitalised transformation program in operation.’</p> <p>‘We are now engaging in two things: a digitalised platform by application of digitalised technologies and gathering data.’</p> <p>‘I feel that the competition is not traditional competition in terms of quantity or price;</p>

it is about the application of technology, especially 5G. The emergence of this technology will change the traditional competition style, and it will be subversive to our imagination.’ Case 1

‘Our businesses were affected by the impacts of Covid-19 pandemic and the changes of the domestic development mode. In addition, the trend of integration of port industry will continue; and the traditional competition in terms of cargo volume will be changed into competition in terms of services, efficiency, and costs.’

‘The main triggers of our strategy change are the changes of the market conditions and the Government policies such as the national strategy of “Belt and Road” initiative. Our company is the pioneer in pursuing overseas development strategy among SOEs in China.’ Case 2

‘The growth momentum of the global economy remained weak in 2019, and the US-China trade friction and geopolitical tension affected the global economy and trade.’ ‘The company is confronted with the complex and changing external environment.’

‘The improvement of navigation channels accommodated calls of mega-vessels to our terminals.’

‘The main triggers of our strategy change are the changes of Government policies, the market conditions in terms local ports competition, and the overseas development strategies among SOEs in China.’

‘The environment opportunities are the potential business arising from the Government’s policies of “Belt and Road” initiative and the development plan of the “Greater Bay Area”.’ Case 2

‘Our cargo handling businesses at terminals were severely affected by the US-China trade friction and the changes of the Government’s environmental protection policy.’

‘Currently we are encountering negative impacts to our passenger ferry business due to the improvement of land transportation and the opening of the Hong Kong-Zhuhai-Macau bridge. Our business has also been affected by the US-China trade friction. These are the market’s impacts on our business.’

‘I have the view that the fundamental market and environment factors changed swiftly and dramatically in terms of Government policies, relations among countries, changes

of our internal staff, and the changes in infrastructure in China.’

‘Our businesses were affected by the environmental changes, e.g., US-China trade friction, geopolitical tensions, the opening of Guangzhou-Shenzhen-Hong Kong express rail link, the opening of the Hong Kong-Zhuhai-Macau Bridge, and the opening Nansha Bridge. The challenges of trade friction and geopolitics impacted the cargo shipping industry, and the improvements of infrastructure of road transportation affected our passenger ferry business.’

‘We encountered US-China trade friction and the Covid-19 pandemic, which affected our business severely.’

‘The group drives forward the “second venture” strategy and exploits business and investment opportunities in the development of the Guangdong-Hong Kong-Macau ‘Greater Bay Area’ in order to transform and upgrade our core businesses for sustainable growth.’

‘We seized the development opportunities arising from the strategy of “the airport economy” and the “bridge economy”, and we expanded storage and cold chain facilities. One of our ports in Zhuhai became the designated port for imported refrigerated cargos by the local Government.’

‘In response to the national initiatives of “Guangdong-Hong Kong-Macau Greater Bay Area” and overseas development (i.e. “Belt and Road” initiative), the company seized opportunities to enhance its two platforms: cross-border passenger investment and capital operation, so as to accelerate business transformation and to promote innovation and development.’ Case 3

‘The industry structure of a cargo base is determined by the cargo structure of a port and the industry development pace. Steady development of logistics facilities will benefit sources of cargo to port.’

‘We encountered complex changes of the global economy and the turbulence of the US-China trade in 2019.’

‘Our business will be affected by the impacts of Covid-19 pandemic and the change of the domestic development mode. In addition, the trend of integration of port industry will continue, and the traditional competition in terms of cargo volume will change into competition in terms of services, efficiency, and costs.’

‘The Government policy requirements on environmental protection will affect the operation of the company in terms of safety requirements and costs.’

‘The change of industry structure of the cargo base determined the cargo structure of a

port. Our cargo sources are also affected by the local economic and trade development and the efficiency of the logistics facilities in cargo hinterland.’

‘We capitalized on the opportunities arising from the Government’s ‘Belt and Road’ initiative, and we considered that plenty of business opportunities will arise from the “Greater Bay Area” development, whereby derived logistics services will emerge.’

Case 4

‘Port industry was affected by international and domestic environmental challenges. In 2019, we sustained the impacts from the critical events of global trade tensions, US-China trade friction, and Britex. The domestic changes include the integration of port resources, the integrated development of regional ports, and the optimisation of port functions and business structures.’

‘We encountered difficulties including port operation over capacity and the increase of costs.’ Case 5

‘The Chinese port industry is now undergoing integration of port resources because of the tension of globalisation of trade and competition. However, globalisation of economy and trade will continue, despite of such tensions and the uncertainties of US-China relationships.’

‘The business of port operators in China was affected by Covid-19 pandemic.’

‘The port industry is undergoing a major change of port integration.’ Cases 6,7 & 8

Endogenous critical events

‘The company was reorganized from two key SOEs in 2016.’

‘The causes of the merger of the company were the current severe international competition in logistics industry and the need for business transform, for production effectiveness and efficiency, from traditional operation into informationalized operation and management.’

‘The merger of two giant SOEs of the central Government caused reorganization of corporate management structure, changes in business strategies, business reorganization, and integration of resources.’

‘One way to cope with challenging operating environment is to change management team members.’ Case 1

‘The company was merged from two Chinese port operators in 2018.’ Case 2

‘We became a listed company early in 1997, and this structure change enabled us to secure our industry position in terms of bargaining power and financial strengths.’

‘The main operating weakness is the higher costs in some terminals as compared with the benchmarking terminals in the same region because some of our terminals are located far away from cargo sources. Accordingly, we strengthened the cooperation of the overall supply chain with customers to increase customer loyalty.’

‘One of our wholly-owned cargo terminals was expropriated by the local Government because the permission to operate it as a cargo terminal was revoked by the Government in 2017.’ Case 3

‘Our company was reorganised in 2016 and listed in 2017.’ Case 4

Responsive strategies

Global marketing

‘The important thing is to understand the needs of customers and satisfy their needs in our development plan.’

‘As a shipping service enterprise, the goal we pursue is to realise our customers’ values through advanced, quality, and efficient full supply chain services by our integrated industry chain.’

‘We adopted the operating ideology of “market orientation and customers as the centric businesses”.’ ‘We uphold the principle to consummate customers’ service systems, maintain closer communication with clients, and satisfy their needs.’ Case 1

‘Our immediate customers are international shipping companies. We followed advanced examples of global port operators for international marketing because it is our critical operating activity.’

‘The key task of port operators is to take the proactive attitude to explore the market.’

‘Different equity structure determines different management control. Our company is an SOE of the central Government, and it is run by domestic staff. We learned from our examples of international major port operators, and we are active in operation and management innovation. We take the differentiated development strategy.’

‘The firm elevated its operation capabilities and its global market influence by

building up its global port network. The firm seized investment opportunities offered by the 'Belt and Road' initiative to develop overseas projects.'

'Our development depends on our market share, business momentum, and the resources available.' Case 2

'Changes of market conditions caused changes of our strategic decisions. For example, we hedged the negative impacts to our cross-border passenger ferry services by entering the local ferry business.'

'Our business strategies are also affected by the shift of business centres, and the business risks; for example, now the operation centre is shifting from Tuen Mun in the eastern part to the western part of Hong Kong with container terminals and airfreight operation in the area.'

'We conducted flexible marketing strategies by providing customers with tailor-made logistics plans to reduce clients' transportation cost in order to attract new clients especially in the "Greater Bay Area".'

'For passenger ferry services, we arranged flexible sailing schedules by increasing sailings in public holidays and peak hours.'

'One of our competition strategies is to integrate port resources into strategic business units by centralising management to compete with competitors.'

'To rely on informationalized operation is one of our imperative strategies in competition, not just rely on operation assets available.' Case 3

We adopted a flexible pricing policy. For example, we fixed our prices at bottom line to attract customers when our new ports commenced business. When our customers became stable, and our services are improved to meet customers' new demands; we may adjust our pricing policy accordingly.'

'Quality services, operation efficiency, and reasonable prices are the values we deliver to customers.'

'Our ultimate customers are cargo owners we serve; while shipping firms are the carriers of the value of services we delivered.' Case 4

'Regarding competition, we pursue the strategy for differentiated competition, because we occupy deep water port resources which are suitable for ocean going shipping business. We are positioned as the ocean going shipping port.'

‘In my view, our revenue comes from three resources, operating, asset appreciation, and the benefits derived from hedged costs.’

‘The values we delivered to our customers are service quality and operating efficiency.’

‘We should have a shifting view that the economic development centre of a place may shift away from its original place because of the change of the market situations and the changes of Government policies.’ Case 5

‘The foreign partner has its own global marketing strategy and its operation layout of port and shipping lines services.’

‘Logistics services in Shenzhen are up to world standards. The container throughput of Shenzhen ports was ranked No.4 in the world in 2020.’ Cases 6,7 & 8

Enhancing management

‘One way to cope with a challenging operational environment is to change members of management team.’

‘Reshuffling members of management team is an effective way to improve management. Although our group has huge assets, the operating profit is not satisfactory. Accordingly, reshuffling of management was taken place, and our operation performance is now improving because of the change in operation and management.’

‘Top management team was reshuffled; accordingly, new management strategies were developed. Especially, the top management changed the focus of management from the old style of production management to emphasize on capital assets management at the top level with greater degree freedom to SBUs.’ Case 1

‘Different equity structures determine different management control. We are an SOE run by domestic staff. We learned from our examples of international major port operators, and we are active in operation and management innovation. We take the differentiated development strategy with a global perspective.’ Case 2

‘I have the view that the characteristics of the top management members are the substantial influential factors in our strategic decision-making because their different backgrounds and working experiences will affect our decision-making.’

‘Limitations on decision making include high turnover of top management members and empowerment by higher level authorities.’

‘As far as an SOE is concerned, our investment decision authorities are limited. Whenever an investment project exceeds a limit in terms of funds commitment to an investment, such project shall be subject to several higher levels’ approval. Hence, we may lose our market opportunities because of delays in the decision-making process. Our decision empowerment is generally not sufficient to respond to swift market changes.’

‘In investment decision-making process, we follow SASAC’s directives regarding limits of funds commitments, core business related projects, and ROA required.’

‘Changes of market conditions caused changes of our strategic decisions. For example, we hedged the negative impacts to our cross-border passenger ferry services by entering the local ferry business.’ Case 3

‘One of the problems of SOE is the delay in decision making process; such delay may lead to losing development opportunities to competitors.’

‘Quality services, efficient operation, and reasonable prices are the values we deliver to customers.’ Case 4

‘We emphasised on exploring the utilisation efficiency of our entire resources including tangible and intangible resources.’

‘We aim to serve customers with quality and efficient services.’

‘The foreign partner of Case 5 adopted the global marketing strategy to conduct business, not just by individual port operation; and it holds that profit is the paramount concern of business.’ Case 5

Intensifying operation

For acquiring assets, we used various methods including financial lease of heavy assets where the market prospects are not certain.’ Case 4

We expand our business by integrating upstream and downstream operations of the industry chain.’

‘To hedge operating risk, we need to expand to auxiliary logistics services by using the warehousing logistics facilities adjoining our port.’

‘Our excellent corporate brand shall be leveraged in marketing.’

‘One of our business strategies is to integrate port related business into a full industry chain which includes cargo handling, storage, and distribution.’

‘We emphasise exploring the utilisation efficiency of our entire resources including tangible and intangible resources.’

‘Fore competition, we pursue the strategy for differentiated competition because we occupy deep water port resources which are suitable for ocean going shipping business. We are positioned as the ocean going shipping port.’ Case 5

Transformation & innovation

‘Digital transformation means the utilisation of advanced digital technologies to change the traditional business models.’

‘The whole context of the logistics industry should be rebuilt, which is not the traditional way of operation extension to upstream and downstream of the industry chain. The industry needs to build an entire new fashion of an ecosystem as a tool to allocate different logistics resources to satisfy customers’ needs.’

‘We are transforming from a traditional competition player in terms of shipping routes into a world class integrated supply chain service provider.’

‘Our company will integrate resources including ship-fleet, network, products, marketing, and talents to facilitate organic growth, allocation of resources, market exploration, and consummate global layout of resources and operation.’

‘We aim to provide full coverage of customers’ services through upstream and downstream operations of the supply chain, and we consummate our industry chain by building ‘6+1’ industry clusters. Our industry chain includes (1) shipping industry, (2) shipping finance, (3) logistics industry, (4) equipment management, (5) shipping service, and (6) social industry and internet related business.’ Case 1

‘The company launched the digitalisation strategy and continued to build ‘e-Port’ in a large scope.’

‘The innovation projects involve operating models including capital management, integration in business operation, internet technologies, e-commerce, and a refined management information platform.’

‘The firm is now transforming one of its general cargo terminals into an automatic, intelligent, green, and low carbon container terminal.’ Case 2

‘One cause of our strategic change was the change in the global trade environment; another cause is the change in domestic demand. Accordingly, we adopted the business transformation strategy by engaging both foreign trade and domestic trade.’

‘In 2017, we changed to provide full logistics services by integrating our marketing network, warehousing, and the terminal network.’

‘We entered the airfreight business with the Hong Kong international airport because we have the logistics base in Tuen Mun which is very near the airport across the Hong Kong harbour. In addition, we possess warehouse facilities, X-ray inspection equipment, cargo handling facilities, and transportation means.’

‘We built a warehouse equipped with refrigerated storage and transportation facilities in Nansha, Guangzhou, to provide E-commerce business.’

‘We established an operation alliance (called South-China Express Line) with one of the leading port operator in Shenzhen to provide cargo feeder services among ports in Pearl River Delta and the port in Shenzhen for international shipping services.’

‘For different clients in terms of type of cargo and cargo locations, we developed tailor-made services plans to suit their logistics requirements by providing connected services to land transportation and railway transportation.’

‘Our business strategy is subject to impairment of tangible assets such as the breakdown of container handling cranes.’ Case 3

‘We adopted the development strategy of operational intelligence and automation to elevate operation efficiency and intelligent services.’

‘The company persisted in operational innovation in terms of business models and upgrading assets. The company promoted the construction of intelligent port operation, paperless information processing, and digitalised operation platforms.’

‘We launched a soft services program which is the operating transformation by using informational technologies. Where our customers can access the information about the movements of their cargos, and complete settlement of consignments.’

‘We conducted transformation projects in intelligent operation. We have made great achievements in our project of building intelligent ports, where our intelligent port and the block chain platform were put into use. The digitalised platform for Customs clearance and port documentation pressing commenced operation in 2019.’

Case 4

‘In alignment with the Government’s policy of “Greater Bay Area” development, the local Government is now launching the plan to build two international hub ports in Guangdong, one in Shenzhen and the other in Guangzhou. Hong Kong will remain as the international shipping centre.’

‘Now a full scale digitalised transformation is underway in Shenzhen for intelligent port, intelligent logistic, and *internet+*. It is a revolution in science and technology.’

‘We launched Asia’s No.1 international logistics exhibition in Shenzhen, to promote Shenzhen as a benchmark in logistics industry in the world.’ Cases 6,7,8

Capitalising on opportunities

‘The firm elevated its operation capabilities and its global market influence by building up its global port network, and it seized investment opportunities to develop overseas projects.’

‘Our development strategies will focus on the opportunities arising from the ‘Belt and Road’ initiative.’

‘The firm seeks to study closely the changes of macro-economy and industry development opportunities for growth.’

‘The firm facilitated the home-based port development projects by upgrading its port zone to capitalise on the opportunities arising from the local Free Trade Zone development.’ Case 2

‘Our decisions on investment projects depend on the opportunities arising from market changes, and such decisions are subject to core resources available at the time.’

‘To capitalize on market opportunities, we adjusted our operation strategy to enter the new business of airfreight logistics services for Hong Kong International Airport.’

‘Our five growth drivers are the “Greater Bay Area” airports, the Hong Kong-Zhuhai-Macau Bridge, development of Nansha, cross-border e-commerce, and overseas investment.’

‘We are now transforming part of our business to engage airfreight logistics services by deploying our terminal and warehouse facilities which dominate the prime geographical location near the airport.’ Case 3

‘We should have a shifting view that the economic development centre of a place may shift away from its original place because of the change of the market situations and the changes of Government policies.’ Case 5

‘Because of the ‘reform and opening-up’ policy, we need to change our ideology, and understand our responsibilities. We should capitalise on the development opportunities derived from the “Greater Bay Area” development, and the “Belt and Road” initiative.’

‘In alignment with Government policy of the “Greater Bay Area” development, the local Government is now launching the plan to build two international hub ports in Guangdong, one in Shenzhen and the other in Guangzhou. Hong Kong will remain as the international shipping centre.’ Cases 6,7 & 8

Knowledge

Knowledge management

‘Our company attached importance to the building of a team of talents. The key issue is to build our management team with a focus on management ideology and their capability of acute judgement of the market situation; otherwise, we may miss development opportunities or be disoriented.’

‘The firm established a knowledge management system with an aim to facilitate the accumulation and transmission of the firm’s knowledge and individual’s knowledge.’

‘The group provided internal training to staff to enhance their job related skills.’

‘One of the issues about intelligent port operation is how to apply it in our ports, and it needs professional judgement.’ Case 2

‘We continued to try to understand the needs of our customers, adjust services and prices on a timely basis, compare the advantages and weaknesses over competitors, enhance quality of service and customer satisfaction, and replace price competitiveness with services.’

‘The knowledge and experiences of the management will determine their preferences in investment strategies.’

‘The terminal logistics business is subject to machine failure and goods damage as certain machine and equipment has become obsolete. We have continuously strengthened equipment maintenance management and safety inspection, strengthened daily maintenance, improved employee’s safety and prevention awareness and operating skills, enhanced regular staff training and on-the-job training, and ensured operation in accordance with regulations.’ Case 3

‘Our port investments and configuration of equipment depend on our investigation and prediction of our business growth. The configuration also depends on our knowledge and experiences.’

‘We need to identify who are our customers before we can talk about our core competencies.’ Case 4

‘The firm recognised the needs to coordinate the construction and investment pace of new ports projects, explore markets, retain operation professionals, integrate port resources, and enhance the development awareness to seek overseas development opportunities.’

‘Our successes were groped through practice by virtue of our franchise operation.’

‘The concept of core competencies should have two layers, the essence and the appearance; there is a correlation between these two, and they are not equal. The issue here is the transformation method of essence to its appearance. It is interesting that under what condition, inherent cognition will be transformed into extrinsic cognition.’

Case 5

Experience

‘We have an experienced and professional operating and management team which provides customers with stable and secured services.’

‘We have a strong cargo carriage capacity, and we were ranked top one in the world in terms of bulk cargo transportation.’

‘Our development strategy from end-to-end on the supply chain was based on the changes of the mainstream of cargo sources. Our development strategies depend on changes within the market.’ Case 1

‘Decision makers with different backgrounds or professions affect investment decisions because decisions were made based on their past experiences and lessons.’

‘The knowledge and experiences of the management team will determine their preferences in investment strategies.’ Case 3

The configuration of our resources also depends on our knowledge and experiences.’ Case 4

‘Without cognition of informationalization, it would not be possible to pursue information services. Cognition, learning, and ideology are essential in informationalization.’

‘To build core competencies, we need talents who are equipped with strategic

thinking, modern logistics knowledge, and theories of globalisation.’

‘To be big or to be strong is radically different; we need to know how to be strong. If we do not have the cognition to be strong; we will not consider striving for being strong.’

‘One valuable lesson is that we should insist on inclusion of an exclusive clause in port development projects to avoid the risk that local Governments may award permissions to late comers for similar projects in the region.’

‘We need to sum up our experiences, promote our advanced logistics management experience, set benchmarks in the world, and replicate our successful operating models.’ Cases 6,7 & 8

Cognition

‘Core competence is about the knowledge of the industry, national strategy, and external conditions.’

‘Cognition on specific issues helps you to better develop strategy.’

‘In shipping business, we need to understand the values of customers before we can satisfy them by delivering those values they pursue; such values are safety, reliability, and credit of performance.’ Case 1

‘One issue about intelligent port operation is how to apply it in our ports. It needs professional judgment.’ Case 2

‘The building of core competencies is a continuing process; especially in utilisation of resources thereby we can gain knowledge of effective utilisation of such resources.’

‘International forwarding services is a link in the logistics industry chain and supply chain. We must understand the process of international freight forwarding and the logistics industry.’

‘We need to be equipped with modern logistics knowledge and theories of globalization as premises of building core competencies.’ Cases 6,7 & 8

Path-dependency

Vision & mission

‘Our vision is to become a world leading comprehensive logistics service provider.’

‘Our mission is to offer a synergistic platform connecting global shipping routes and

offering mutual benefits to all partners in the shipping industry.’

Case1

‘The company’s vision is to become a world-class comprehensive port service provider.’

‘The mission is to achieve a “world-class” level enterprise in various areas including global container throughput, market share, performance results, operational management capabilities, utilisation of assets, labour productivity, and brand name.’

Case 2

‘The vision of the company is to become one of the leading waterway passenger transportation operators in the world and a key logistics operator in “Guangdong-Hong Kong-Macau Greater Bay Area”.’ Case 3

‘We engage in port construction and operation as our core business including terminal cargo handling and storage. We also provide full range of logistics services with our extended industry chain.’

‘We aim to build our port into a “world-class port”.’

Case 4

‘Different firms have different missions. As an SOE, a company has certain social responsibilities, but it should be also profitable.’ Cases 6,7 & 8

Development strategy

‘Our development direction and the mode are customer oriented. We should configure our shipping assets and resources to satisfy our customers’ needs and their values.’

‘Our development strategy is to consummate a layout of industry clusters including shipping, shipping finance, logistics, equipment manufacturing, shipping services, socialised industry, and “Internet +” related business, through integration of shipping factors.’

‘Our development strategy, from end to end on the supply chain, was based on the changes of the mainstream of cargo sources. Our development strategy depends on changes of market.’

‘The firm capitalised on the opportunities arising from the State’s global strategy of “Belt and Road” initiative. Case 1

‘Our capital investments are based on our “Five-year plan” or the ‘Ten-Year Plan’, but not on ad hoc decisions.’

‘We followed our established development models for domestic and overseas projects, and our overseas investment projects are in alignment with Government policies. We capitalized on the opportunities arising from Government’s policies.’ Case 2

‘As an SOE, our investment and development are subject to the supervisory regulations, and the general guidance is our mission statement.’

‘Our investment projects should satisfy the SASAC’s two investment criteria: core business related and the requirements of rate of return. Recently, we acquired a local ferry business, and the project satisfied the requirements of SASAC.’ Case 3

‘We conduct core business related business and auxiliary business that are complementary to our core business. We replicated our development models in other port investment projects in Guangdong, China.’

‘Our business development follows the principle to invest projects which are core business related.’ Case 4

‘Our development strategy is to adhere to investing and operating ports as our core business and developing our port services supply chain and port industry clusters.’

Case 5

Government directives

‘We followed the Government’s directives to undertake digital transformation of our port industry.’

‘The firm capitalised on the opportunities arising from the State’s global strategy of “Belt and Road” initiative.’ Case 1

‘We followed our established development models for domestic and overseas projects. In addition, our overseas investment projects are in alignment with Government’s

policies such as the “Belt and Road” initiative.’ Case 2

‘Our investment projects should satisfy the SASAC’s two investment criteria: core business related and the requirements of rate of return. Recently, we acquired a local ferry business, and the project satisfied the requirements of SASAC.’ Case 3

Basis of decision making

‘I think the important thing for our decision-making is the strategic commitment of our decision makers to investment projects. We need strategic persistence because markets need cultivation.’

‘As far as an SOE is concerned, our investment decision authorities are limited. Whenever an investment exceeds a limit; such project shall be submitted to several higher levels authorities for approval. Therefore, we may lose our market opportunities because of delays in decision-market process. Our decision empowerment is generally not sufficient to respond to swift market changes.’ Case 3

Collective learning

Management capabilities

‘Top management members with professional knowledge and expertise about the industry are important to lead our company because the logistics industry is a capital intensive and knowledge intensive industry. It involves huge operating assets.’

‘I felt and recognised that staff with rich experiences and strong technical background helped build core competencies.’

‘We have an experienced and professional operating and management team, which provides customers with stable and secured services.’ Case 1

‘My view is that learning means coordination and integration, so we should follow our benchmark for efficient utilisation of resources.’

‘Our company attached importance to the building of a team of talents. The key issue is to build our management team with focus on management ideology and their capability of acute judgement of the market situation; otherwise, we may miss development opportunities, or disoriented.’ Case 2

‘Decision makers with different background or profession affect investment decisions because decisions were made based on their past experiences and lessons.’

Case 3

‘Knowledge and prediction of our industry help us better understand the need for incremental investments in terminals.’ Case 4

E-commerce thinking & practice

‘We have just established an internet company, and we visited some E-commerce companies in China. We learned how to integrate all business information including four flows: business information flows, commerce flows, commodity flows, and flow of funds. E-commerce has been developing fast, so we need the mindset of E-commerce and the integration of such thinking.’

‘Thinking is critical; without thinking, expertise is useless. Capability means technical experiences and learning.’

‘We learnt from benchmark firms and launched training programs for staff to enhance their knowledge and expertise. I like to practice, but without theories we shall be disoriented.’

‘Our company promotes cultivation of talents through innovation for corporate development vigour.’

‘We have the policy to recruit global talents and local employees in overseas projects, and we learn from benchmarking foreign firms.’ Case 1

Enhance learning

Our port business is developing rapidly, and our company will be soon ranked No.3 in terms of container throughput in the world.’ Case 1

‘We tried to understand the needs of our customers, adjust services and prices on a timely basis, compare the advantages and weaknesses over competitors, enhance service quality and customer satisfaction, and compete in services rather than in price.’ Case 3

‘Knowledge and prediction of our industry help us better understand the needs for incremental investments in terminals.’ Case 4

‘Cognition should be collectively recognised and adopted in the organisation. If we do

not have the cognition, we will not have any actions.’

‘Our successes were groped through practice by virtue of our franchise operation.’

Case 5

‘Our logistics industry needs professionals especially talents with experience of international freight forwarding. Our training centre aims to train technicians for Shenzhen logistics industry.’

‘We still have rooms to improve in order to catch up with or overpass world-class standard operation in terms of management efficiency, service ideology, and operating efficiency.’ Cases 6,7 & 8

Learning methods

‘We recruit talents for our domestic and overseas operations, and we set up benchmarks for training.’

‘Our staff training programs are mainly for job related skills.’

‘I prefer innovation, research, and the development of new things. Now I am working on developing a new type of navigation chart. Capabilities mean technical expertise and learning.’

‘We have the policy to recruit global talents and local employees in overseas projects and to learn from benchmarking foreign firms.’

‘I felt and recognised that staff with rich experiences and strong technological background helped build core competencies.’

‘We learnt from benchmark firms and launched training programs for staff to enhance their knowledge and expertise. I liked to practice, but without theories, we shall be disoriented.’ Case 1

‘My view is that learning means coordination and integration; we should follow our benchmarks for efficient utilisation of resources.’

‘The group provided internal training to staff to enhance their job related skills.’

Case 2

‘Our terminal businesses are subject to mechanical failure and goods damage, as certain machines and equipment may become obsolete. Therefore, we have

continuously undertaken four tasks: (1) to strengthen inspection and maintenance on equipment and machinery, (2) to improve employee's safety measures and prevention awareness and operating skills, (3) to enhance regular staff training and on-the-job training, and (4) to ensure operation in accordance with regulations.'

'Through establishing equity JV with a peer passenger ferry operator by expatriating our shipping management services, we learned operating models and management ideologies from them; therefore, we enhanced our management systems and management capabilities.' Case 3

'The concept of core competencies should have two layers: the essence and the appearance, because there is a correlation between these two. However, they are not equal. The issue here is the transformation method of essence to its appearance. For example, it is interesting that under what condition; inherent cognition will be transformed into extrinsic cognition.'

'Successes are derived from correct cognition; therefore, we need practice and action.'

Case 5

'One way of learning is to learn from partners. One of the leading ports in Shenzhen is keen to learn from its equity JV partner which is a global major port operator'.

'We must learn from our partners especially in management and operation because learning from our partners will enhance our operation for good results. We must catch up with and learn from advanced examples from the world; only in this way we can make progresses.'

'We still have rooms to improve and catch up with or overpass world class standard operation in terms of management efficiency, service ideology and operating efficiency.'

'Our logistics industry needs professionals especially talents with experience of international freight forwarding. Our training centre aims to train technicians for Shenzhen logistics industry.'

'As our businesses and assets grow, we need to change our minds and align with modern development situations. Business growth required us to change our thinking. Changes of assets require our mindset to catch up with such changes. We must learn in align with the changes in business and operation.'

'We have visited a lot of countries and saw what we needed to see. We replicated

what we had learned from counterparts in our daily operation and management, and we put what we had learned to practice.’

‘After 30 years’ of efforts and accumulation of technologies, funds, and talents; we became stronger and capable to operate modern ports through learning and practice.’

‘We learned from our partners in operation and management, and we also learned from them from legal perspectives. For example, when we negotiated new projects with local Governments, we had to be aware to avoid risk, e.g. local authorities may permit similar projects which may cause competition in the area.’

‘We launched Asia’s No.1 international logistics exhibition in Shenzhen to promoting the city, as a benchmark in logistics industry, to the world.’

‘We need to sum up our experiences, promote our advanced logistics management experience, set benchmarks in the world, and replicate our successful operating models.’

‘Our training programs include internal training, Government’s subsidized training, own expenses training, and Government supporting training.’

‘We invited qualified teachers and maintain close relationships with port operators for training practice.’

We insisted on inclusion of an exclusive clause in contracts for our port development projects to avoid the risk that local Governments may award permissions to late comers for similar projects in the region.’

‘The building of core competencies is a continuing process especially in the utilisation of resources; thereby, we can gain knowledge of effective utilisation of such resources.’ Cases 6.7& 8

Culture influence

‘I conducted an experiment once on board a ship, where our Chinese crew followed the western rules and styles, the task failed. However, when our people followed Chinese rules and styles; we succeeded. This is the evidence of culture differences.’
Case 1

Sustainable processes

Integration

‘We established equity JV shipping firms with cargo owners to maintain our close business relationships and to satisfy customers’ needs. We have more than a dozen firms of this kind.’

‘We promoted cooperation with other international ship-owners by equity joint venture or long term carriage contracts.’

‘Possessing technologies does not automatically mean competitiveness because it needs effective integration of other resources of the firm.’

‘For end C business, integration now means to rely on industry chain operation at home and abroad.’

‘Large scale reorganisation is not the ultimate goal, but it means deepening optimal relocation of resources. It aims to leverage synergy to achieve value creation.’

Case 1

‘The firm acquired new assets and integrated existing assets for container operation.’

‘The firm integrated internet technology to enhance the synergies derived from the collaboration between ports and logistics zones.’ Case 2

‘To meet the requirements of the business development, we upgraded our equipment and facilities. For example, we upgraded the X ray machines for airfreight logistics services in our warehouses.’

‘We were not doing well in integrating our resources before; where each business module operated and developed on its own. Now we have integrated our logistics resources into a logistics chain, and all functions can be linked together to improve operating efficiencies and performance results.’

‘To develop new business at our terminals and diversify the cargo portfolio, we took measures to optimise operation processes by accelerating the replacement of vessels and assisting building designated ports and wharves. In addition, we jointly develop “port-to-port” express settlement services with peer ports.’

‘We believe that being environmentally and socially responsible could enhance our performance and contribute to the overall sustainable development of the society.’

‘So far as SOE is concerned, the external integration of resources is not easy because each firm’s mission is fixed and not easy to be changed. However internal integration is more efficient.’ Case 3

‘One difficulty of the integration of resources is the culture integration. For example, SASAC may allocate one SOE with assets and staff together to another SOE; this kind of asset allocation may cause conflict of corporate cultures of these two firms. As a result, it is always not easy to integrate such differences.’

‘We deepened the integration of equity JVs and cooperative enterprises at the upstream and downstream of the industry chain to explore value added services.’

‘The objectives of our integration of resources are to build a full logistics chain and a port network as operating platforms.’

‘The motive of integration is to enhance our bargaining power, which is the reflection of synergy.’ Case 4

‘The firm expanded its business by integrating its core business with its auxiliary businesses to built the full industry chain and supply chain.’ Case 5

‘Port constructions were overlapped and their functions are similar; therefore, the plan of integration of port resources was being conducted to avoid cutthroat competition among peer operators.’

‘Now integration of ports in Guangdong is underway, but it is difficult because of the complex stakeholders and the involvement of various Government organizations.’

‘The purpose of the integration of port resources is to avoid competition among SOEs and to enhance competitiveness in global operations.’

‘The integration of port resources is a Government policy, and the plans of integration of ports were initiated by Governments in different places in China. Some integration projects were completed in the eastern part of China; and fewer progresses were made in Guangdong.’

Cases 6,7& 8

Coordination

‘We adhere to the market orientation ideology that customers are our centric business, and we should consummate our service systems and maintain close communication with customers to satisfy their needs.’

‘Once we become more competitive, we may control more ships rather than owing more ships. We can achieve this objective by leveraging our strong competitiveness in coordination.’

‘Coordination is the most effective way to leverage synergy and overall development.’

Case 1

‘The company collaborated with domestic and international ports by integration management of home-based ports and other ports zone for promoting barge networks and building feeder ports layout.’

‘The company optimised the Customs clearance process with the program of ‘Unification of Custom Zones’ in its home-base ports; hence it consolidated its market leading position.’ Case 2

‘As a major local shipping agent for river shipping firms from mainland, we have a strong capability to coordinate with ship-owners and with local Government organisations for presenting the interests of ship-owners.’

‘We adhered to the ideology that we are playing a team game, not an individual game; therefore, internal and external coordination are all important.’

‘In response to the market conditions and demands, the company took measures to coordinate various resources. Such measures included optimising ferry routes by increasing sailings, assisting ship owners to build in new ships, offering various fare packages to customers, and launching advertisements and promotions.’ Case 3

‘At different development stages, we took priority cooperation with different interested partners. For example, at the initial stage of our business in new ports, we mainly focused on close cooperation with shipping firms. When we became known to cargo owners; we cooperated with them to provide tailor-made logistics services.’

Case 4

‘Our core businesses are port construction, operation, and management, and we are doing very well in coordination of investment and construction of ports.’

‘Our equity JV with a world-class port operator enables us to better leverage synergy of our domestic port resources and to capitalize on overseas development opportunities.’

‘We work closely with international major shipping lines through our JV partners, and we become an important part of their global operations. Case 5

‘A single port functions like a workshop, and its operation directives are from the operational control centres.’ Cases 6,7 & 8

Cooperation

‘No firm can dominate the whole market because the market is too large. The market needs harmonised cooperation between market players.’

‘We cooperate with peer operators to connect different sections of carriage for transportation of ores.’

‘We promote and deepen cooperation with ports and shipping firms to build the logistics ecosystem for shipping and port industries.’

‘We shall strengthen our global development relationships with interest related partners and share knowledge, expertise, technologies, and financial support with them, especially partners in developing countries.’

‘Peer cooperation helps achieve mutual benefits in terms of optimal relocation of resources and converging industry intensity.’ Case 1

‘Our investment decisions are related to our core business, and such decisions are based on our acute judgment of the market conditions.’

‘The firm established a strategic cooperation with a major international shipping line to explore development opportunities along “Belt and Road” countries.’ Case 2

‘We established a peer partnership with a key port operator in Shenzhen and set up a strategic alliance to provide shuttle cargo services to the key terminal for exportation. This partnership operation can leverage our operation platforms and became one of our revenue resources.’

‘We established partnership with Customs clearance agencies to facilitate Customs declaration process, and we set equity JVs with partners in terminal operations’.

‘Our ports exerted efforts to explore business from various major electric home appliance manufacturers and to attract domestic cargo sources. In addition, we enhanced cooperation with major shipping liners and freight forwarding companies.’

‘We cooperate with a key port operator in Shenzhen to provide the ‘South China Express Line’ containers services in the Pearl River Delta area in Guangdong, China.’

Case 3

‘We enhanced cooperation with interests related parties including railway companies and shipping firms for joint marketing.’

‘We persisted in innovation of business models, and we open new routes to destinations of the eastern ports of US and ports in northern Europe. We expanded new overseas logistics services in Vietnam and Cambodia. We also explored new shuttle services routes and business for sea-rail linked trains.’

‘We adopted a flexible pricing policy. For example, we fixed our prices at the bottom line to attract customers when our new port commenced business. When our customers became stable, and our services are improved to meet customers’ new demand; we may adjust our pricing policy accordingly.’

‘One of our main tasks is our leverage function as a hub port in southern China.’

Case 4

‘The company invested and constructed three ports through cooperation with local firms in other places in southern and northern parts of China since 2013.’

Case 5

Transformation and innovation

‘Digital transformation means the utilisation of advanced digital technologies to change the traditional business models. We are building our shipping industry into a new logistics ecosystem to elevate our operating efficiency and to maximise our operating results.’

‘Our company is now developing a logistics ecosystem with a digitalised platform to attract best shipping firms and port operators.’

‘The challenges in our business include changes of customers’ demands, changes of production modes, and the new internet technologies; therefore, we need to upgrade our traditional shipping services and enhance capabilities to develop comprehensive measures to cope with such challenges. Moreover, we need to enhance our competitiveness by continuing innovation for new business models and the cross industry business.’

‘Our digital transformation involves in intelligent shipping, intelligent port operation, and intelligent business models.’ Case 1

‘We are now moving for intelligent transformation by utilising high-end technologies in our operations that helps provide stable services to our customers, and we are constructing intelligent ports.’

‘The firm facilitated the home-based port development projects by upgrading its port zone to capitalise on the opportunities arising from the local Free Trade Zone development.’

‘The firm is now transforming one of its general cargo terminals into an automatic, intelligent, and low carbon container terminal.’

‘The issue of intelligent port operation has been raised for many years; it is an inevitable development trend in port industry.’

‘The firm achieved synergy by exploiting their existing port network for enhancing value creation for customers.’ Case 2

‘Intelligentization is the driver to elevate operation efficiency and reduce operating costs. We promoted our intelligent port services by the innovated integration of informationalization with traditional business based on customers’ demand.’

We expedited our building of information systems including intelligent port dispatching, intelligent cargo tally, intelligent shipping, intelligent towing services, and the platform of the port and Customs clearance.’ Case 4

‘Shenzhen will have the first automatic port which includes berths No.1 to berth No.4 in 2021.’

‘The application of block chain technologies will enhance our information services, and credential security; therefore, it helps enhance our core competencies.

Cases 6,7 & 8

Optimal resources amassment

Purpose

‘Our operating assets must be able to satisfy customers’ values before we can think about how to allocate our resources.’

‘Acquiring advanced and bigger ships means low cost and high loading capacity; therefore, it means we are more competitive.’

‘New ships mean production efficiency and more competitiveness.’

‘The purpose of acquiring operating assets or building new ships is to enhance our

core competencies.’ Case 1

‘VRIN assets are the basis of our core competencies.’

‘The purpose of maintaining a reasonable size of resources is to provide better services to customers in alignment with the increase of cargo volume.’ Case 4

Criteria

‘The selection criteria of resources are the production efficiency of such resources. For example, new ships mean competitive edge in competition.’

‘We should configure our shipping assets and resources to satisfy our customers’ needs and their values.’ Case 1

‘We are doing very well in marketing, and our efforts are market oriented.’

‘Our development depends on our market share, business momentum, and the resources available.’

‘Our port development pace depends on our assessment of the market conditions, and our entry point to incremental terminal expansion is market oriented.’ Case 2

‘Our criteria for acquiring assets are that it should be related to core business and that it should satisfy the performance requirements of the SASAC in terms of ROI and ROE.’

‘We configure our asset base for three purposes: (1) to acquire operating assets for new investment or new business, (2) to replace obsolescent assets, and (3) to upgrade assets for industry safety and for environmental protection requirements.’

‘Owning only one individual terminal does not cause linked effect in operation; hence, we need to possess VRIN assets and a pool of port resources to create linked effect in our operation.’ Case 3

‘The location of a port is critical to our investment, and it is subject to the local industry development. Even a port dominates a prime geographical location with a deep water harbour, still it may not be able to survive; if there is no industry production that generates cargos for the port in the area.’

‘Our main assets dominated a superior geographical location in the juncture of the river network and deep water ports. Our ports connected with national rail systems,

express highways, air freight, and river trade systems, capable to provide river-sea, and sea-rail linked transportation.’

‘We viewed that possessing core rare resources are the basis for building our core competencies because core resources guarantee bargaining power and marketing position.’ Case 4

Typology

‘For tangible resources, the main types of operating assets include terminals, ships, shipyards, cargo handling equipment, facilities of industry chain and supply chains.’

‘Our industry chain includes seven industry clusters: shipping, shipping finance, logistics, equipment manufacturing, shipping services, socialized industry, and ‘Internet +’ related business. Based this industry chain, different shipping factors were harmoniously integrated.’

‘We have built a global layout of ports and shipping routes with 51 ports in the world. This ‘Route-Port’ layout serves as our industry chain.’

‘Our firm is now building a major digitalised platform which can access all detailed information about the activities of operation and management of the firm.’ Case 1

‘Our assets are VRIN assets such as our cargo ports and passenger ferry ports (which were situated at the prime geographic locations) and the franchises for cross-border passenger ferry operation.’

‘The types of our operating resources include ships, terminals, cargo handling equipment, logistics warehouse, and auxiliary plant and machineries.’

‘Our operating resources include passenger services, port logistics, auxiliary business, expressways, industry chain, and supply chain.’

‘The analysis of a desirable portfolio of tangible and intangible assets of a firm should not be a quantitative issue; rather, it should be a qualitative judgment. However, if we use quantitative approach to address this issue; we should compare the results with the industry average benchmarks.’

‘Our resources include terminals, warehouse, fleet, and operating and information systems for passenger services, logistics, terminal operation, and warehouses operation.’

‘We have retained a labour force of capable technical, operational, and management professionals including ship engineers, captains, electric technicians, and terminal construction engineers. All these are valuable resources of our firm; accordingly, we

have established sound human resources management systems.’

‘In regard to our human resources management, we pursue the principles of equality, voluntariness, and consensus. Specifically, we abide by the people-oriented principle to provide employment opportunities, remuneration, training, performance assessment, promotion, and other employee benefits.’

‘The type of our operating resources includes ships, terminals, logistics warehouse, and auxiliary plant and machineries.’ Case 3

‘Our assets are mainly VRIN tangible assets because such tangible assets can satisfy customer’s needs.’ Case 4

‘There are different professional ports in Shenzhen serving different customers in different industries such as container, LNG, and bulk cargos.’

‘A port is an integrated transportation hub for exchanging mode of transportation, and a centre of logistics information and services.’

‘A port as a shipping centre relates to different industries: rail way, road transport, sea transport, and airfreight. It provides a variety of logistics services including transportation, distribution, allocation, and consolidation, and it connects directly to global logistics activities.’

Case 6,7 & 8

Configuration

‘We are in the process of transformation by integrating firm resources both at home and abroad to expand our operations from end-to-end of the supply chain.’

‘We established equity joint ventures with mine owners, port operators, ship-owners, and secured strong Government support; therefore, we can maintain a competitive advantage over others.’

‘Building intelligent ports and acquiring new ships means more competitive advantage.’

‘As far as our company is concerned, our ways to build assets and resources are (1) to consummate a full industry chain and (2) to build advanced ships at our own shipyards. These are the physical conditions to support our core competencies.’

‘Our strategy to build our resources base is to expand our industry chain to consummate our business structure and the layout of resources.’

‘We focus on building a global operating network in new emerging market countries to enhance our operation capabilities in global ports, shipping routes, and services. We increased overseas investments in ports, warehouses, storage yards, and distribution centres to build a sound and comprehensive global logistics network.’

‘We have acquired a major port in Europe, which was the first major overseas acquisition after the reorganisation of our company. This project is a new milestone in our overseas investment and operation.’

‘We have built an integrated industry chain with related production factors servicing global customers.’

‘We promoted cooperation with other international ship-owners in terms of equity joint ventures or long term carriage contracts.’

‘We established equity joint venture shipping firms with cargo owners; hence, we can maintain our close business relationships to satisfy customers’ needs. We have more than a dozen of this kind of firms.’

‘We adhere to the operating ideology of market orientation, customers as the centric business, consummation of service system, and the close communication with customers to satisfy their needs.’

‘No firm can dominate the whole market because it is too large. The market needs cooperation between market players.’

‘Digitalised transformation means the utilisation of advanced digital technologies to change the traditional business models. We are building our shipping industry chain into a new ecosystem to elevate our operating efficiency and maximise our operating results.’ Case 1

‘The firm is launching a project to build a smart port ecosystem to improve operating efficiency of assets and to promote business innovation for home-based port operation.’

‘The company focused on hub port construction, investment in bonded logistics operation, port-related manufacturing operation, and layout of ports to attract foreign investments.’

‘The firm is conducting transformation plans to upgrade traditional terminals into modern container terminals with automatic, intelligent, and green operating environment.’ ‘The firm will also build a smart port ecosystem for home-based port operations.’ Case 2

‘Our methods to configure our resource base include exchanging equity shares, acquisition of assets, and disposal of obsolete assets.’

‘Assets configuration is strategy oriented, and the utilisation of assets should support strategies.’

‘Our principle is to configure resources, and these resources must be supportive to our strategies. For example, our investment projects must be strategic resources.’

‘We upgraded our X-ray equipment to conduct inspection services for airfreight cargo in Hong Kong.’

‘We completed a transformation project of a temporary site by utilising smart terminal equipment in conjunction with the container yard location system, which greatly improved the efficiency of container settlement.’

‘The company has built up port networks for cargo port operations and passenger ferry operations.’

‘Our asset configuration activities include internal building of assets, admitting and utilizing assets allocated by Government from other SOEs. Specifically, we upgraded existing assets, built smart port operations, renewed ships, built operation platforms, improved property’s equipment, maintained equipment, enhanced functions of assets, and consummate logistics networks. In addition, we consolidated industry chain and supply chain. Further, we adjusted the layout of port assets, revitalise assets, and swap quality assets.’

‘Our resources configuration also includes overseas business expansion. For example, we have expanded our logistics networks in Vietnam, the Philippines, Thailand, and Singapore; hence, our overseas logistics chain was consummated.’

‘We abide by people-oriented principle to provide employment opportunities, remuneration, training, performance assessment, promotion, and other employee benefits.’

‘We have retained a labour force of capable technical, operational, and management professionals including ship engineers, captains, and terminal construction engineers. All these are valuable resources of our firm; accordingly, we have established sound human resources management systems.’ Case 3

‘Our aim is to build our port into an international shipping hub in southern China.’

‘The principle of assets configuration is to allocate assets accordingly to the operating

conditions which are based on predictions of our business growth.’

‘We expedited our construction of key projects including container terminal, vehicle terminal, grain terminal, general terminal, grain warehouse, and the international logistics centres.’

‘The methods to configure our asset base include outsourcing, using free-hold or leased-hold assets, admitting assets allocated by Government from other parties, improving functions of assets, and disposing non-performing assets.’

‘The motive of integration is to enhance our bargaining power, which is the reflection of synergy.’

‘We deepened the integration of equity JVs and the cooperation among enterprises at the upstream and downstream of the industry chain to explore value added services.’

‘We expedited our building of information systems including intelligent port dispatching, intelligent tally, intelligent shipping, intelligent towing services, and the platform of the port and Customs clearance.’

‘We persisted in innovation of business models. We open new routes to destinations of the eastern ports of US and ports in northern Europe. We expanded new overseas services in Vietnam, and Cambodia. In addition, we explored new shuttle services routes and services for sea-rail linked trains.’

‘We continue to upgrade our operating assets by expanding terminal spaces, constructing logistics centres, and building automatic container yards.’ Case 4

‘We adopted a plan to consummate functions of new invested ports (i.e., make full use of favourable local conditions to supplement other ports within the company) to elevate our competitiveness.’

‘Our methods to build resources base are integration of regional port resources, coordinated development of regional ports, and optimising port functions and business structures.’

‘The firm is launching a project to build a smart port ecosystem to improve operating efficiency of assets and to promote business innovation of home-based ports.’

‘When we consider an investment project, we need to consider the correlation effect of this project with the existing projects in order to see if we have the synergy.’ Case 5

‘The port industry in Shenzhen consists of SOEs and foreign equity JVs located on

the eastern and western parts of Shenzhen, and the local terminals include container, petroleum, and chemical terminals.’ In the last few years, integration of ports in Shenzhen had been taken place.

‘There was a Government plan to integrate all ports in Shenzhen, but such a plan failed because of the complexity of share structure of firms. However, the integration plan for SOEs was a success. The total container throughput of containers in Shenzhen ports ranked No.4 in the world in 2019.’

‘A full scale of application of advanced technologies is underway in Shenzhen including 5G, AI, VR, AR, internet, internet of things, and big data.’

‘In alignment with Government’s policy of the “Greater Bay Area” development, the local Government is now launching the plan to build two international hub ports in Guangdong, one in Shenzhen and the other in Guangzhou. Hong Kong will remain as the international shipping centre.’

‘A single port functions like a workshop, and its operation is subject to directives from the operation control centre.’

‘The plans of integration of ports were initiated by Governments in different places in China. It is a Government policy. The integration in some places in the eastern part of China was completed, and fewer progresses were made in Guangdong.’ Cases 6,7 & 8

Construction window

‘Our port development pace depends on our assessment on the market conditions, and our entry point to incremental terminal expansion is market oriented.’

‘Our investment decisions are related to our core business, and such decisions are based on our acute judgment of the market conditions.’ Case 2

‘The adjustment of our asset portfolio in terms of proper timing for construction of terminals or increase of handling equipment should depend on our development plan and strategic persistence.’

‘We allocate our resources to match the operating conditions in terms of volume of cargo and the frequency of shipping schedules.’

‘The company focused on hub port construction, investment in bonded logistics operation, port-related manufacturing business, and attracting foreign investments.’

Case 4

‘We installed cargo handling equipment in advance and increased such equipment in line with the incremental momentum of the business.’ Case 5

Core competencies

Embodiments

‘We have a professional management advantage in terms of fleet management, crew, operation, skills, and shipping safety management.’

‘A digitalised business platform is a reflection of core competencies.’

‘A full industry chain is a way to reflect firm’s core competencies.’

‘Transformation of business models and iteration of cargo ships are the incarnate expression of our core competencies.’

‘Our core competencies were reflected in our full industry chain and supply chain, whereby we can provide integrated logistics services to customers from cargo sources, transportation, and delivery.’

‘Our core competencies were also reflected on the intelligent operation such as intelligent port operations and green shipping practices.’

‘Our core competencies were reflected on the capability to renew ships.’

‘We have the financial and operational capabilities to acquire foreign port assets.’

Case 1

‘Our competencies and successes lie in our marketing activities, and our management team is doing very well in marketing.’

‘The advantage of our port is the geographic location which is rare and not replicable. We can leverage such an advantage to access vast cargo bases.’

‘We used the coastal line to build the port with the permission from the Government. The coastal line is the rare nature resource, and the port is the basis for our core competencies.’

‘We achieved synergy by exploiting our existing port network for enhancing value creation for customers.’

‘Our core competencies mean that we are capable to consummate our port portfolio worldwide.’

‘One of our key resources is our capability to access the vast cargo bases that support our business.’ Case 2

‘Our competitivenesses are derived from our full layout of tangible assets.’

‘Our core competencies mean unique and sustainable operating capabilities in various areas including utilisation of assets, employment of talents, application of skills, and operation and management routines.’

‘Our core competencies mean our knowledge to identify and acquire the core and proper investment projects. For example, we acquired a unique piece of land which is valuable for undertaking airfreight business because it is adjoining the Hong Kong Airport across the Hong Kong harbour. In addition, our river terminals are located in key areas with access to cargo bases in PRD.’

‘Our corporate brand is our core competence in marketing.’

‘Our unique competitive advantages were reflected in our best resource; which is our capable management team equipped with overseas and domestic operating and management experiences and skills in logistics, brand operation, and assets reconfiguration.’

‘Our core competencies were reflected on our marketing network, operation network, port network, cooperation with ocean shipping lines, and the amassment of customers.’

‘Our core competencies were reflected in efficient communication with Government organisations in terms of representing interests of our customers (Mainland shipping companies).’

‘Core competencies mean a kind of capability that competitors or peers could never reach. It means possessing VRIN assets and accumulation of management capabilities.’

‘In my view, core competencies are derived from assets that generate competitiveness. Such competitivenesses are the products of the commitments of the investment decision makers.’

‘I have the view that the characteristics of the management team, not just the individual’s characters, may affect the results of the corporate decision making. The style of the management team (formed by culture) and its characteristics will be either conservative or aggressive, and such style will determine their decision preferences.’

Case 3

‘Our ultimate customers are cargo owners we serve; while shipping firms are the

carriers of the value of services we delivered.'

'Our core competencies are reflected on services to diverse customers and our business formats such as different types of charter of ships (e.g., time charter or voyage charter). We are not just serving shipping firms.'

'Core competencies are reflected in services we provide; this is my persistent view of core competencies.'

'Our core competencies were reflected on our service quality and cargo handling efficiency.'

'Our core competencies were also reflected on our logistics facilities because such facilities can satisfy the requirements of our customers.'

'VRIN assets are carriers of core competencies because they can deliver required services. For example, if you have appropriate warehouses for storing grains; then, you have the competitive advantage over your competitors.'

'Our core competencies are demonstrated in six aspects. They are the advantageous geographical locations of ports, vast cargo hinterland, enhanced functions of hub port, superior business environment, integrated operation platform, and efficient operation and management.'

'Core competencies are reflected in services we provided; this is my persistent view of core competencies.' Case 4

'Our core competencies were reflected in our franchise operation because our franchise awarded by the Government guaranteed our opportunity to run the business. Franchise is the policy resources.'

'Ours is a large deep water port capable to accommodate mega-vessel operations, and our container throughput was ranked top one in the world in terms of a single port area. Our core competencies were reflected on our prime natural conditions of ports, the access to the most developed economic hinterland of cargo, the advanced and efficient operation and management, and our brand advantage.' Case 5

'The critical factors for port industry are the management efficiency, management effectiveness, and operating efficiency; hence, we need talents to achieve these goals. Core competencies were reflected in operating efficiency, management efficiency, and cost effectiveness.'

'Core competencies were reflected in scale of operation and consummate functions of

port.'

'Core competencies should be reflected in on-line business of port industry.'

'Core competencies should be reflected in high end port services including legal and insurance.'

'A port has three main functions: as a conversion centre of transportation modes, as the information centre, and as the services centre. For these functions core competencies shall be built, and these functions should satisfy the needs of customers in terms of smoothness, hub port services, and conversions of transportation modes.'

'Ports should have the capability to provide modern information services for business transactions, e.g. on-line booking, freight settlement, and arrangement of transportation services.'

'The core competencies of Case 5 were reflected on its close cooperation with its partners in global operation.'

'Core competencies of a firm are reflected in the management team in terms of knowledge, ideology, and talents.' Cases 6,7 and 8

Building path

'We are now building a digitalised business platform called logistic ecosystem wherein more than 170 firms will participate. On the platform, all data are traceable, and reports of movement of cargoes are available. This platform is digitalised with a collection of a large quantity of data that are processed by algorithms as an optimal business solution. This is the main path that we used to build our core competencies.'

'Keep learning is a way to enhance core competencies.'

'To cope with current competition, we are now launching the program to build our competencies through digitalised transformation in operation and management.'

'Our process to build core competencies is to build a digitalised business platform.'

'Our process to build core competencies is to build a full industry chain and supply chain.'

'Expansion by M & A is a way to gain competencies.'

'The approach to build core competencies is to integrate firm's global logistics chain and to exploit synergy of such resources.'

'The firm conducted assessments and studies on the macro-economy and the industry, and it formulated implementation plans to convert internal capabilities and resources into competitive edges.'

‘One path to build core competencies is to build a comprehensive port ecosystem for synergy.’ Case 1

‘Our overseas port investment projects constitute an important part of our port network.’ Case 2

‘Our core competencies are gained by acquisition of desired assets, integration and transformation of business at the right time, and our commitment to the strategic development direction.’

‘We build our core competencies mainly by adjusting our operation models and transforming business.’

‘To build our core competencies, we built up our marketing network, accumulate customers, and cooperate with ocean shipping firms.’ Case 3

‘We viewed that possessing core rare resources are the basis for building our core competencies because core resources guarantee bargaining power and marketing positions.’

‘To build our core competencies, we leveraged our advantages with functions as a hub port; and we transformed from a traditional logistics services company into a modern logistics enterprise to become the ‘big port, big logistics, and big economy.’

‘Our methods to build core competencies include optimising the layout of ports, developing green and safe ports, participating in overseas cooperation, enhancing our services quality and operation efficiency, building intelligent ports, and speeding up infrastructure construction of ports.’ Case 4

‘We built our core competencies by coordinating business with railway transportation and increasing terminal handling capacity, e.g., we consummate the layout of ports by conducting new investment of ports. We also built a full industry chain including warehousing and auxiliary services, i.e., shipping agents, freight forwarding, Customs clearance, and land transportation.’

‘We maintain our trustworthy brand by providing efficient terminal operation.’

‘We acquire VRIN assets and build green ports.’ Case 5

‘One way to build core competencies is to have good equity JV partners. One of the leading port operators in Shenzhen had a good equity partner, and the firm has been operating very successful.’ Cases 6, 7 and 8

Typology

‘I have the view that core competencies can be divided into four types: the resources-based core competencies, the operational-based type, the management-based type, and the intellectual-based type. The core competencies our company possesses now belong to resources-based type, which means that our competencies are derived from the services of our resources. I hope some day ours will become a management-based type.’ Case 3

Relationship

‘Tangible assets and the building of core competencies are complementary and reinforcing each other because tangible assets help to cultivate and reinforce core competencies. On the other hand, core competencies facilitate investments in tangible assets. It is a positive cycle relation.’

‘I have the view that the characteristics of the management team, not just the individual’s characters, may affect the results of the corporate decision making. The style of the management team (formed by corporate culture) and the characteristics of the team will be either conservative or aggressive, and such style will determine team’s decision preferences.’

‘Our core competencies are derived from our unique tangible assets, i.e., cargo and ferry ports, and other resources such as passenger ferry operating qualification, and shipping safety management qualifications. There would be no core competencies and business if we have no such unique assets.’ Case 3

Development phase

‘The application of the resources-based core competencies and the management-based core competencies depends on the phase of the development of a firm. For resources-based type of core competencies, my understanding is that the change of the management may not affect significantly the operation and the management of the firm because the competencies are determined by resources and the fixed models of operation. For management-based type of core competencies, the competencies are more reflected on the managerial flexibility in response to market changes; and such competencies are straining capability.’ Case 3

‘I have the view that core competencies possessed by a firm are different at different

stage of the development of the firm, and they can be classified into different levels. Obviously, core competencies incarnate at different stage of the business cycle.' Case 5

(Source: Annual reports and transcripts of all Case)