INSTITUTO
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The Role of Dynamic Capabilities in Strategy Development: The Case of Arthritis Specialized Hospitals in China

XIAO Lianbo

Doctor of Management

Supervisors:
PhD Nelson Santos António, Professor,
ISCTE University Institute of Lisbon
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BUSINESS
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Abstract

Arthritis has become one of the significant public health threats to humans. The availability of hospitals specialized in arthritis does not meet the growing demands for treating arthritis. The “dynamic capabilities”, i.e., the ability to organize and manage resources to gain a competitive advantage, are fundamental to addressing this problem. Therefore, this thesis proposed a strategic development model for arthritis-specialized hospitals emphasizing dynamic capabilities.

In this study, we interviewed the management leaders from ten hospitals, where we collected the data. We used qualitative research software NVivo 12 Plus to summarize and analyze the data using a three-level coding approach based on the Grounded Theory. We concluded that the dynamic ability to address adequate needs for arthritis is mainly composed of regular assessment of changes in patient needs, timely interpretation of current national policy on health care, and analysis of regional competitors in joint diseases. Organizational learning ability comprises business learning, advanced training at home and abroad, and standardized training for young physicians. Administrative reform and innovative abilities mainly consist of orthopedic and joint sub-specialty subdivisions and integration, cultivating a cultural atmosphere for innovation and transformation to build strategic alliances. Organizational flexibility consists of adjusting the hospital structure and system promptly, mobilizing employees’ initiatives, and so forth. Building strategic barriers are composed of promoting the protection of intellectual property rights and preventing the loss of core employees. Cultivating dynamic capabilities is the key to arthritis-specialized hospitals gaining a competitive advantage. These research results provide a basis for formulating the development strategy of China’s arthritis-specialized hospitals and have essential value for generalization.

Keywords: dynamic capabilities; public hospitals; arthritis-specialized hospitals; strategic management

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Resumo

A artrite é uma das maiores ameaças para a saúde humana. A oferta dos hospitais de artrite não é suficiente para satisfazer as crescentes exigências e as capacidades dinâmicas constituem uma garantia fundamental para enfrentar este problema. Este estudo propõe um modelo de estratégia de desenvolvimento para hospitais de artrite baseado nas capacidades dinâmicas.

Para a recolha de dados utilizamos o método de estudo de caso entrevistando gestores de dez hospitais. Para tratar os dados utilizamos o software de pesquisa qualitativa NVivo 12, e para percebermos as interligações recorremos à abordagem de codificação em três níveis da Grounded Theory. Este estudo concluiu que: (i) a capacidade de percepção ambiental das capacidades dinâmicas consiste principalmente na avaliação das mudanças das necessidades dos pacientes, na compreensão atempada da orientação da política médica nacional, e na análise dos concorrentes regionais; (ii) a capacidade de aprendizagem organizacional consiste principalmente na aprendizagem dos negócios médicos, no acesso a estudos mais aprofundados realizados no país e no estrangeiro, e na formação padronizada de jovens residentes; (iii) mudança organizacional e capacidade de inovação consistem principalmente na segmentação e integração de subespecialidades ortopédicas, no cultivo de uma cultura de inovação e mudança, e estabelecimento de alianças estratégicas; (iv) flexibilidade organizacional consiste principalmente no ajustamento oportuno da estrutura e sistema hospitalar e mobilização da iniciativa do pessoal; (v) a capacidade de construção de barreiras estratégicas consiste essencialmente na promoção da proteção da propriedade intelectual e na prevenção da rotatividade dos principais talentos. Em suma, a construção de capacidades dinâmicas é a chave para alcançar uma vantagem competitiva para os hospitais de artrite. Os resultados da investigação fornecem também uma base para os hospitais de artrite na China formularem estratégias de desenvolvimento, e servem simultaneamente de referência para o estabelecimento de um sistema de índices de avaliação científica, que tem um significado prático importante.

Palavras-chave: capacidades dinâmicas; hospitais públicos; hospitais de artrite; gestão estratégica

JEL: I18; L1

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摘 要

关节病已经成为威胁人类健康的主要病种。关节病医院供给满足不了日益增长的关节病就医需求。动态能力是关节病专科医院满足需求的根本保证，论文提出了在动态能力理论指导下的关节病专科医院发展战略模型。

本研究采用案例研究方法，访谈了 10 家医院的管理层人员，使用 NVivo 12 Plus 质性研究软件，基于扎根理论，使用三级编码进行节点归纳和分析。结论认为关节病医院动态能力的环境感知主要由定期评估患者需求的变化、及时掌握国家政策导向、分析关节病医院区域竞争者等组成；组织学习能力由业务学习、国内外进修和青年医师的规范化培训等组成；变革创新能力主要由骨关节亚专科细分和整合、培养创新变革的文化氛围、构建战略联盟等组成；组织柔性能力由适时调整医院结构和制度、调动员工的主观能动性等组成；构建战略壁垒能力由促进知识产权保护、预防核心员工的流失等组成。培育动态能力是关节病专科医院取得竞争优势的关键。研究成果为中国关节病专科医院的发展战略制定提供了依据，具有较重要的应用价值。

关键词：动态能力；公立医院；关节病医院；战略管理

JEL 分类号：I18；L1

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Acknowledgement

For the first time in the past thirty years, I temperately stopped my beloved career as a surgeon, handed over some of the administrative responsibilities to my colleagues, and devoted the time to pursue a doctoral degree in business management. I was both excited but also hesitated when I made this decision. Born in 1967, I am currently 55 years of age. I was promoted to a master's supervisor 16 years ago and became a Ph.D. doctoral and postdoctoral supervisor for five years. For the past five years, I often wondered: "Do I need such a doctorate in management"? I have followed the strict requirements of Professor Nelson, completed the course study, thesis topic selection, literature review, research interviews, theoretical framework, and data collation, and completed all the requirements from both the University of Lisbon in Portugal as well as the Southern Medical University for a doctorate, and last but not least, wrote the thesis in both Chinese and English. During this period, there were endless challenges but accomplishments simultaneously. When I finally finished the last chapter of my doctoral dissertation, a well-known poem best described my enlightenment. "I have been searching for her thousands of times amidst the crowd, almost losing myself during this effort, but I refused to give up. When I turned around, she was right there, amid the sparkling light". Those who have endured so much to advance their career goals in ancient and modern times might have feelings similar to what I have right now.

I extend my heartfelt gratitude to Professor Nelson António for his one-on-one instructions in ISCTE-IUL, Southern Medical University, and Shanghai Guanghua Hospital. Whenever I sent him my newly-written chapters, he reviewed and revised them and returned them to me promptly. He gave me excellent guidance and assistance, taught me to use a more comprehensive and in-depth understanding of management theories, and broadened my international horizon. I have benefited a lot and will forever hold gratitude toward him.

I would also like to thank Professor Virginia Trigo, Professor JIANG Hong, Professor WANG Dong, and Ms. OU Weiyan for giving me considerable pertinent advice while writing my dissertation and suggesting future directions for research. My severe gratitude for Professor Wei Yao from the University of California, Davis, for her help in polishing the English version of the thesis.

My thanks also go to my graduate students, Dr. ZHONG Sheng and Dr. RAN Lei, and my clinical assistant, Master XU Xirui, for their continuous assistance and encouragement throughout the study and writing the dissertation. Without them, I might have given up on the dissertation.

I want to thank the directors, deputy directors, department heads, discipline leaders, and senior professors of hospitals specializing in arthritis and the department of osteoarthritis in general hospitals, whom I had in-depth interviews with them for one to two hours each. Their visions and wisdom were the greatest highlights of this study. Thanks to all the focused group members, their suggestions strengthened my confidence in the study results, which would apply to the Shanghai Guanghua Hospital.

I thank teachers Jia Lanlan and Zhang Difei for their translations. In the past five years, I have bound with them in turns of work, life, or study. Huang Min, Zhao Yanjun, Li Qiang, Li Ting, Sun Yingli, Wan Mianshui, Liu Linxia, and other doctoral students- we encouraged and supported each other and worked together to sprint toward the final stage of the dissertation.

Finally, I would like to thank my family, my wife, and my son. After three years of intense anti-epidemic work, I was physically and mentally exhausted. My family supported me in moving forward and encouraged me to fulfill my dreams and goals. My most severe thanks to my beloved family members!

Studying for a Ph.D. and writing a dissertation could be excruciating and challenging. I believe that as long as I persist in making unremitting efforts to perfect myself, I will continue to surpass myself and achieve the goal of a doctorate, the highest “crown” in academic education, and proudly put on my Ph.D. gown!

致 谢

三十年来当我第一次这么长时间停下自己心爱的手术，把医院管理的部分职能交给我的同事，静下心来完成我的博士论文的时候，我是如此心潮澎湃、感慨万千。作为一个 1967 年出生，已经年届 55 岁，16 年前已经升为硕士生导师，5 年前又成为了博士生导师和博士后合作导师的我来说，我是否需要这么一个博士学位？当我按照 Nelson 教授的严格要求，遵循葡萄牙里斯本大学学院和南方医科大学博士学位的所有规程，完成课程学习、论文选题、文献综述、研究访谈、理论框架、资料整理、论文中英文书写的时候，我最大的体会是，对自我的挑战和提高是永无止境的，是永远值得追求的。当我完成博士论文最后一章的时候，“众里寻他千百度，蓦然回首，那人却在，灯火阑珊处”这首词很好的表达了我现在的心情。古今之成大事业、大学问者应该有这样的境界。

我要感谢 Nelson António 教授，在葡萄牙里斯本大学学院，在广州南方医科大学，在上海市光华中西医结合医院，多次面对面的指导。使我获益匪浅，终身难忘。特别是 Nelson 教授，我每次把一章又一章发给他的时候，他总是仔细修改，然后发回给我。严格把关、精益求精，给予了我耐心的指导和帮助，使我对管理理论有了更全面、更深层次的理解，开拓了国际视野。

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我要感谢接受我访谈的全国关节病专科医院和综合医院骨关节病专科的院长、副院长、科室主任、学科带头人、资深教授，每人长达 1-2 小时的深度交谈，他们的远见和睿智是这篇论文最大的亮点。感谢焦点访谈小组的所有成员，他们的观点让我对该研究成果在上海市光华中西医结合医院落地充满了信心。

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最后我想我要感谢我的家人，感谢我的夫人和我的儿子，三年繁忙的抗疫工作，身心俱疲，家人无私的支持我向前走，鼓励我去完成自己心中的梦想和理想，谢谢我的家人。

博士求学和论文的写作过程异常痛苦和艰辛，但我相信只要坚持自强不息的理想信念，不断攀登，一定会不断超越自己，实现学历教育中最高“皇冠”博士学位的人生目标，穿上自己的博士服。

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Chapter 1: Introduction

1.1 Background

Arthritis has become one of the significant threats to human health and has severely endangered social and economic development. With the aging of the Chinese people, the prevalence and incidence of arthritis are also increasing. Arthritis refers to diseases that affect the joints and surrounding tissues of the human body. There are more than a dozen classifications of hundreds of diseases with various symptoms. According to modern medicine, arthritis includes osteoarthritis, gouty arthritis, osteoporosis, ankylosing spondylitis (AS), and rheumatoid arthritis. In traditional Chinese medicine, it is generally known as a chronic bone disease belonging to the categories of "atrophic debility of bones," "rheumatism," "avascular necrosis," and "low back pain." The clinical manifestations of arthritis include redness, swelling, heat, pain, dysfunction, and deformity of joints, which can lead to physical disability and affect the quality of life of patients in severe cases.

The number of patients with various categories of arthritis in China is conservatively estimated to be over 300 million, and the figure is on the rise with the aging population. Take osteoarthritis (OA) as an example. OA is prevalent in middle-aged and elderly folks with a high incidence. For people over 65 years old in China, more than 50% of them have OA. The sites involved include the knee, hip, ankle, elbow, hand, and spine (cervical vertebra and lumbar vertebra). The China Health and Retirement Longitudinal Study (CHARLS) results show that the prevalence of OA in China is 8.1%, with more female patients than male patients. There are significant geographical differences, namely, prevalence is relatively high in southwestern China (13.7%) and northwestern China (10.8%) and relatively low in northern China (5.4%) and the eastern coastal region (5.5%). In terms of regional distribution, the prevalence of OA is higher in rural areas than that in urban areas (The Joint Surgery Branch of the Chinese Orthopaedic Association, 2018).

1.1.1 Development trend of arthritis hospitals in China

In a broad sense, arthritis covers all the diseases in orthopedics, rheumatology, and rehabilitation. There have been many multidisciplinary medical groups, such as the Hospital

for Special Surgery (HSS) in New York, USA, which is famous for its orthopedics and rheumatology departments. There are three forms of arthritis specialty in China. The first form is specialized hospitals within large general hospitals, such as the Joint Surgery Hospital of Xi'an Honghui Hospital in Shaanxi Province and the Orthopedic Hospital of Shanghai Changzheng Hospital, most of which are entities without legal personality. The second form is general hospitals with distinctive specialties, such as the Luoyang Orthopedic-Traumatological Hospital of Henan Province and Shandong Wendeng Osteopathic Hospital. The third form is specialized arthritis hospitals, such as Shanghai Guanghua Hospital of Integrated Traditional Chinese and Western Medicine.

According to the census data from the National Bureau of Statistics of China, the aged 65 and above population has been increasing dramatically from 2008 to 2020. By 2020, the population aged 60 or above reached 264.02 million, accounting for 18.7% of the total population in China, and the population aged 65 and above reached 190.64 million, accounting for 13.5% of the total population. The number of Chinese aged 65 or above and the changing trend from 2008 to 2020 are shown in Figure 1.1. It suggests that there is an accelerated increase in population aging in China.

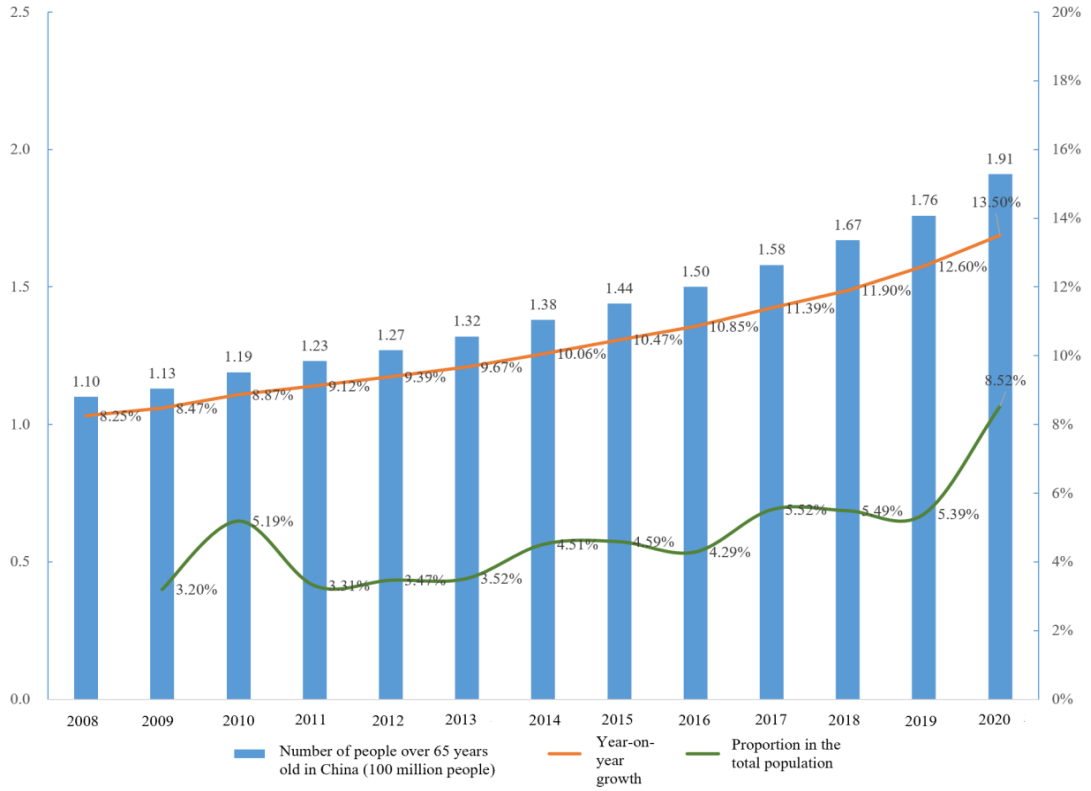

Figure 1.1 Number of Chinese aged 65 or above and the trend of change from 2008 to 2020 (Unit: 100 million people, %)

With the aging of the Chinese population, the demand for Osteoarthropathy Department is

also increasing. The number of visits to arthritis hospitals rose from 2012 to 2019. By 2019, there were 16,694,400 outpatient visits, up by 6.39% compared with the figure of 2018. The number of patient visits to arthritis hospitals in China and the year-on-year growth rate from 2012 to 2022 are shown in Figure 1.2.

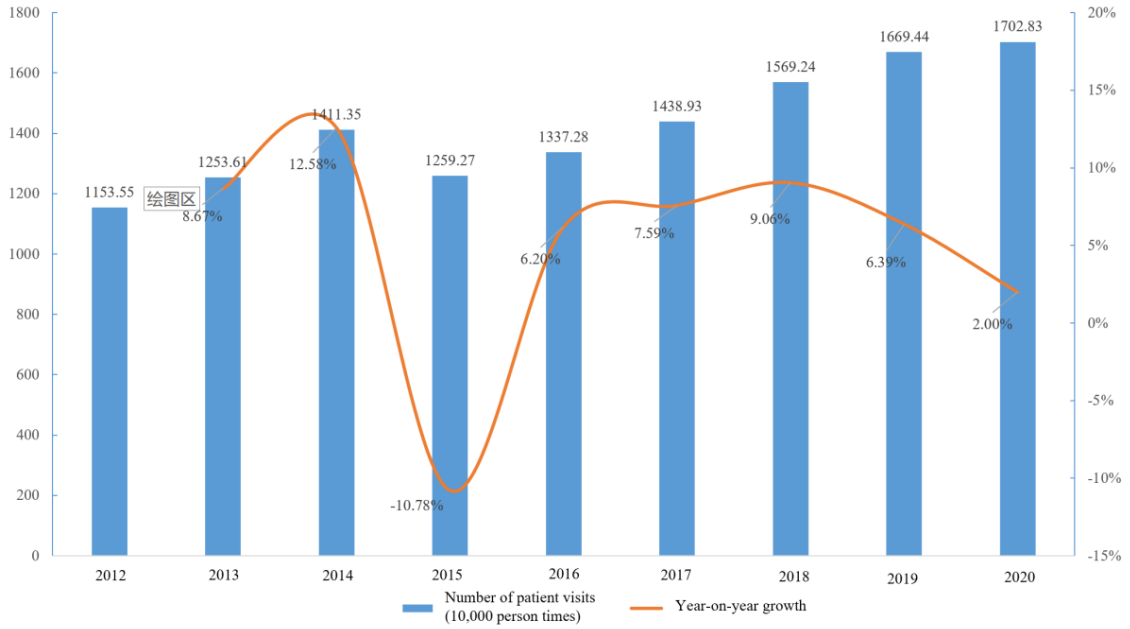

Figure 1.2 Number of patient visits to arthritis hospitals and year-on-year growth from 2012 to 2020 (Unit: 100 million people, %)

In contrast to the significantly increasing demand for arthritis treatment, there is only a minor increase in the number of arthritis hospitals, with a sluggish growth in industry supply. On March 17, 2009, the Central Committee of the Communist Party of China (CPC) and the State Council issued *Opinions on Deepening the Reform of the Medical and Health Care System* which put forward the near-term goal of "effectively reducing the burden of medical expenses on residents and effectively alleviating the 'difficult and expensive access to medical treatment' and the long-term goal of establishing a sound basic medical and health care system covering urban and rural residents and providing the masses with safe, effective, convenient and inexpensive medical and health care services".

With the encouragement of national policies, the arthritis hospitals have gradually achieved a relatively high level of market-oriented operation. By the end of 2019, the total number of arthritis hospitals in China reached 663, with a year-on-year growth of 1.38%. The number and growth of arthritis hospitals in China from 2012 to 2019 are shown in Figure 1.3.

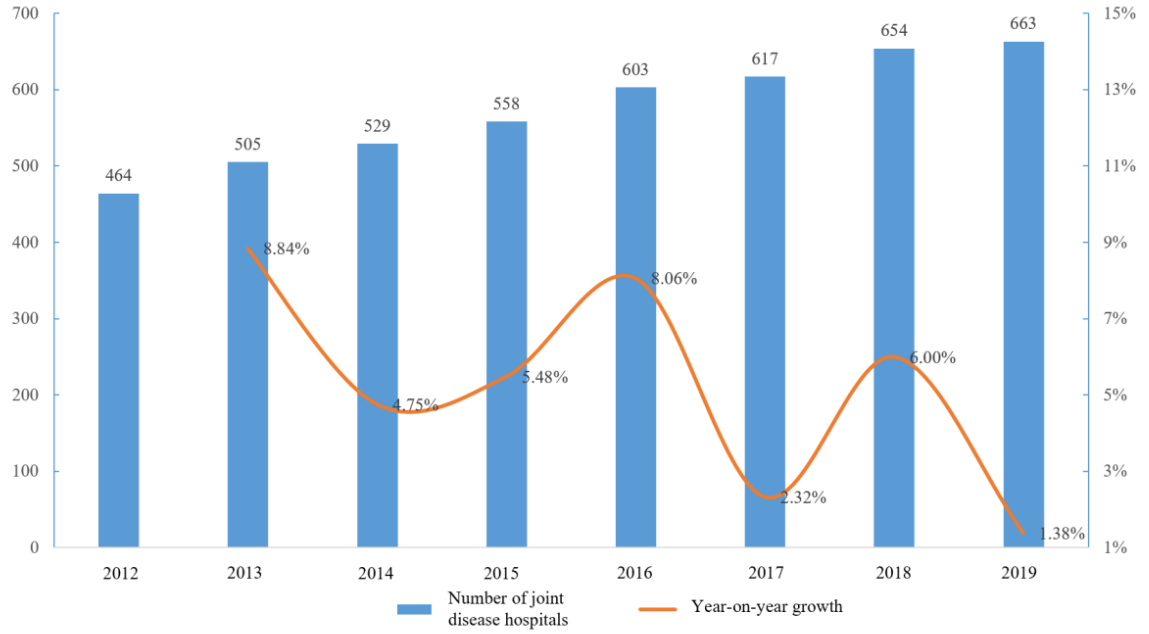

Figure 1.3 Number and growth of arthritis hospitals in China

Regarding the ranking and evaluation system in the *2020 China's Hospital Rankings (National General)* and *2020 China's Hospital Rankings (Specialty Reputation)* released by the Hospital Management Institute of Fudan University and the *2020 China's Specialty Ranking (Scientific Research)* released by Guangzhou Alibi, we select four hospitals to analyze their status quo of development as per Table 1.1. The four hospitals are Longhua Hospital, Shanghai University of Traditional Chinese Medicine, Renji Hospital, affiliated to Shanghai Jiaotong University School of Medicine, Shandong Wendeng Osteopathic Hospital, and Foshan Hospital of TCM.

Table 1.1 Status quo of benchmark hospitals in China

	Shaanxi Province Xi'an Honghui Hospital	Henan Provincial Orthopedic Hospital	Shandong Province Wendeng Osteopathic Hospital	Guangdong Province Foshan Hospital of TCM
Region	Shaanxi Province	Henan Province	Shandong Province	Guangdong Province
Hospital level	Grade A tertiary hospital	Grade A tertiary hospital	Grade A tertiary hospital	Grade A tertiary hospital
Hospital category	Orthopedic hospital	Orthopedic hospital	Orthopedic hospital	Orthopedic hospital
Specialty name	Orthopedic surgery	Orthopedic surgery	Orthopedic surgery	Orthopedic surgery
Beds	1600	2334	1000	1057
Number of related departments	49	109	11	17

Annual treatment volume (10,000 visits)	86	60	30	67
Amount of surgeries (10,000 times)	6	4.8	2	3.14
National key specialty	Yes	Yes	Yes	Yes
Doctors with senior professional titles	408	400	146	440
Specialty ranking	-	1	-	1

1.1.2 Problems in the development of public arthritis hospitals

Since China is undergoing economic transformation, social restructuring, and technological and cultural reinvention, the internal and external environments, as well as the organizational variables affecting the development of public hospitals, are becoming increasingly unpredictable (J. Zhang & Sun, 2019). As the medical division of labor becomes increasingly specified, the primary and secondary hospitals' scale and medical service levels are always smaller and lower than those of tertiary hospitals. This above problem leads to failure to respond to the growing public demands for specialist care. However, even in some tertiary hospitals, specialist treatment cannot meet the current medical needs. For example, most general tertiary hospitals have not established the Department of Rheumatic Arthritis. However, millions of patients contract rheumatic diseases every year in China. Most seek treatment in the Department of Rheumatology or Department of Orthopedics, leading to the unreasonable allocation of medical resources. Due to factors such as strategic planning of hospital development and output efficiency, the investment of medical resources in key specialties is also different among the hospitals. Most hospitals allocate resources based on "focusing on the advantageous specialties and improving coverage of all specialties" to benefit more patients. As a result, the medical treatment level of some specialties and diseases in these hospitals could be better. Therefore, multidisciplinary cooperation has great potential for development, and it is of great significance to deepen and accelerate the research on the development strategy of arthritis hospitals. The main problems facing the development of specialized public hospitals are as follows.

(1) The development strategy is different from the new competition model.

Thanks to the support of central and local government policies, public hospitals are in a relatively advantageous position in the medical service market, and most of them have no

awareness of the competition. In particular, large public hospitals are positioned as the leading medical service suppliers in the region and need to be faster in strengthening their service capacity building. With the gradual liberalization of the medical market, more social capital swarms to the medical industry, the hierarchical diagnosis and treatment system are becoming increasingly perfect, and the comprehensive reform of urban public hospitals has been fully implemented. In this context, as regional public service institutions, public hospitals must re-examine themselves and find out whether their development strategies can meet the needs of patients and take on the challenges of the market. It is an issue that public hospitals cannot avoid. Specialized hospitals should formulate dynamic development strategies to improve their competitiveness as providers of characteristic medical services.

(2) Health management and evaluation system cannot promote medical capacity building.

The development of large public hospitals in China is often centered around hospital accreditation and evaluation implemented by the government. In recent years, their hospital rankings have appeared to be released by academic institutions, social groups, or companies. To a certain extent, accreditation and evaluation of public hospitals have contributed to their development and management. However, most large public hospitals need to focus more on external accreditation and assessment and do their utmost to improve relevant medical outcome indicators. They have been actively developing vital national disciplines and establishing national key laboratories. However, neither of the two efforts can reflect the service capacity and management level of large public hospitals, let alone the specialized hospitals.

(3) Orientation of specialist talent training is unreasonable.

Large public hospitals are mainly tertiary hospitals with comprehensive solid strength in clinical treatment, scientific research, teaching, and management. The specialties in these hospitals have intense medical technology levels, continuous innovation ability, and scientific research ability, which attracts plenty of high-quality specialists and medical talents. A good talent echelon guarantees the clinical medical service system and large hospitals' research and teaching practice. The one-dimensional evaluation mechanism attaching undue importance to "academic papers, educational background, awards, and job titles" completely deviates from the original purpose of talent training, which leads to unreasonable orientation in talent training. In August 2021, the National Health Commission and the State Bureau of Traditional Chinese Medicine issued the *Guiding Opinions on Deepening the Reform of the Professional Title System of Health Professionals and Technical Staff* to reverse the incorrect orientation from the top-level design. However, it still takes time to witness the change.

(4) The total amount of health resources is significant, but the overall quality could be

higher.

In terms of the technical and medical service capacity, some things still need fixing. The total amount of medical resources need to be increased; incredibly high-quality medical resources. The development of the medical service system is different from economic and social development and cannot meet medical needs. The structure and allocation of medical resources are unreasonable, and the overall medical service efficiency is not high (L. C. Ma et al., 2017). One of the critical issues that hospitals need to pay attention to is how to strengthen the internal capabilities of large hospitals and promote their reasonable development. The strength of capacity determines whether a large public hospital can indeed assume its due responsibility in the delivery of healthcare services. The acquisition and maintenance of dynamic capabilities is the core task for the sustainable development of large public hospitals.

With the above public data, specialized hospitals have a significant advantage in allocating static resources. On the contrary, specialties in general hospitals need more access to static resources due to intra-hospital competition and various other factors. Regarding exogenous resource utilization, public Western or Chinese medicine hospitals are still inferior to specialized hospitals. Continuous input of resources will increase the advantages of endogenous resources, and these rare and imperfectly imitable resources will be gradually extended to the whole medical service process of the hospital. In ideal conditions, dynamic endogenous resources are continuously optimized and innovated. They can even invent new technologies to promote the development of the whole industry, forming a virtuous cycle of this closed loop.

The development strategy presents a long-term, systematic and holistic plan for the hospital's future development. Hospital competitiveness is the capability of a hospital to foster a competitive advantage that can support its past, present, and future and take the initiative in the competitive environment for a long time. Three new trends have emerged in the theoretical research on strategic enterprise management since the 1990s. First, the academic focus on competitive advantage shifted from a positioning-based view to a resource-based view of competitive advantage, and the Core Competence Theory appeared. The second is the emphasis on the learning view of strategy formation, which holds that the only sustainable competitive advantage is the ability to learn faster than the competitors. The formation method is to establish a learning organization. The third is the adoption of a new perspective. Theories of strategy before the 1990s focused more on competition and competitive advantage. However, after the 1990s, with the increasingly dynamic environment, dynamic capabilities gradually became the focus of research on corporate strategic management. Dynamic capabilities refer to the ability of an organization to integrate, create, and reconfigure internal and external resources to seek

and exploit opportunities in a changing external environment continuously, which means the ability of an enterprise to reconstruct, deploy, and utilize its core competencies so that it can keep pace with the times. In this context, dynamic capabilities have become a new focus in developing strategic management theory. What is the competitive advantage of arthritis hospitals? What are the core competencies? Based on the case study method, we analyze the meaning of dynamic capability and the relationship between dynamic capability and competitive advantage of the arthritis hospitals to provide a basis for formulating a new round of development strategies for arthritis hospitals and empirically test the theoretical framework and theoretical hypotheses of dynamic capabilities.

1.2 Research purpose and significance

The continued economic growth of China has led to a growing public demand for high-quality medical technology and medical services. However, homogeneous competition in hospitals is becoming increasingly more apparent, and limited medical resources can hardly meet patients' growing medical needs and psychological expectations, leading to dissatisfaction with medical services from a significant portion of patients. With the pilot reform of public hospitals, the promotion of the basic medical security system, and the establishment of the national essential drug system, the operating pressure for specialized hospitals has been gradually increased, and the cost of medical equipment, medical supplies, medicine, workforce, and other resources continue to grow. In the new medical reform, although the government's investment responsibility and compensation mechanism are clear, the development positioning and supportive policies of specialized hospitals still need to be precise. Establishing and developing private medical institutions will also bring impacts and challenges to public hospitals. How to grasp the direction of public hospital reform and management innovation, enhance the core competitiveness of specialist hospitals, and develop the dynamic capabilities of hospitals, arthritis has become a significant threat to human health. With China's aging population, the prevalence, incidence, and total number of arthritis are increasing. The supply of arthritis hospitals, arthritis specialists, and arthritis medical staff needs to meet the growing demand for medical care. This is where the dilemma of this research lies.

Research on the development of specialized hospitals mainly focuses on the economic interests and benefits of hospitals, state subsidies and revenues, and the scale comparison between specialized hospitals and general hospitals. The dilemmas specialized hospitals face are more in the textual description and phenomenological analysis, needing more systematic

evaluation and analysis of how to maintain the competitive advantage and what coping strategies should be adopted. It is worthy of an in-depth study to explore how to analyze the relevant factors affecting the competitive advantage of the specialized hospital for arthritis through the analysis of dynamic capabilities, how to comprehensively analyze and summarize the problems and root causes in the development of arthritis hospitals, and how to create more room for growth for the specialized hospital through replicable and generalized development strategies.

Competitive analysis is a means to enable companies to exploit their strengths and environmental opportunities to achieve self-knowledge fully. What are the core competencies and dynamic capabilities of specialized hospitals? What are the reasons for the gradual loss of competitive advantage of specialized hospitals? What is the relationship between dynamic capabilities and competitive advantages? How to address the changing environment and maintain a competitive advantage? How can we respond to the changing environment and maintain a competitive advantage? Suppose the relevant factors affecting the development of arthritis hospitals can be identified through this research. In that case, we can focus on coping strategies and explore a better development path for arthritis hospitals. Therefore, this research has great practical significance. It contributes to the healthy and sustainable development of the discipline. It can help formulate a new round of hospital development strategies, enhance the core competitiveness, and form the dynamic capabilities of the hospital.

1.3 Research questions

From the perspective of the current reality, the external environment of hospitals has changed profoundly. With the rapid development of science and technology, more and more new treatment modalities are emerging, and treatment guidelines are frequently updated. Therefore, we must review and revise our past medical knowledge, which will inevitably lead to a conflict between old and new treatment philosophies. In addition, as the public demands for healthcare become more diversified, competition among hospitals has become increasingly fierce. With the spread of new technologies, the competitive advantages of hospitals become fleeting. Hospitals face an important and challenging problem: building sustainable benefits in the face of the complex and changing external environment. Creating a competitive advantage effectively and continuously is of great importance in this case. Otherwise, despite the long history and honor, they may be destroyed without warning because of their inability to keep up with the development process.

The core question of this study is to analyze the development strategies of arthritis hospitals to gain competitive advantage in a dynamic and changing environment, and the author decomposes the core question into three more specific sub-questions.

(1) Sub-question 1: What is the content of the dynamic capabilities of arthritis-specialized hospitals in an uncertain external environment?

(2) Sub-question 2: How can dynamic capabilities provide a sustainable competitive advantage for arthritis-specialized hospitals?

(3) Sub-question 3: In a dynamic and changing environment, how can arthritis-specialized hospitals build and enhance dynamic capabilities?

1.4 Research methodology

1.4.1 Case study

To gain an in-depth understanding of the current environmental realities facing arthritis-specialized hospitals and the impact of dynamic capabilities on sustained competitive advantage, we intend to use the case study approach to conduct in-depth interviews with academic leaders in orthopedics and traumatology as well as middle and senior administrators of arthritis specialized hospitals in China. The interviews are semi-structured and cover three main points. First, the basic situation and business development level of the interviewee's hospital/department, the development positioning and goal of the hospital/department, and the main challenges and problems facing the development of the hospital/department. Second, the competitive advantages of the interviewee's hospital/department, including the current core competitiveness of the hospital/department and what measures are in place to strengthen the core competitiveness in response to changes in the external environment. Third, the capacity development of the interviewee's hospital/department. The interview is mainly based on the perspective of dynamic capabilities, intending to explore the connotation and dimensions of the application of dynamic capabilities to public hospitals and the specific measures taken by the hospital/department to develop dynamic capabilities. The expected outcomes of the study are as follows.

1. It is expected to understand China's orthopedic and arthritis-specialized hospitals' development, core competitiveness, discipline construction, talent training, and operation strategy.

2. It is expected to understand the strategic adjustment of China's orthopedic and arthritis-

specialized hospitals in response to the reform of medical, health insurance, and pharmaceutical policies and changes in demographic structure and economic situation.

3. It is expected to improve the new round of development strategy and the 14th Five-Year Plan of Shanghai Guanghua Hospital of Integrated Traditional Chinese and Western Medicine based on the dynamic capabilities theory and the consensus reached from the expert interview.

1.4.2 Statistical analysis

This study proposes to use a case study approach of the Grounded Theory to create a database using QSR Nvivo 11 Plus to perform relevant statistical analysis of the qualitative material.

1.5 Thesis structure and content overview

Chapter 1: Introduction: Identify research problems and propose research questions based on the research background and the current state of arthritis and arthritis hospitals.

Chapter 2: Literature Review: Review the development of strategic management theory and dynamic capabilities theory chronologically; analyze the development trend of Chinese public hospitals and explain the connotation of dynamic capabilities of Chinese public hospitals.

Chapter 3: Methodology: Explain the qualitative research methods and steps of the case study, introduce the analysis software (Nvivo) used in this study, as well as the workflow and data analysis methods.

Chapter 4: Field Research: (1) Boil down the connotation of the qualitative materials and establish a consensus among the interviewed experts on the development strategy and dynamic capabilities of the arthritis hospitals; (2) Conduct strategic analysis using Shanghai Guanghua Hospital of Integrated Traditional Chinese and Western Medicine as the case; compare the consensus of experts with the hospital's discipline development strategy; organize focus groups to evaluate the strategy implementation.

Chapter 5: Discussion and Analysis: Summarize the conclusions, the research innovations and limitations, and the outlook for future research.

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Chapter 2: Literature Review

The Core Competence Theory and Resource-based Theory analyze a company's competitive advantage from a static perspective. However, since the 1990s, the external environment of companies has been full of uncertainties due to rapid technological development and market changes. In such a drastically changing environment, technological innovation and changes in consumer preferences can wipe out the established competitive advantage of any company. In addition, a company's competitive advantage has been constantly challenged by its imitators and innovators. In this case, it will lose its competitive advantage as soon as it is successfully imitated or outperformed by its competitors. The key to long-term success for any company is not the short-lived competitive advantage that can only be maintained temporarily but the sustained competitive advantage that can withstand aggressive competition and adapt to external changes in the long term. After the emergence of the Core Competence Theory, it was once believed that core competence was the source of sustained competitive advantage. However, with the advent of the knowledge-based economy, people began to recognize the existence of core rigidity which prevents the core competence from adapting to external changes. In a dynamic and changing environment, a company's previously established core competence cannot sustain its competitive advantage forever. From the dynamic capabilities perspective, resources and capabilities are distinctly differentiated, and competitive advantages stem from dynamic capabilities rather than resources. It emphasizes capabilities more than resources because the value of resources tends to depreciate rapidly in a dynamic market environment (Collis & Montgomery, 2008).

A review of existing literature indicates that although the resource-based view and dynamic capabilities perspective are frequently referred to in research on strategic development (Lockett et al., 2009), scholars began to carry out empirical research on dynamic capabilities only for the recent years. Researchers at home and abroad have used dynamic capabilities to analyze corporate strategies for crisis handling. However, only some scholars have used dynamic capabilities to study the competitive advantage of healthcare organizations. Peng et al. (2008) argue that the "process" dimension in the dynamic capabilities framework suggests ways for hospitals to develop competitive advantages. Hospitals can gain sustained competitive advantage through continuous integration, reconfiguration, and organizational learning. In the

following part, we review the literature on the development of the strategic management theory and dynamic capabilities theory, the connotation and dimension of dynamic capabilities, and the application of dynamic capabilities to the strategic management of hospitals.

2.1 Definition of relevant concepts

2.1.1 Capability

Capability is a resource with specific functions. Apart from being a practically significant resource, it can also integrate practical and potential resources. From the economic point of view, capability means that an individual or an organization can convert one type of resource into another or turn it into social wealth. Capability is divided into individual capability, organizational capability, and system capability. Capability is the ability of an individual or organization to accept or perform a task voluntarily, actively, and consistently in a particular situation (OECD, 2006).

2.1.2 Dynamic capabilities

The dynamic capabilities of an organization are the ability to reconfiguration, allocate and utilize its core competencies by integrating, creating, and reorganizing its internal and external resources and continuously seeking and exploiting opportunities in a changing external environment. Dynamic capabilities refer to an organization redistributing its internal and external technologies, resources, and functions in a changing environment by adjusting organizational strategies and decisions. Dynamic capabilities are a new research trend in the field of strategic management at present.

2.1.3 Hospital dynamic capabilities

Perceptual identification, coordination and integration, soft management, and improvisational ability are the main components of dynamic hospital capabilities. A reasonable classification structure plays a critical role in understanding and evaluating the dynamic capabilities of public healthcare organizations. Teece et al. (1997) classified dynamic capabilities into four dimensions: integration, learning, reconfiguration, and transformation. He et al. (2006a) proposed six dimensions of dynamic organizational capabilities: customer value orientation, technical support system, organizational support system, institutional support mechanism, driving force renewal mechanism, and strategic isolation mechanism. Although researchers at

home and abroad currently hold different views on the dimensional structure of corporate dynamic capabilities, they all emphasize obtaining a sustained organizational competitive advantage through identification, integration, reorganization, absorption, and innovation. Public healthcare organizations, in particular public hospitals, should recognize the risks and opportunities in the healthcare environment, and integrate and reorganize their internal and external resources, to promote medical institution reform and medical technology upgrading and achieve a balance between supply and demand of healthcare services (Wang & Zan, 2015).

2.2 Strategic management theory

2.2.1 Overview of strategy and strategic management

The word strategy ("Zhan lue" in Chinese) is originally a military term, in which "zhan" refers to battle and warfare and "lue" refers to plans and tactics. Therefore, the original meaning of "strategy" is the planning and deployment of battles. With social development and technological advancement, strategy has been defined as an operational arrangement or development plan to deal with a significant event or competition to gain a competitive advantage and obtain sustainable development (Bailey & Behaylu, 2022). Enterprises often have multiple management levels, high to low, including enterprise management, business, and functional departments. Correspondingly, strategic business units are generally divided into management-level, business-level, and functional-level strategic (Zhao, 2022). Strategic management was first introduced in Ansoff's book *From Strategic Planning to Strategic Management* in 1976. In 1979, he published *the Theory of Strategic Management* and clearly defined strategic management (Yun, 2014). Strategic management refers to a series of decisions and actions taken by a company to achieve long-term survival and development goals. After years of application, optimization, and improvement, strategic management has enabled many enterprises to formulate strategic initiatives in operation and long-term planning in management. This way, enterprises can plan long-term overall corporate development based on their external environment, internal resources, and comprehensive capability. Through approaches of analysis and formulation, evaluation and selection, as well as implementation and control, enterprises can realize dynamic management of their strategic goals (Akyuz & Gursoy, 2020).

2.2.2 Evolution and development of strategic management

The evolution of strategic management has gone through three stages, namely, the production

management stage, the operation management stage, and the strategic management stage. The first stage is the production management stage. In this stage, it is enough to "do one's job well" and quickly carry out production activities to meet the supply and demand in the market. In the second stage of operation management, enterprises need to meet the supply and demand of the market but also should reduce costs, improve efficiency and satisfy customers. In other words, it is an improvement in service quality and efficiency. In the third stage of strategic management, enterprises should analyze their internal strengths, weaknesses, and external opportunities and threats and identify their market positioning, core competitiveness, vision, and values. As a result, the closed-loop management of strategic analysis, strategic selection, strategic planning, strategic implementation, and strategic control has been formed. In this case, strategic planning and operational management are seamlessly integrated to operate stably and efficiently (Köseoğlu & Parnell, 2020; Szymczyk, 2019).

The focus of strategic management has been changing throughout its development. At first, the focus was on increasing profits and discovering new profit growth points. The foundation was economic analysis methods such as SWOT analysis and some environment-matching strategies. Later, with the development of strategic management theory, companies began to focus on the various factors affecting the success or failure of strategy using Porter's value chain analysis to assess the value of all the company's processes. The success of some Japanese companies has extended the content of strategic management, with flexible manufacturing systems, just-in-time manufacturing systems, and lean production systems being added. The core competence theory proposed in the 1990s focuses on the formation and maintenance of core competence, laying a foundation for many subsequent strategic management theories (Parry et al., 2010), such as the strategic management theory based on corporate culture, and the strategic management theory based on the establishment of learning organizations.

The focus of theoretical research on strategic management has also been changing. Before the emergence of strategic management theory, business research focused on improving productive forces, seeking to maximize output with limited resources using microeconomics. Later, in the early days, after the emergence of strategic management theory, the research focus shifted to the internal resources and capabilities of the company and the external environment. The industrial organization school, for example, advocates the corporate activity capabilities and changes in the external environment, placing little emphasis on the internal aspects of the company, and it is a representative of externally oriented strategic management. The capability and resource school, on the other hand, emphasizes the internal resources and capabilities of the company itself and advocates internal training to improve its competitiveness, hoping to

gain a stable market through internal advantages and core competence. In the commercial development stage, the commercial ecosystem school emerges, inheriting the characteristics of both the industrial organization school and the capability and resource school. In addition to focusing on the internal capabilities and resources of enterprises, it also studies the external environment and activity capabilities of enterprises, making internal and external factors equally crucial in strategic management.

2.2.3 Schools of strategic management theory

Many schools of thought have emerged in the development of strategic management. Specifically, there are the design school, the planning school, the positioning school, the cognitive school, the learning school, the power school, the cultural school, the configuration school, the environmental school, and the entrepreneurial school (Monib et al., 2021). However, in general, they all analyze the internal and external environment and risks, strengths, and weaknesses and use methods such as analysis, planning, learning, cognition, and integration to achieve strategic management (Dong, 2018).

Managers are the designers of strategy and need to design and organize management activities to make a plan for the enterprise's mission and task (Ongaro & Ferlie, 2020). The design school is represented by Philip Selznick and his *Leadership in Business Administration*, Alfred Chandler and his *Strategy and Structure*, and Kenneth Andrews and his *Business Policy: Text and Cases*. This school believes strategy formation is a conscious, controlled, and deliberate thinking process, and effective strategy is formed through rigorous thinking.

In The Rise and Fall of Strategic Planning, Mintzberg comments on the planning school that staff departments take over the formulation of strategic plans. However, they attach excessive importance to analysis and forecasting, needing more true strategic insight. The planning school is represented by Igor Ansoff and his *Corporation Strateg*y and Schendel and Hofer and their *Strategic Management*. The planning school believes strategy formulation is controlled, voluntary, and formal. The organization's top leaders are responsible for the entire strategy process. Strategic management is a complete process that needs to be broken down into objectives, budgets, schedules, and operations to be well implemented (Deng & Zhang, 2000).

The positioning school, represented by Porter and his *Competitive Strategy* and *Competitive Advantage*, believes that strategy is the identification of a firm's position in the marketplace, and the strategic process is a selection process based on analysis and calculation, in which strategic analysts play an essential role (Wen, 2009). The positioning school has opened up many new avenues for strategic management research and provided powerful theoretical tools

for strategic analysis. It is relatively conservative because it emphasizes industry stability and excessively formalizes and generalizes the process and content of strategy formulation.

The positioning school must also solve the separation problem between thinking and acting. Knight and his *Entrepreneurship represent the entrepreneurial school: Dealing with Uncertainty*, Collins and Moore, and *The Organization Makers*. This school believes that the generation and formation of strategy are related to the traits of business managers, such as intuition, wisdom, insight, and thinking patterns. The core concept is to focus on the corporate vision. It analyzes the overall strategy and focuses on the details for further optimization and refinement, making it possible for an organization to implement an improvisational management model.

The learning school sees strategy as a shared learning process in which companies understand and formulate strategies. Strategy is a learning process for both the individual leaders and the leadership team, and the role of leaders is to organize the strategic learning process (Ran, 2008). Representative scholars and works include Charles Lindblom, *The Science of Muddling Through*, James Brian Quinn and his *Emergency Strategy: Logic Incrementalism*, and Peter Senge and *The Fifth Discipline*.

The environmental school, represented by Hannan and Freeman, believes that the environment plays a dominant role in the strategic management of an organization. As an integrated factor, the environment is the core that influences the design and formation of strategy. Strategy formulation is a representation and adjustment of the external environment. The selection mechanism of the environment exerts a decisive influence on the survival and development of an organization (Wu & Wan, 2015).

The configuration school views strategy formation as a change process, and corporate strategy should be defined in dual processes to reflect its nature and characteristics. Henry Mintzberg is the representative scholar of the configuration school. This school offers a way to reconcile the different schools of thought, contending that the different schools of thought are proposed at different times from different perspectives, which brings a new order to research on strategic management (Azevedo & Gates, 2019).

2.2.4 Analytical model for strategic management

The competitive strategic view with companies as the core was the dominant view of corporate strategy in the United States in the mid-1980s. The positioning school was the dominant theory of strategic management. The main research results of the rational strategic analysis model come from strategic management. The positioning school views strategic decision-making as a

rational analysis of the enterprise. It believes that the strategic process identifies and realizes the organization's positioning in the market. Therefore, the following three aspects should be considered in strategic management. (1) Strategic analysis and choice are performed based on rational calculation, and the optimal strategy type and strategy are identified according to the particularity and competitive advantage of the industry; (2) Strategic analysts play a vital role in strategic positioning. They report the results of calculation and analysis to the managers who make the final strategic decisions; (3) Strategy must be decomposed and implemented at various levels within the company, and specific relationships should be adjusted within the organization to meet the requirements of strategic management. The representative centralized analysis models include the S-SCP, Porter's "Five Forces Model" and Mintzberg's "5Ps of Strategy".

(1) S-SCP analysis model

The S-SCP model consists of industrial structure - strategic conduct of the firm (general strategy type and firm-specific strategy type - structural matching of various activities within the firm to the strategy - firm competitiveness) - industrial performance. The model takes the industrial structure as the starting point, showing that its strategic conduct is determined by the industrial structure (environment) in which it is located; the strategic conduct of the firm itself can also constitute a logical relationship of SCP. S is the general strategic type chosen by the firm in the SCP. The strategic cluster in which a firm is located is determined by its strategic position within the industry. Firms in the same strategic cluster usually adopt the same general strategy type. However, specific firms adopt specific ways to implement the general strategy type, thus constituting their unique strategic type and competitive model. C refers to the implementation of a firm's strategic conduct. A firm's strategic type and competitive model will determine the structures, systems, and activities. P refers to the effectiveness of strategy implementation, namely, the firm's competitiveness and performance. The integrated competitiveness of firms constitutes industrial competitiveness and performance (Figure c.1).

(2) The Five Forces Model

The Five Forces Model (Figure c.2) proposed by Porter can effectively analyze the structure of an industry and the various factors influencing the structure of an industry, and the profit potential of the industry. It can suggest the timing and manner of entering or exiting a particular industry from the perspective of profit potential and depict the interrelationships of the major stakeholder groups in an industry.

(3) 5Ps of strategy

Mintzberg's "5Ps of Strategy" model (Figure c.3) outlines the entrepreneurial, cognitive, learning, power, cultural, environmental, and structural schools of strategy and analyzes the

connotation of strategy from five approaches: plan, ploy, pattern, position, and perspective.

2.3 Dynamic capabilities and their development

2.3.1 Resource-based theory

Before the emergence of resource-based theory, strategic management theory was dominated by the Positioning School represented by Porter (1985). This school of thought analyzes competitive advantage based on industrial organization theory, and there are two implicit basic assumptions for the analysis. According to the resource-based theory, internal resources are more crucial for a company to gain a competitive advantage than external ones. First, enterprises within an industry are homogeneous; second, even if there is heterogeneity within an industry, it results from the enterprise's utilization of highly mobile resources in implementing strategies, and it exists only for a brief period. The competitive advantage of an enterprise originates from the industry or market structure, yet it is difficult to explain the differences among enterprises within the same industry. This indicates that reasons for differences in corporate performance are not limited to external factors, and the internal factors of different enterprises should also be considered.

Selznick (1957) and Penrose (1959) made outstanding contributions to the development of the resource-based view. In 1984, Birger Wernerfelt released *A Resource-based View of the Firm* and emphasized the importance of a firm's internal resources in making a profit and maintaining its competitive advantage. His ideas exerted a significant impact on strategic management throughout the 1980s. In addition, Barney was crucial to developing the resource-based view, and most scholars consider the article *Firm Resources and Sustained Competitive Advantage* released by Barney (1991) to be the founding work of the resource-based view. The core of the resource-based theory is two major assumptions and four characteristics of resources. The two assumptions are: (1) resources among firms are heterogeneous; and (2) resource heterogeneity among firms persists (Barney, 1991; Barney & Arikan, 2017). They believe that the competitive advantage within a firm is derived from the resources it controls (Lorenzoni & Lipparini, 1999; Loewenstein & Gentner, 2005).

In *Firm Resources and Sustained Competitive Advantage,* Barney (1991) illustrates the evolution of the four characteristics of resources from VRIN to VIRO. In other words, in the original four characteristics of valuable, rare, inimitable, and non-substitutable, the last characteristic is changed to the organization, which means the ability of the firm to exploit the

resource or capability. Figure 2.1 shows the evolution of Barney's analytical framework for competitive advantage. He believes that the value of resources is that firms can use them to develop markets and reduce the threat of competitors. In contrast, the rarity of resources is reflected in the fact that there is no commonality among the competitors' resources, and each resource has its characteristics. Inimitability and substitutability represent competitors' difficulty in imitating or copying a specific resource. These characteristics determine whether the resource can become a competitive advantage for the firm. The firm's competitive advantage depends on these resources and capabilities, and managers must seek valuable, rare, and inimitable resources within the firm and then develop and exploit these resources. The absence of any one of the four aspects will significantly reduce the final effect.

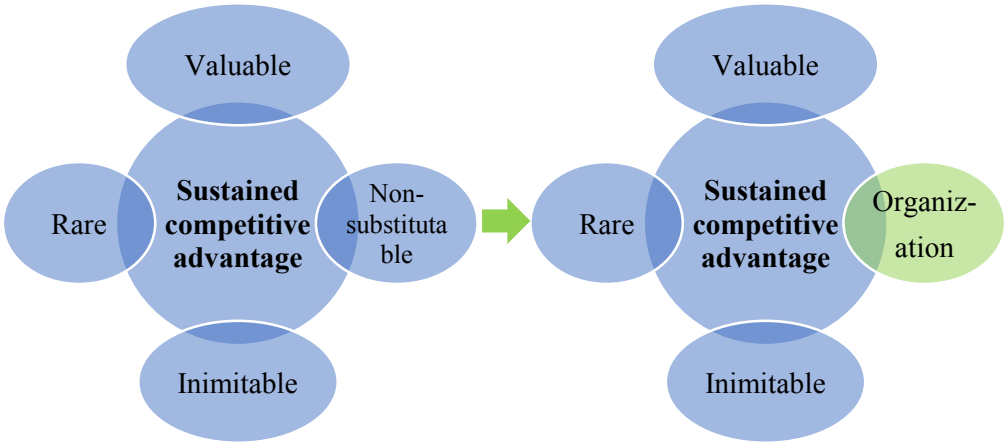

Figure 2.1 Barney's analytical framework of competitive advantage

Hitt et al. (2001) explored the role of human resources and argued that high-level talents (people with high technical skills and rich experience) are valuable, rare, inimitable, and non-substitutable. Therefore, as high-level human resources continue to increase, corporate performance and competitive advantage will be significantly affected. However, they also note that developing high-level talents takes time (Dierickx & Cool, 1989), and the costs may outweigh the benefits in the short run. However, such an investment may lead to a long-term and sustained competitive advantage for the firm.

Another significant contribution to the resource-based view is Peteraf (1993), who argues that for firms to maintain their sustained competitive advantage, four conditions must be met: heterogeneity, ex-post limits to competition, poor mobility, and ex-ante limits to competition. First, the resources owned by the firm should be heterogeneous, which is a guaranteed source of rents; second, the resources should be rare, which is a prerequisite for obtaining particular rents from a firm; third, it is difficult for a relatively weak firm to imitate its resources, and therefore it can obtain rents higher than its cost; finally, the non-substitutable resources

guarantee sustained rents (as shown in Figure 2.2). Once a firm has obtained certain rents, it needs to use its power to restrain competition from other firms to secure its monopoly position of ground rent and thus gain a sustained competitive advantage.

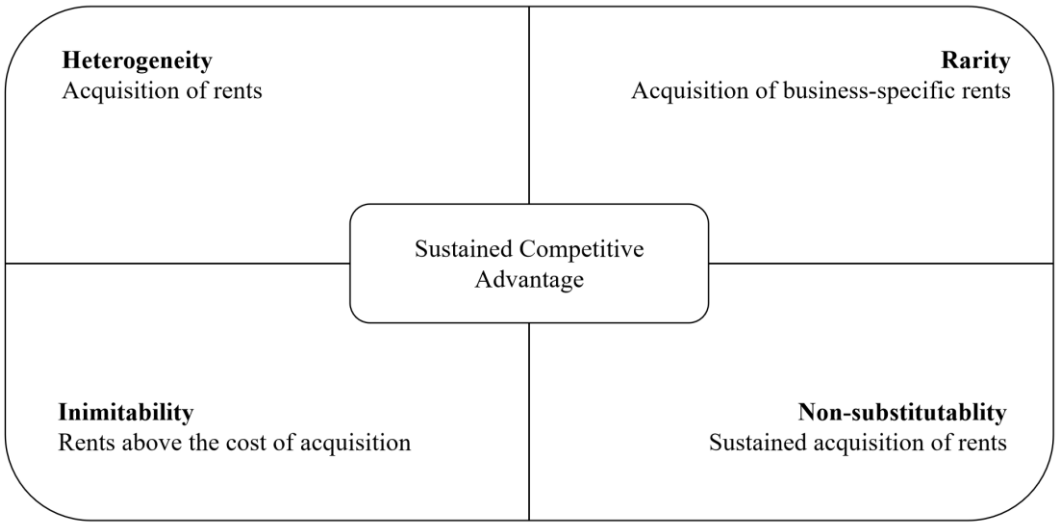

Figure 2.2 Peteraf's resource-based competitive advantage analysis framework

In summary, all these research results support the development of resource-based theory and illustrate the relationship between the characteristics of resources and the competitive advantage of enterprises from different perspectives. In the 1990s, with the restructuring of global industries and the increasingly fierce competition in each industry, the resource-based theory was questioned by subsequent scholars for its preference for static analysis and neglect of the dynamic characteristics of the market and the environment as well as their impact on the development of firms (Eisenhardt & Martin, 2000; Priem & Butler, 2001). Dynamic capabilities have gradually received attention from scholars because they explain the transformation of resources and capabilities (Helfat, 1997; Teece et al., 1997; Eisenhardt & Martin, 2000; Zahra & George, 2002), and the resource-based view is gradually shifting to the competence-based view, with a trend of complementary convergence between the two.

There are three main reasons for transforming resource-based theory into enterprise competence theory. First, resource-based theory and its related terms (resource, process, and core competence) lack clear definitions and are mainly based on the definition by Barney (1991). Resources that drive an enterprise to gain competitive advantage include its assets, capabilities, organizational processes, traits, information, and knowledge. These expressions fail to reflect the difference between resources and competencies. Second, the resource-based theory has been extensively criticized because of its static nature, which makes it difficult to sustain a competitive advantage in a dynamic environment (Veliyath & D'Aveni, 1996). The emergence

of the competence-based theory, especially the dynamic capabilities theory, can better explain the problem with dynamic integration and reconfiguration of capabilities. Finally, the resource-based theory has been questioned for failure to explain the mechanism inherent in the transformation of resources to competitive advantage, which is explained in the competence-based theory. Therefore it is essential to understand the development of the competence-based theory.

2.3.2 Competence-based theory of the firm

The traditional competence-based theory can be traced back to Adam Smith's theory of division of labor in the 18th century. Marshall's theory of enterprise internal growth proposed in the 1920s is the prototype of the competence-based theory, which believes that there is a "differentiated division of labor" among various enterprise functional departments, enterprises, and industries, and these divisions of labor are related to the knowledge and technology of enterprises. Nelson and Winter (2004) published *An Evolutionary Theory of Economic Change*, which recognized the importance of competence in business strategy. Enterprises are classified not according to their size; instead, they are categorized based on the different intellectual capital they own.

In order to clarify the development of a competence-based theory of the firm, we divide the evolution of competence-based theory into three stages and point out its relationship with a corporate competitive advantage.

2.3.2.1 Beginning stage (focus on production skills and technological innovation) (before 1920s)

After the emergence of the social division of labor, the level of enterprise competence is reflected by the level of individual ability of workers. Workers with solid abilities can use their advantages in resources and technology to achieve a competitive advantage. With the further development of productive force, machine production replaces handwork. As a result, the focus on enterprise competence changes to production skills and efficiency.

2.3.2.2 Development stage (focus on internal coordination of the company) (1920s to 1970s)

With the rapid development of capitalism, the scale of production is expanding continuously, resulting in a wave of mergers and the formation of monopolies between industries. Enterprises make high profits based on workers' high-intensity labor, but the workers' income does not increase. The discrepancy between the rich and the poor gradually increases, and contradictions

among different social classes are intensified. In this case, internal coordination and management become crucial, and enterprise competence in this stage is the internal coordination and management ability.

2.3.2.3 Deepening stage (focus on the integration of internal and external factors to obtain sustained competitive advantage) (the 1980s - early 21st century)

(1) Drastic changes in the external environment require enterprises to improve their environmental perception and adaptation capability

Before the 1980s, the market was relatively stable, and corporate strategies could remain unchanged for a long time. Enterprises at this stage competed mainly to win and protect their markets. However, in the 1990s, the logic of corporate competition changed. The key to successful competition in a harsh market environment became the ability to predict market trends accurately and swiftly respond to changing customer needs. Enterprises must adapt to the external environment and integrate external resources. At this stage, enterprises pay more attention to the external environment, and mastering the characteristics of environmental changes is the source of their competitive advantage. At the same time, their internal capabilities play a supporting role.

(2) The ability to acquire heterogeneous resources within an enterprise is the source of competitive advantage

Some scholars have criticized the exogenous theory of competitive advantage, arguing that endogenous factors play a decisive role. Therefore, the internal capabilities of an enterprise are the key source of competitive advantage. Wernerfelt (1984) argues that the internal heterogeneity of enterprises causes the differences between them, and the main reason for the heterogeneity of enterprises is the difference in the resources they possess. Barney (1991) contends that the competitive advantage of enterprises comes from the regulation of internal resources, and it is one-sided to attribute the source of competitive advantage to external sources only. Rumelt (1984) believes that because unique resources within enterprises provide them with specific capabilities, the efficiency of getting access to resources will vary significantly due to differences in the types of resources. The competence theory at this stage focuses on the heterogeneity of resources and the ability to construct resources, which are the source of competitive advantage.

(3) Proposition of core competence and dynamic capabilities theory

The innovation of core competence theory lies in identifying and cultivating core competence for an enterprise. This core skill is an essential skill that the entire team possesses

and is crucial in ensuring the successful implementation of organizational strategies. Hitt et al. (2001) define core competence (also known as core competitiveness) as a resource and capability that provides a company with a competitive advantage over its competitors. Hitt and Ireland (2001) argue that a firm's unique competencies, especially its internal core skills, enable it to produce profitable products and services, thus enabling the firm to sustain its competitive advantage. Core competence is established based on the core resources of an enterprise and is implied in the core products. It reflects the enterprise's comprehensive advantages, such as intelligence, technology, system, and culture, in the market. Generally speaking, the components of core competence mainly include intelligence, technology, system, and culture.

Prahalad and Hamel (1990) first suggest that a firm's core competence is the source of its sustained competitive advantage. They argue that this competence is the accumulation of knowledge within the firm, which regulates the relationship between internal management and technology. This view organically combines the theories of the first two stages, focusing on the accumulation of knowledge in the firm, on technological innovation and technological improvement, and the coordination of technology and management. The formation of core competence brings an intangible advantage to the enterprise, which is usually difficult to be imitated and substitute. Scholars often use a vivid analogy to illustrate enterprise core competence, core products, end products, and the relationship between them. If an enterprise is compared to a large tree, the trunk and main branch are the core products, the smaller branches are the business units, the leaves, flowers, and fruits are the end products, and the root system is the core competence that provides nutrients, support, and stability (Figure 2.3).

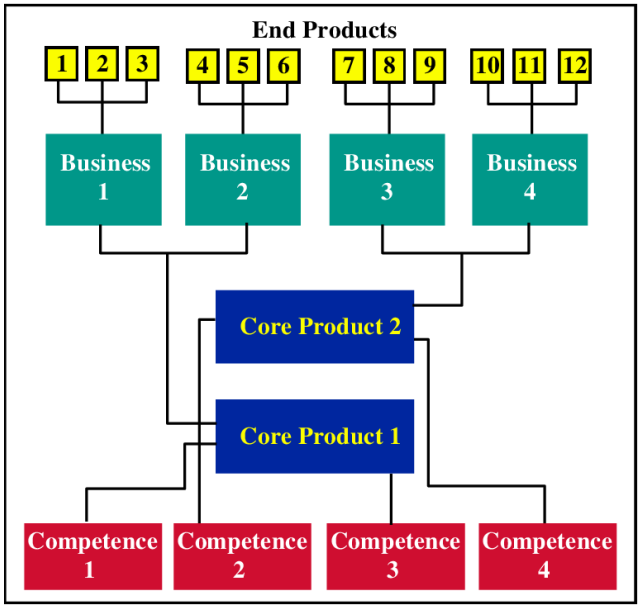

Figure 2.3 Competence: Source of competitiveness

Source: Prahalad and Hamel (1990)

Core competence is the first prerequisite for an enterprise to gain a competitive advantage. Cultivating core competence is not about investing more in R&D than competitors or integrating all industrial chains; instead, the actual core competence comes from collective learning within the organization, and it is formed through the transfer of experience and values within the organization as well as communication and cooperation among members within the organization. The competency-based school believes that the long-term advantage of an enterprise is based on competition at three levels core competence, core products, and end products. The significant difference between the competence-based and strategy schools is that the former focuses on studying competitive advantage from an internal perspective. The core competence theory breaks the "black box theory" and reveals the source of competitive advantage from the perspective of unique resources, knowledge, and capabilities. In addition, innovation of the core competence theory also lies in its proposition on how to formulate and implement corporate competitive strategies.

Since then, Teece et al. (1997) proposed the dynamic capabilities theory, which has received attention from academia as a new view of competence. Dynamic capabilities refer to a firm's ability to maintain or change its basic competitiveness, especially to make innovations in technology, products, and processes in the face of a rapidly changing external environment. The basic assumption of dynamic capabilities theory is that a firm can obtain sustained competitive advantage only when there is a dynamic balance between the firm and environmental changes. In contrast, dynamic capabilities are key to maintaining this dynamic balance. Therefore, the study of dynamic capabilities is based on two aspects. First, "dynamic" refers to the continuous self-renewal of the firm in order to adapt to the changes in the market environment. Second, "capability" is updating a firm's capabilities (absorb, integrate, and reconfigure organizational knowledge, skills, and resources) in its strategic management to adapt to environmental changes. These two points should be addressed by previous schools of strategic management theory. They are established based on Schumpeter's idea of creative destruction, which states that only through continuous learning, innovation, and the formation of a self-innovation mechanism, can a firm obtain a sustained competitive advantage. Table 2.1 summarizes the development of competence-related theories.

Table 2.1 Development of competence-related theories

Year	Representative researchers	Research focus	Relationship with a competitive advantage
1990	Prahalad and Hamel	Core competence	Core competence is the source of competitive advantage.
1991	Barney	Corporate resources and sustained competitive	Only enterprises with VRIN resources can have sustained competitive

		advantage	advantage.
1992	Langlois	Transaction cost economics	Enterprise capability is a source of competitive advantage.
1993	Foss	Enterprise theory: contract and competence	The evolution of corporate capabilities ensures the continuation of competitive advantage.
1993	Hamel and Heene	Core competence concept: competence-based competition	Competence-based theory of competition: core competence determines competitive advantage.
1997	Teece	Dynamic capabilities and strategic management	Enterprise dynamic capabilities are the source of competitive advantage and the guarantee of its enhancement.
2003	Winter	Operational and dynamic capabilities	Capabilities can be divided into operational and dynamic capabilities, closely related to competitive advantage.
2003	Helfat and Peteraf	Capability lifecycle	Capabilities have a temporal dimension.
2003	Zott	Cycle of capabilities	The cycle of capabilities is divided into three phases: change, selection, and retention.
2004	Brady and Davies	Project operational capabilities and dynamic capabilities	These capabilities are a prerequisite for the formation of competitive advantage.
2005	George	Learning capability and capability development	Continuous learning improves the company's comprehensive capabilities, and its competitive advantage will surface.

2.3.3 Development of dynamic capabilities

2.3.3.1 Emergence of dynamic capabilities

Dynamic capabilities were first used in system engineering. The concept of dynamic capabilities with strategic management significance was proposed by Teece et al. in 1990. It was first published in *Industrial and Corporate Change* in 1994, then revised by the authors and published in *Strategic Management Journal*, exerting a significant impact on academia and incurring extensive discussion. They argue that dynamic capabilities are "difficult to replicate and imitate, and can drive sustainable operation of the business," and dynamic capabilities "realize timely and rapid response to environmental changes by integrating, reconfiguring, and building relevant resources and capabilities." In 1997, Teece et al. proposed a strategic framework of dynamic capabilities, including factors of production, resources, organizational practices/capabilities, core competence, dynamic capabilities, and products (Teece et al., 1997).

Dynamic capabilities make sure that a company can dynamically adjust its core competence. These capabilities have no direct connection with establishing competitive advantages, but they can help the company constantly build new core competencies in the changing environment.

As a company's internal resources and capabilities are limited, it needs to integrate and absorb new external resources and capabilities to promote its competitiveness. The company shall select specific resources and capabilities to cultivate "superior capabilities" and then build "core competence" through the organic integration of several superior capabilities. New core competencies are continuously established through this process to respond to environmental changes.

The dynamic capabilities view is proposed based on questioning the resource-based view and core competence theory. The resource-based view and core competence theory emphasize that a firm's strategic resources and core competence are the sources of its competitive advantage. However, the key assumptions are proposed based on a static environment and will be invalid in a dynamic environment. In a dynamic environment, enterprises are forced to make qualitative changes to their capabilities continuously. Dynamic capabilities enable enterprises to quickly integrate, build and reconfigure internal and external resources, skills and abilities to establish new competitive advantages rapidly.

2.3.3.2 Definition of dynamic capabilities

(1) Definition of dynamic capabilities by environmental theory

According to Teece et al. (1997), dynamic capabilities are the abilities to integrate, build and reconfigure internal and external resources, and are the source for a company to find new sustainable competitive advantages in a constantly changing environment. "Dynamic" refers to the constant self-adjustment of a company in a changing environment. In contrast, "capabilities" refer to integrating and allocating internal and external resources to meet changing needs. Dynamic corporate development integrates, builds, and reconfigures internal and external forces to meet rapidly changing conditions. In addition, as one perspective of dynamic capabilities, "environmental theory" requires companies to adapt to changes in the external environment.

(2) Definition of dynamic capabilities by process theory

According to Eisenhardt and Martin (2000), dynamic capabilities are identifiable routines and processes. Dynamic capabilities refer to the dynamic integration of resources, the dynamic allocation of resources, and the acquisition and delivery of resources. Within a given period, companies shall change, select, and maintain a particular way of resource allocation. They believe that dynamic capabilities are a set of normative practices or processes that guide the development and evolution of corporate resources. It is a daily organizational process that has been integrated into the enterprise's resource reconfiguration, evolution and operation. The

dynamic nature of "process theory" requires continuous learning and absorbing sufficient information from outside sources.

(3) Definition of dynamic capabilities by innovation theory

Subbanarasimha (2001) illustrates dynamic capabilities from the perspective of immunology. In adaptive immunity, the antigen is the changes in the external environment, while the abilities to produce corresponding antibodies are the dynamic capability. Dynamic capabilities allow a company to constantly innovate its products or services in the changing environment, thus increasing its competitive advantage. The organizational transformation capability of a company is a process of constant search for new knowledge and innovation. The "innovation theory" requires companies to make innovations to increase their competitiveness and value continuously.

(4) Definition of dynamic capabilities by synthesis theory

Wang and Ahmed (2007) synthesize the above three perspectives and argue that dynamic capabilities refer to the continuous integration, reconfiguration, renewal, and re-creation of a company. More importantly, a company can enhance and reconfigure its core competencies through its unique resources to adapt to market changes and acquire and maintain sustained competitive advantage. Dynamic capabilities are not simply a process. Capabilities refer to the allocation of resources, especially the integration of external processes and internal resources. Therefore, capabilities have specific properties and develop over time with the interaction of various resources within a company (Amit & Schoemaker, 1993).

In summary, dynamic capabilities refer to the organization's ability to organize and reconfigure resources to adapt to changes in the external environment during its integration and configuration of resources and capabilities. Dynamic capabilities are the resources, capabilities, and knowledge systems accumulated by the organization in its long-term development, which can adapt to changes in the external environment, effectively integrate resources, build new core competencies, and provide high-quality products and services to meet market demands and improve performance.

The dynamic capabilities of an organization can be defined in four aspects: first, they involve organizational resources, knowledge system, and organizational processes; second, the capabilities are unique; third, they are imperfectly imitable by other companies; fourth, they can improve competitive advantage, survival capability and market advantage of the company.

2.3.4 Theoretical analysis models of dynamic capabilities

As an emerging theoretical school, the core idea of dynamic capabilities is to control the

company's internal and external resources and maintain the company's competitive advantage in the changing environment. In the identification and construction of dynamic capabilities, scholars usually adopt analytical paradigms and technical models, mainly including the strategic integration model proposed by Teece et al. (2014), the hierarchical classification model proposed by Winter (2003), and the organizational learning model proposed by Zollo et al. (2002). Other analytical models include Schreyögg and Kliesch-Eberl's (2007) dual-process model and Mintzberg's (1984; 1989) organizational transformation model.

(1) Strategic integration model of dynamic capabilities

Teece (2014) believe that dynamic capabilities are a mechanism of redistribution and integration of existing resources and capabilities and can adapt to a dynamic environment. Teece (2014) have expanded the original three elements (processes, positions, and paths) to the strategic integration model of "opportunity sensing, opportunity seizing, and strategic transforming." The traditional strategy integration model is further refined and elaborated in the study of dynamic performance. Teece et al. propose a new dynamic mechanism framework on this basis, namely, the dynamic evolution model consisting of static strategic factors (Figure 2.4).

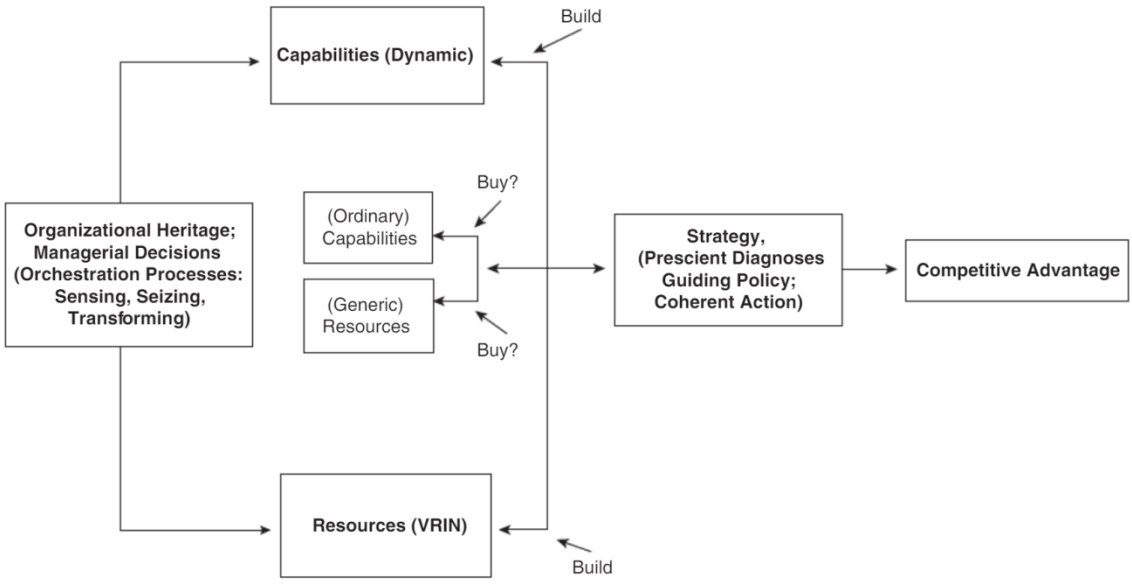

Figure 2.4 Logical structure of the dynamic capabilities paradigm

Source: Teece (2014)

In this structural analysis model, corporate values and cultural traditions are an essential basis for business decisions and are also significant to implementing corporate strategy and development. This is the basis for our analysis of the dynamic capabilities of joint disease hospitals in this thesis.

(2) Hierarchical classification model of dynamic capabilities

Collis proposed the concept of capability hierarchy in 1994 and argued that organizational capabilities could be classified into three kinds: the ability to perform basic operations, the ability to improve various operational activities dynamically, and the ability to outperform competitors and maintain a competitive advantage by recognizing and developing its potential. Based on this theory, Zollo and Winter established a dynamic capabilities hierarchy model. They classified the capabilities into the following levels: a firm's ability to engage in basic business activities (zero-level capability), adaptability (first-order capability), and innovation ability (second-order capability) (Zollo & Winter, 2002). Zollo (2003) focuses on the process of technological change and alteration of the resource structure, namely, the firm's adaptability (first-order capability). Based on evolutionary economics, Lavie (2006) analyzes the dynamic capabilities of firms and proposes a mechanism for businesses to reshape their capabilities. Cepeda and Vera (2007) divide organizational capabilities into operational and dynamic capabilities, the former being the zero-level capabilities and the latter being the higher-order capabilities. Companies tend to invest more in higher-order capabilities than lower-order skills to sustain their competitive advantage.

(3) Organizational learning model of dynamic capabilities

The critical premise of dynamic capabilities is the dynamic change of environment, namely, uncertainty. Zollo and Winter (2002) believe that organizational learning is the primary mechanism of organizational capability evolution. They divide the learning process into four processes generative variation, internal selection, replication, and retention. The learning process contains three interlocking mechanisms: experience accumulation, knowledge expression, and knowledge encoding. On the one hand, the organizational learning model of dynamic capabilities illustrates how an organization uses organizational learning to reconstruct organizational rules and integrate capabilities. On the other hand, it reveals that an organization can adapt to new models by self-regulation according to its rules (Figure 2.5).

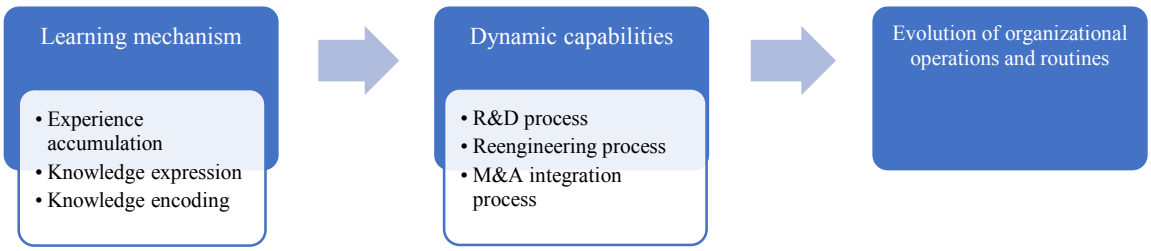

Figure 2.5 Organizational learning model of dynamic capabilities

2.3.5 Competitive advantage in a dynamic environment

How to effectively integrate resources and capabilities and create core competitiveness of enterprises in the market competition has become a common research problem for academia and business circles. The views mentioned above and theories explain a company's competitive advantage to some extent. However, they need to solve the problem of how a company can establish and sustain its competitive advantage under dynamic conditions.

Currently, the internal and external environments of companies in China are changing rapidly. The uncertain environment requires a dynamic response and further adaptation of the companies to the sources of their core competencies. Therefore, a company's competitive advantage lies not in whether it possesses specific core competencies but in whether its prediction of the environment can quickly integrate its core competencies with the changing market environment and adjust its internal system in the shortest possible time to support its core functions. The company's dynamic response, flexibility, and internal dynamic mechanism will lead to its dynamic behaviors. Through the dynamic adaptation of resources and capabilities, the company will transcend its traditional competitive advantages, seek and obtain new competitive advantages, and quickly adapt to the new environment to achieve sustainable development.

2.4 Development strategies of public hospitals

2.4.1 Key events in the development of public hospitals in China

The critical events in the development of China's public hospitals since the reform and opening up are shown in Table 2.2. The path of public hospital development in China shows that the government wants the public to enjoy equitably accessible, systematic, and continuous health services such as prevention, treatment, rehabilitation, chronic disease management, and health promotion so that everyone can enjoy essential health services and the effectiveness brought by health management. At the level of personalized needs, social forces should widely participate and take the initiative to provide targeted health services and products around different needs at different stages of the whole life cycle to meet the diversified, differentiated, and personalized health needs of the masses. At present, the high-quality development of public hospitals is a guiding policy of hospital development, which is aimed at promoting healthcare work to be goal-oriented, problem-oriented, demand-oriented, and effect-oriented, comprehensively deepening the healthcare system reform, constantly optimizing the practice environment,

improving the satisfaction of the general public, and contributing to the "Healthy China 2030" initiative.

Table 2.2 Key events in the development of public hospitals in China

Year	Chronicle of events
1977	Resumption of college entrance examination and the large-scale training of medical students in China's medical colleges and universities.
1980	The State Council approved the *Request for Instruction on the Issue of Individual Practice of Medicine*, and private hospitals began to emerge, breaking the monopoly of public hospitals.
1985	The State Council approved the *Report on Several Policies for Health Work Reform*, which expanded the autonomy of public hospitals.
1992	The State Council issued the *Opinions on Deepening Health Reform*, which requires public hospitals to "assist medical institutions with businesses"and "supplement the hospital revenue with sidelines" ,The healthcare industry began to enter a market-oriented stage.
1998	The State Council issued the Decision on the Establishment of a Medical Insurance System for Urban Employees, marking the entry of medical insurance in China, which began to become the primary source of revenue for public hospitals.
1999	*The People's Republic of China Law on Medical Practitioners* was officially implemented.
2000	The State Council issued the Guiding Opinions on the Reform of the Urban Health System to encourage restructuring various medical institutions and implementing "fully market-oriented" hospital reform.
2003	Due to the impact of SARS, the government has provided additional funds to public hospitals in order to uphold the public welfare nature of health care.
2005	The Shanghai Shenkang Hospital Development Center was established, and public hospitals began to explore the separation of government regulation and hospital management.
2009	The State Council issued *Opinions on Deepening the Reform of the Medical and Health Care System* to promote the reform of public hospitals, which kicked off the new round of medical reform; the former Ministry of Health issued the *Notice on Issues Related to Multi-sited Practice of Physicians*, which broke the monopoly of physician resources by public hospitals.
2012	The pilot program of separation of medicine and treatment was initiated, forcing public hospitals to stop the model of increasing hospital revenue by excessive sales of drugs, and the drug markup system began to be terminated; "Sanming medical reform" was launched.
2015	The State Council issued the *Guiding Opinions on Promoting the Construction of the Hierarchical Treatment System*, in which large public hospitals must implement hierarchical diagnosis and treatment. The number of outpatient visits declines significantly, and most patients are shifted to secondary or primary health institutions.
2016	The State Council issued the *Opinions on Integrating the Basic Medical Insurance System for Urban and Rural Residents*, which began to unify the medical insurance for urban and rural residents.
2017	Drug markups are eliminated, followed by medical service price adjustment policies.
2018	The National Health and Family Planning Commission was renamed the National Health Commission, and the National Healthcare Security Administration was established.
2019	The National Healthcare Security Administration issued *the Implementation Opinions of Nine Departments, Including the National Healthcare Security Administration, on the Extension of Pilot Zones for Centralized Drug Procurement and Usage* to promote centralized drug procurement and usage across China. The State Council Leading Group on Deepening Medical Reform issued the *Notice on Further Promotion of the*

	Experience of Deepening Medical Reform in Fujian Province and Sanming City, requiring all provinces to formulate work plans to promote Sanming experience in medical reform and deepen medical reform based on their actual situations.
2021	According to the Opinions of the General Office of the State Council on Promoting High-quality Development of Public Hospitals, the government decided to promote the high-quality development of public hospitals first in Shanghai, Jiangsu Province, and Zhejiang Province.

2.4.2 Development of public hospitals in China

According to the *2021 China Health Statistics Yearbook* (National Health Commission, 2021), by the end of 2020, there were 1,022,922 medical institutions in China, including hospitals (general hospitals, TCM hospitals), primary medical and healthcare institutions (community health service centers and health centers), specialized public health institutions (disease prevention and control centers, maternal and child health care centers) and other medical and health care institutions (sanatoriums, health supervision, and inspection institutions). There was a total of 35,394 hospitals nationwide, including 11,870 public hospitals (33.5%) and 23,542 private hospitals (66.5%), and the ratio of the two was about 1:2. There were 2,588 public tertiary hospitals, accounting for 21.8% of the whole public hospitals. There were 1,580 grade A tertiary public hospitals, including 853 general hospitals, 368 traditional Chinese medicine hospitals, 283 specialized hospitals, and 59 hospitals of integrated traditional Chinese and western medicine. The percentage of specialized hospitals and integrated traditional Chinese and western medicine hospitals was 17.9% and 3.7%, respectively. Compared with the figure in 2009, in 2020, the number of medical institutions increased by 11.6%, the number of public hospitals decreased by 24.5%, the number of tertiary hospitals increased by 106.5%, the number of grades A specialized tertiary hospitals increased by 108.1%, and the number of grades A tertiary hospitals of integrated medicine increased by 268.6%, as shown in Table 2.3.

Table 2.3 Overview of public hospitals in China

Hospital category	2009	2018	2019	2020
Public hospitals	15724	12032	11930	11870
Tertiary hospitals	1233	2263	2404	2588
Grade A tertiary hospitals	765	1442	1516	1580
Grade A tertiary specialized hospital	136	257	274	283
Grade A tertiary hospitals of integrated medicine	16	57	58	59

2.4.3 Significance of strategic management in public hospitals

(1) Strategic management promotes hospitals to follow the direction of medical reform

It is the fundamental principle and direction of the medical and healthcare system reform to realize the joint development of public and non-public medical institutions, with the former

taking the lead and accelerating the formation of a pattern with multiple hospital investors. As a result, public hospitals will face more significant challenges and competitive pressure. Therefore, public hospitals should seize the opportunities, maintain their strengths, make up for the weaknesses, reduce the threats, and make a holistic plan for their medium and long-term development. Only by adapting to the new situation of the current medical and health care system reform can public hospitals maintain stable development.

(2) Strategic management facilitates the transformation of public hospitals in the medical reform

With China's medical and healthcare industry's development and social and economic development, people's health awareness and medical needs are also increasing. In order to achieve a healthy and stable development, public hospitals are bound to transform. Therefore, they must formulate a comprehensive, systematic, and long-term plan for their development direction and value orientation, set reasonable development goals, and objectively summarize their problems and causes to avoid blindness and limitations in transformation. Strategic management can provide a framework for the hospital's change and development planning.

(3) Strategic management is conducive to improving the core competence of public hospitals

Core competence is the critical ability for hospitals to maintain a competitive advantage and achieve sustainable development. Hospitals must study the medical market, clarify the diseases and specialties in which they have an advantage, highlight their particular treatment technologies, provide patients with diversified treatment experiences and choices, and meet people's medical needs. Hospital strategic management can effectively help hospitals analyze internal strengths and weaknesses and external threats and opportunities, formulate corresponding strategic management decisions so that they can fully utilize their strengths and opportunities, avoid and make up for their weaknesses, and overcome difficulties that may be encountered in development and transformation. As a result, their operational efficiency and comprehensive strength will be improved, and their word-of-mouth and image will also be enhanced (Ren, 2015).

(4) Strategic management can improve the management level of public hospitals

Hospital administrators in China are often technical talents, so most hospitals are managed by experience. The lack of scientific management often leads to blindness and limitations in decision-making. Strategic management can help the hospital transform from empirical management to scientific management, from extensive management to standardization management, and from standardization management to delicacy management. Implementation

of strategic management in hospitals is also an opportunity for hospital administrators to enhance their management ability (Xu, 2016).

2.4.4 Overview of public specialized hospitals in China

In 2020, there were 338 million visits to specialized hospitals in China, up by 250 million compared with the figure in 2009, with an average annual growth rate of 25.5%. There were 18.205 million hospital admissions in 2020, up by 15.045 million compared with the figure in 2009, with an average annual growth rate of 43.3%. There were 1.258 million beds in 2020, up by 841,000 compared with the figure in 2009, with an average annual growth rate of 18.3%. The bed occupancy rate was 72.9% in 2020, 10.6% lower than in 2009. The average length of stay was 15.7 days in 2020, 1.3 days lower than that in 2009. With traditional Chinese medicine hospitals as an example, there were 5,482 traditional Chinese medicine hospitals in 2020, of which 535 were tertiary hospitals, accounting for 9.8%. Both public and private specialized hospitals have increased significantly in size in recent years, but the development is still significantly uneven in different regions (Table 2.4).

Table 2.4 Development of public specialized hospitals

	Unit of measurement	Year			
		2009	2018	2019	2020
Total number of beds	10,000 beds	41.7	105.4	115.8	125.8
TCM orthopedic hospitals		-	3.0	3.2	3.4
Total number of medical practitioners	10,000 people	42.4	100.9	108.9	116.5
TCM specialized Hospitals		-	5.5	5.8	6.3
Number of outpatient visits	10,000 person times	8,865.6	35,553. 5	38,588. 4	33,753. 3
Number of inpatient admissions		316.0	1,899. 6	2,023. 6	1,820. 5
Bed occupancy rate	%	83.5	81.3	80. 2	72.9
Average hospital stay	Days	17.0	14.3	14.3	15.7

2.5 Hospital development strategy based on dynamic capabilities

2.5.1 Connotation of dynamic capabilities of public hospitals

The dynamic capabilities of public hospitals refer to the abilities of hospitals to acquire and efficiently allocate healthcare resources, provide quality healthcare services, promote new technologies and businesses, build their brand value, and maintain and expand their strengths. The competence-based theory of the firm has been introduced in the healthcare industry for analysis of medical institutions. In their study of health service quality, Kerr and Trantow (1969) found that health service capability is based on needs, and they defined it from a goal-oriented

perspective, with the aim and outcome of health service capability meeting the needs of health services. Fraser and Greenhalgh (2001) defined health service capability from the perspective of potential for development, which is the ability to respond to changes, create new knowledge, continuously improve its performance, adapt to changes in the environment and keep updated, and continuously provide appropriate health services. This academic perspective is in line with the basic idea of dynamic capabilities. Epstein and Hundert (2002) defined the medical expertise of the medical staff from the perspective of core health services resources. The medical staff adopts means such as communication, knowledge, expertise, clinical inference, emotions, and values to serve the individuals and society. Most of the existing studies on hospital strategic development in China focus on competitiveness, performance evaluation, medical quality, and cost-effectiveness, needing more systematic research on dynamic capabilities. T. Chen et al. (2017) defined the dynamic capabilities of public hospitals as the rational use of theoretical knowledge and professional skills to carry out effective doctor-patient communication to meet the demands for medical services, as well as the provision of high-quality and efficient medical services to patients through continuous innovation to adapt to new demands.

Similarly, Zhang et al. (2019) defined the dynamic capabilities of public hospitals as the ability to maintain and develop competitive advantages by effective integration of internal and external resources and innovation to continuously respond to the dynamic demands of the health service market and the new competitive ecology, form core brand values and provide high-quality, efficient, and innovative health services. The dynamic capabilities of public hospitals aim to adapt to the health needs of the new era, while the core is to integrate hospital resources and technologies. In addition, they need to learn new medical knowledge and technologies and bring in talents to provide quality and efficient healthcare services.

2.5.2 Building and development of dynamic capabilities of public hospitals

Hospitals can achieve sustained competitive advantage and dynamic capabilities through continuous perception, integration, learning, and transformation. The four dimensions of "process" in the dynamic capabilities framework suggest ways to build competitive advantage in hospitals. In addition, some scholars also identify organizational flexibility as an essential indicator to evaluate the dynamic capabilities of public hospitals (Zhou & Li, 2006). An overview of the five principal dimensions of the dynamic capabilities of public hospitals is as follows.

(1) Perception and identification

Perception and identification capability refers to the ability of a hospital to identify and prevent potential hospital crises by promptly identifying and obtaining valuable or potentially valuable information related to hospital development in its interaction with various stakeholders (Fang et al., 2015). Public hospitals should regularly evaluate the factors of the policy environment, status quo, competing hospitals, new competitors, and "invasion of the foreign enemy" and view crises as opportunities to break through the hospital rigidity and achieve strategic innovation (Mu et al., 2014). To perceive and identify the dynamic capabilities of public hospitals, we must first collect and organize information from the external environment. In addition, we must make changes and innovations in public hospitals based on the uncertainties of the external environment, such as diversified policy changes, industrial structure evolution, the impact of medical informatization, penetration of intelligent healthcare and artificial intelligence, and transformation of industrial models (Lin & Su, 2012). The uncertain environment also improves the relationship and interaction between public hospitals and other healthcare organizations in the industry. The government should pay more attention to adjusting and reforming public hospitals' internal operations. Public hospitals should adhere to the values of "people-oriented and health-centered" and carry out process reengineering, structural reorganization, relationship restructuring, and value chain reconstruction.

(2) Change and innovation

The ability of an organization in change and innovation, is the process in which a public hospital spontaneously makes innovations to respond to crises and threats or develops new products and markets for new types of healthcare services based on the strategic and innovative positioning of the public hospital and with the maximized utilization of existing resources (X. L. Zhang & Qiu, 2010). Organizational change and innovation refer to the ability to reorganize existing hospital and external resources to effectively mobilize resources and rebuild new business in public hospitals under rapidly changing and unpredictable circumstances (H. J. Ma et al., 2015). As each hospital's internal and external environment varies significantly, public hospitals should develop transformation and innovation strategies suitable for their development in the uncertain external environment based on their actual situation and the theory of total quality management. Organizational transformation and innovation is a trial-and-error culture characterized by "action - identification of targets - action again, " and stable cross-cultural management, learning, trial-and-error, adaptation, system design, and organizational support are the critical factors for the innovative performance of the trial and error culture (Ning et al., 2016). Therefore, public hospitals should focus on developing organizational transformation and innovation capabilities and implement strategies and measures in practical

management to adapt to the changing external environment (Yun & Wang, 2015).

(3) Organizational learning

Organizational learning capability is a competence of the organization formed based on the long-term integration of individual learning capabilities. It is knowledge discovery, dissemination, absorption, application, creation, and an ability to adjust behavior according to new knowledge and long-term goals. Organizational learning capability is fundamental to the sustainability of public hospitals and directly brings new vitality to the hospitals. It often represents the sustainable development potential of public hospitals and is the source of innovative activities. The training and cultivation of medical workers, especially young medical students, by the national standardized training for residents continuously provides medical talents and teachers for hospitals, transforming the hospitals into teaching institutions and continuously improving their dynamic capabilities. In addition, the organizational learning capability is also reflected in the hospital's innovation and scientific research capabilities in the aspects of new technology, new business, patent and intellectual property reserve, and clinical and basic research.

(4) Integration and reconfiguration

Reconfiguration is the adjustment of the hospital's resources. The purpose of integration is to combine different parts to form an organic whole through coordination and organization to improve overall performance. According to Peng et al. (2008), the integration of public hospitals can be divided into internal integration, internal and external integration, and strategic integration. ① Internal integration. The administrative departments, clinical departments, and other hospital components are integrated into a new system. Hospital resources can meet current needs without changing the hospital's strategic plan and development direction. A good case in point is the multidisciplinary treatment (MDT) model.

Another example is the multidisciplinary team for enhanced recovery after surgery (ERAS) of total knee arthroplasty. ②Internal and external integration. Through a clear strategic plan and target positioning, public hospitals bring in external resources and capabilities to realize the integration of resources, information, and skills to meet the operational and innovation needs of the hospital. Through procurement and establishment of medical alliances, external resources and information are internalized into resources, capabilities, and knowledge that can be utilized to improve the hospital's competitiveness. Examples of internal and external integration include forming strategic alliances and establishing two-way referral systems with friendly hospitals, bringing the medical team to new disciplines and new technologies, upgrading the "Internet+"

program, introducing artificial intelligence-assisted treatment, and applying surgical robot systems. ③Strategic integration: Due to the uncertainty of the external environment, the establishment of new models and systems such as industrial interconnection, intelligent interconnection, global competition, and multilateral contracts has posed challenges to the sustainable operation of hospitals (C. H. Chen et al., 2018). Public hospitals cannot meet sustainable development needs relying on their original core competence alone. In a dynamic competitive environment, public hospitals must find development opportunities in the changing market and develop new strategies in the competition. For example, under the influence of COVID-19, public hospitals can open up online channels and offer telemedicine services to transform themselves into Internet-based hospitals. For another example, public hospitals can integrate wellness institutions to enter the health management industry in the context of population aging.

(5) Organizational flexibility

A flexible organization can adapt and respond relatively quickly to changes in its external environment to gain an advantage and sustain its competitive position (Xie et al., 2001). We can change the traditional organizational management model of the hospital and reform its institutional settings, management system, process design, and treatment skills to enhance its flexibility to adapt to the dynamic changes of the external environment. Building organizational flexibility in public hospitals should include establishing flexible leadership relationships, decentralizing decision-making, promoting horizontal communication, implementing a flat governance structure, and establishing learning organizations (Yao, 2005).

2.6 Theoretical model: propositions

Based on the above literature analysis, there are various understandings of dynamic capabilities in public hospitals, and there is still some controversy at the theoretical level. However, its attributes follow the model of "perception-integration-reconstruction," and there is no practical application of dynamic capabilities theory for joint disease hospitals. The author has therefore designed a theoretical model and propositions for the acquisition of competitive advantage in arthritis hospitals based on the dynamic capability theory model, as shown in Figure 2.6.

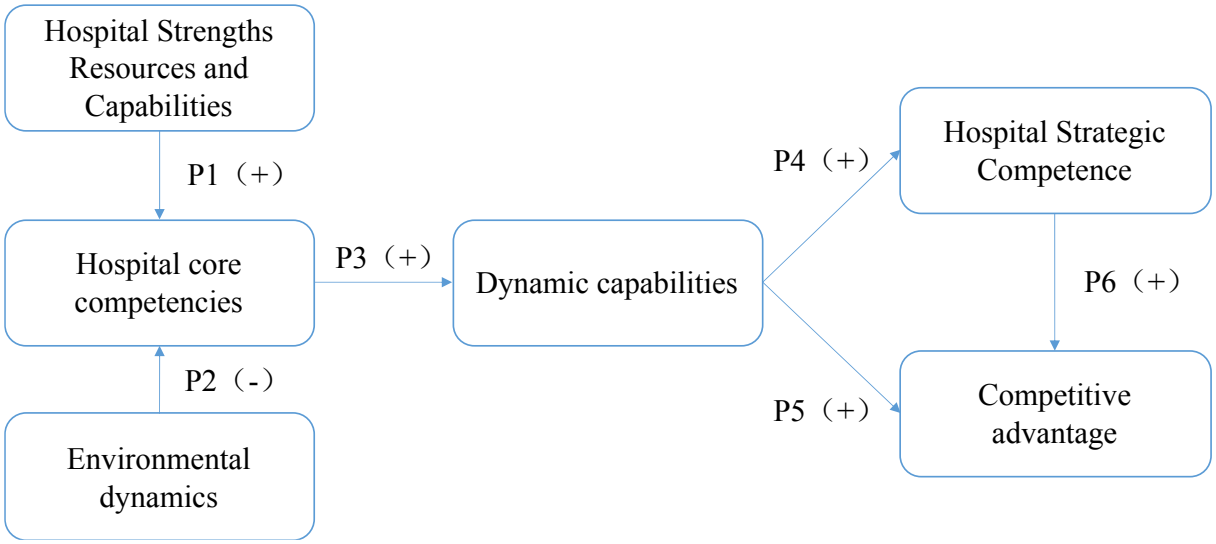

Figure 2.6 Theoretical model and propositions

Proposition 1: The more superior resource capabilities a hospital has, the stronger its core competitiveness.

Proposition 2: Hospital core competencies are strongly influenced by the dynamic nature of the environment

Proposition 3: The stronger the core competency of the hospital is conducive to the development of its dynamic capabilities

Proposition 4: The stronger the hospital's dynamic capabilities, the stronger the hospital's strategic capabilities

Proposition 5: The stronger the hospital's dynamic capabilities, the easier it is to gain a competitive advantage

Proposition 6: The stronger the hospital's strategic capabilities, the easier it is to gain a competitive advantage

2.7 Chapter summary

In response to the need to study the development strategy of arthritis-specialized hospitals based on dynamic capabilities, we systematically reviewed relevant fundamental theories in this chapter, focusing on the sources and development of dynamic capabilities. In addition, we reviewed the literature on the development of strategic management theory and competitive advantage. We analyzed the sources of competitive advantage and how to sustain long-term competitive advantage. Finally, we reviewed the development of public hospitals in China and elaborated on the current problems of public hospitals based on the development of specialized hospitals and arthritis hospitals. Dynamic capabilities focus on perceiving and identifying

environmental changes and continuously integrating and reorganizing resources while building advantageous capabilities to build core competencies in line with the market continuously. We also reviewed the literature on applying dynamic capabilities in the healthcare field. We analyzed the building and development of dynamic capabilities of public hospitals in terms of perception and identification, organizational transformation and innovation, integration and reconfiguration, organizational learning, and flexible management.

The development of public hospitals in China also needs to improve on problems such as consistency between development strategies and the new competitive model, imperfect hospital evaluation mechanism, unreasonable medical talent training system, and large scale but low overall quality of health resources. In the case of the specialty of arthritis, the current size of the specialties needs to meet the demands of patients for medical services, and there needs to be an explicit evaluation criterion for their core medical service capaci. With the acceleration of population aging and the increase of per capability. GDP in China, the Chinese people's demands for medical treatment will increase significantly. They will focus more on the quality of medical services, which requires hospitals to build more robust core competencies. The strength of hospital capabilities determines whether it can genuinely assume its responsibilities in delivering medical services, and the acquisition and maintenance of dynamic capabilities guarantee the sustainable development of public hospitals. Establishing a perfect evaluation system and strategic planning based on dynamic capabilities has excellent research value and significance for developing the arthritis specialty.

Chapter 3: Research Method

This chapter presents the main research methods, analysis, and approaches used to study development strategies for arthritis-specialized hospitals based on dynamic capabilities.

Qualitative and quantitative research are two primary social research methods that have been used and tested for a long time and have been further improved and developed in social research. They have apparent differences in epistemology, logical research process, theoretical foundation, and research methods, but they can complement each other to achieve the desired research goals.

Quantitative research examines and studies many things and uses mathematical tools to analyze things quantitatively. It expresses problems and phenomena in quantity and then analyzes, tests, and explains them to get the meaning. This research method stems from positivism, and standard quantitative research methods include field, experimental, analytical, and theoretical research. The commonly used mathematical modeling method is a type of theoretical research. Qualitative research involves gaining insight by uncovering problems, understanding events or phenomena, analyzing human behavior and perspectives, and answering questions. Qualitative research methods include the case study, interview, observation, Delphi, and focus group discussion (Guo, 2011). Strategic management research mainly adopts case studies, interviews, and questionnaires to measure dynamic capabilities (Bao & Long, 2015).

The concept of dynamic capabilities is relatively abstract. Some scholars have conducted systematic research on the connotation and dimensions of dynamic capabilities by developing scales and designing questionnaires, but the results are considerably different in different research subjects. Most current studies focus on enterprises, with few on public organizations, especially public hospitals or arthritis-specialized hospitals. The results of the previous studies may not apply to the building of dynamic capabilities of arthritis hospitals. For this study, the core question is that there are plenty of exploratory variables, and the relationship between these variables is complicated, so the case study approach is more appropriate for analysis. Second, the case study also supports multiple sources of data collection, including textual information, interview data, and quantitative data.

In summary, this study mainly adopts the case study method in the qualitative research

methodology. We organize expert interviews through the case study method and analyze the interview results to obtain expert consensus on the connotation and dimensions of dynamic capabilities. From the perspective of the development strategy of arthritis-specialized hospitals, the differences between the expert consensus and the current development strategy of Shanghai Guanghua Hospital are compared for further discussion and analysis to improve the development strategy of arthritis-specialized hospitals.

3.1 Case study

3.1.1 Case study flow chart

Figure 3.1 is the case study flow chart:

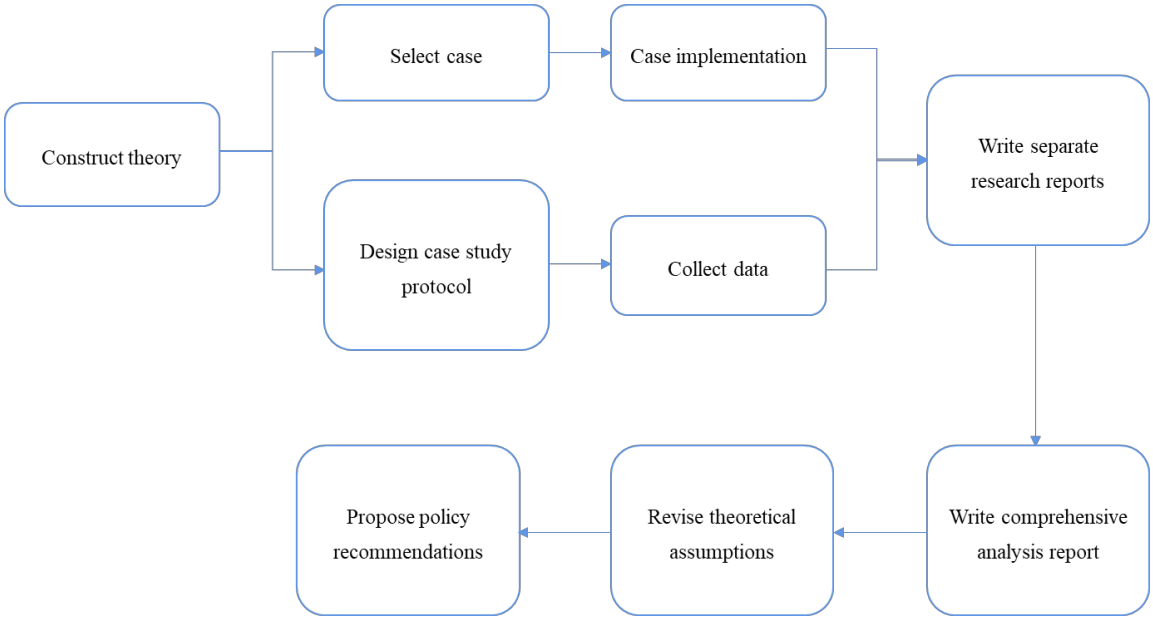

Figure 3.1 Case study flow chart

3.1.2 Preparations for case study

The preparation for a case study is divided into four steps: case study training, development of case study protocol, screening of research cases, and implementation of pre-experiments. Case study researchers must be well trained in the preparation stage, including four basic skills:

(1) To ask good questions, mainly open-ended questions related to the research topic;

(2) To be a good listener while capturing the interviewee's tone, expressions, and emotions;

(3) To capture the essence of the problem and summarize the interview in time to go deeper into the research topic;

(4) To be unbiased, accept the existence of conflicting views among interviewers, and refuse to

ask leading questions.

Ethical norms should be strictly followed when conducting case studies to protect the interviewees' privacy and industry confidentiality. This study has been reviewed and approved by the Ethics Committee of Shanghai Guanghua Hospital, and the ethical review acceptance number is 2022-K-80. The case study protocol includes the work content, procedures, and principles for implementing the case study.

3.1.3 Objectives of the case study

The objectives of this study are as follows. (1) How can dynamic capabilities provide a sustained competitive advantage for arthritis-specialized hospitals in an uncertain environment? (2) How do arthritis-specialized hospitals build and enhance dynamic capabilities? (3) How can arthritis-specialized hospitals update their resources and capabilities and rebuild their core competence to maintain a competitive advantage in a rapidly changing environment?

3.1.4 Data collection process

3.1.4.1 Case selection

This study focuses on building dynamic capabilities and developing strategic planning for arthritis-specialized hospitals to gain a competitive advantage and improve performance, so the following dimensions are considered in the selection of samples.

(1) Hospital positioning and scale: we mainly selected grade A tertiary hospitals with orthopedics (or orthopedic surgery) and rheumatology as the critical clinical specialties because the building of dynamic capabilities requires certain basic guarantees, if the hospital itself does not have VRIN resources or core competitiveness, it is impossible to integrate and reconfigure dynamic resources. Therefore, in this study, we select grade A tertiary hospitals with a distinctive specialty as the samples.

(2) Geographical characteristics: China is a vast country with different levels of economic development and different environmental conditions in different regions, and the preference for medical treatment, health needs, and disease spectrum of the patients also vary. According to the China Health and Retirement Longitudinal Study (CHARLS), there are significant geographic differences in osteoarthrosis among the elderly population in China. Therefore, we select public hospitals in different regions of China as the samples.

(3) Years of operation of the leading business: we select hospitals with provincial or national key clinical specialties of orthopedics (or orthopedic surgery) or rheumatology with

more than three years of operation to ensure that the main business of the hospital has been in a stable state of operation and the related organizational performance is relatively balanced.

(4) Characteristics of respondents in the hospitals: dynamic capabilities, as advanced capabilities of an organization, are related to hospital decision-making. Respondents should have a good understanding of the entire organization and the different levels of the organization and can make relatively accurate judgments about the hospital's decision-making behavior. In this study, we mainly select the president, members of the leadership team, or middle managers with a clinical professional background in the hospitals.

Based on the saturation of the data analysis, ten hospitals are finally selected as the cases for the focused analysis, including Henan Provincial Orthopedic Hospital (Zhengzhou Campus of Luoyang Orthopedic-Traumatological Hospital of Henan Province), The First Affiliated Hospital of Guangzhou University of Traditional Chinese Medicine, Xi'an Honghui Hospital, The First Affiliated Hospital of Xinjiang Medical University, West China Hospital of Sichuan University, The Ninth People's Hospital of Shanghai Jiao Tong University School of Medicine, Longhua Hospital affiliated to Shanghai University of Traditional Chinese Medicine, Xiangya Hospital of Central South University, Foshan Hospital of Traditional Chinese Medicine, and Shandong Wendeng Osteopathic Hospital. The ten hospitals are extensively distributed across China, including two in East China, two in Central China, two in South China, one in Southwest China, two in Northwest China, and one in North China, which cover the whole country and are geographically representative. The ten hospitals are all public, and all are graded A tertiary hospitals, which are the core components of public hospitals in China and represent the highest level of hospital and discipline development. The basic information about the hospitals where the experts work is shown in Table 3.1.

3.1.4.2 Data source

The research topic of this thesis is a development strategy for arthritis-specialized hospitals based on dynamic capabilities. A total of 12 authoritative experts were selected for the study, and the results of interviews with ten experts were compiled and analyzed according to the completeness of the interview content. The main interviewees are hospital and department managers, clinical experts, and scholars in arthritis. The basic personal information of the interviewed experts is shown in Table 3.2.

In addition to interview materials, textual materials such as news reports, media interviews, and journals and articles on hospital management of the authoritative experts were also included in the database for subsequent analysis.

Table 3.1 Basic information of the hospitals of the interviewees

Hospital	Level	Total beds	Specialty beds	Annual specialty hospital admissions	Annual specialty surgeries
Henan Provincial Orthopedic Hospital (Zhengzhou Campus of Luoyang Orthopedic-Traumatological Hospital of Henan Province)	Grade A tertiary	1500	1200	68,000	48,000
The First Affiliated Hospital of Guangzhou University of Traditional Chinese Medicine	Grade A tertiary	2200	200	7,000	3,500
Shaanxi Xi'an Honghui Hospital	Grade A tertiary	1600	1000	70,000	60,000
The First Affiliated Hospital of Xinjiang Medical University	Grade A tertiary	2700	250	11,000	7,000
West China Hospital of Sichuan University	Grade A tertiary	2150	200	15,000	6,000
The Ninth People's Hospital of Shanghai Jiao Tong University School of Medicine	Grade A tertiary	4300	400	13,000	13,000
Longhua Hospital affiliated to Shanghai University of Traditional Chinese Medicine	Grade A tertiary	1250	150	3,000	1,000
Xiangya Hospital of Central South University	Grade A tertiary	3500	324	8,000	7,000
Foshan Hospital of Traditional Chinese Medicine	Grade A tertiary	1300	1057	41,000	31,000
Shandong Wendeng Osteopathic Hospital	Grade A tertiary	1200	1000	25,000	19,000

Table 3.2 Basic individual information of the experts

Interviewee	Gender	Age	Working years	Professional title	Educational background	Major positions in work (including former positions)	Length of service in management	Date	Duration	Words
Expert A	Male	60	38	Professor	Undergraduate	Hospital director	Over 10 years	Nov. 4, 2022	100 min	23,886
Expert B	Male	51	23	Professor	Doctor	Laboratory chief, Department head	Over 10 years	Nov. 5, 2022	91 min	19,654
Expert C	Male	52	29	Professor	Doctor	Deputy hospital director	Over 10 years	Nov. 6, 2022	90 min	21,524
Expert D	Male	59	37	Professor	Undergraduate	Department head	Over 10 years	Nov. 8, 2022	82 min	17,480
Expert E	Male	46	17	Professor	Doctor	Department head	5-10 years	Nov. 10, 2022	83 min	17,781
Expert F	Male	71	45	Lifetime tenured professor	Undergraduate	Deputy hospital director	Over 10 years	Nov. 11, 2022	92 min	21,409
Expert G	Male	85	59	Lifetime tenured professor	Undergraduate	Deputy director of the health ureau, University president	Over 10 years	Nov. 13, 2022	105 min	12,177
Expert H	Male	52	22	Professor	Doctor	Hospital director	Over 10 years	Nov. 14, 2022	60 min	9,829
Expert I	Male	62	36	Professor	Master	Hospital director	Over 10 years	Nov. 15, 2022	72 min	13,524
Expert J	Male	65	40	Professor	Undergraduate	Hospital director	Over 10 years	Nov. 16, 2022	61 min	9,997

3.1.5 Overview of interview methods

This study intends to explore the link between the dynamic capabilities of a public hospital and its competitive advantage through the expert interview method to provide a reference for the strategic planning of arthritis-specialized hospitals. Interview methods can be broadly classified into structured, unstructured, and semi-structured interview methods, in which structured interviews are usually conducted using questionnaires or scales with directed standard procedures; unstructured interview methods refer to free interviews with non-directed and non-standardized procedures, and semi-structured interviews are in between structured and unstructured interviews and are more flexible compared to structured interviews. In semi-structured interviews, researchers often conduct interviews based on a predetermined outline that focuses on the research topic and core elements of the research. They may ask for more information on the essential items to obtain other critical information that the researcher needs to look into or cover. The interview outline sets standardized questions similar to those in a structured interview. Although the interviewer has some control over the interview structure, there is plenty of room for the interviewees to express their views and opinions. Moreover, the outlines for the interview can be adjusted at any time according to the progress of the interview.

In order to obtain maximum information for the study, this study intends to use a semi-structured interview format to conduct interviews with ten experts regarding the information on the influence of dynamic capabilities and development strategies of an arthritis-specialized hospital on the building of its competitive advantage.

3.1.6 Design of the interview outline

The purpose of the interview in this study is to obtain from these expert interviews the resources and capabilities most valued in the development of hospitals and disciplines and what development strategies are needed to support the building of hospital or disciplinary advantages. The interview outline of this study consists of three main parts. The first part is the basic situation of the respondent's organization, including the basic situation and business development level of the respondent's hospital/department, the development positioning and goals of the hospital/department, and the main challenges and problems facing the development of the hospital/department. The second part is the competitive advantage situation of the hospital/department, including the current competitive advantage and core competitiveness of the hospital/department, and the measures to update the core competitiveness following the

external environment. The third part is the capability of the hospital/department, mainly including the application of dynamic capabilities in hospital development strategy and specific measures of the hospital/department to build dynamic capabilities. The interview outline is presented in Appendix Ⅱ.

3.1.7 Interviewees and interview process

1. Selection of interviewees:

Key informants in the industry were invited to participate in the interview. We mainly invited discipline leaders in the field of arthritis as well as hospital leaders such as directors and deputy directors or mid-level leaders such as department heads in relevant hospitals. We followed the information saturation principle to determine the interview's sample size. According to the interview outline, the first interviewee was identified with the selection criterion of authorities who understand the industry's current situation and future development. With the constant comparative analysis method, we organized the information obtained from the first interviewee to determine whether the perspectives and directions of the information obtained were adequate. Based on the results, we measured the degree of information saturation. We adopted the maximum differentiation method to select the second interviewee, who would provide different directions or more information than the first interviewee. Since the second interviewee, the process mentioned above was repeated to select the following interviewees. If information saturation still needed to be met, we would interview the third or fourth person until the information was saturated. For interviewee feedback, if no new information was added, then the interview ended. We would continue adding respondents to confirm the information saturation level to ensure the comprehensiveness of information collection and increase reliability for subsequent analysis.

2. Interview process:

(1) Appointment of interview time with the interviewees: The interviewees were informed of the leading research topic of this study, and they would receive the interview outline after signing the informed consent form. Due to the influence of the COVID-19 epidemic, the interview would be conducted through the VooV Meeting of Tencent, and the interview time was proposed to be 60 to 90 minutes.

(2) Interview depth: The same principle of information saturation was followed. In other words, the interviewees were considered to have reached information saturation if they had nothing more to say about the questions in the interview outline.

3. Interview data collation:

The audio recordings were transcribed using software, and the interview data were then manually corrected by two researchers to revise the errors in machine transcription errors and remove statements that were not relevant to the study. The interviews were conducted from November to December 2022, with four researchers working jointly to collect and organize the data.

3.2 Data analysis

3.2.1 Data analysis tools

There is more than ten mainstream qualitative research analysis software, including Nvivo, MAXQDA, Atlas. Ti and Desoose. In this study, the qualitative research data analysis software Nvivo 11 Plus of QSR was used to manage and analyze the original interview data. Nvivo is more suitable than other software for the interview and textual data. The main functions of Nvivo are: (1) processing interview transcripts, literature content, textual content, images and videos, questionnaires, web content, and social media information; (2) quickly retrieving all data, automatically identifying keywords and themes in the data; and providing possible analysis ideas and directions; (3) automatically performing preliminary analysis and quick organization of data; (4) linking related contents to find the pattern of materials.

The workflow of Nvivo includes: (1) organizing the data; (2) manually coding to create nodes to code the interview data or other textual materials one by one; and (3) conducting searches, drawing hierarchical charts, word cloud diagrams, or matrix coding diagrams. By quickly analyzing the common elements in the materials, it helps the user classify and organize the information, allowing the researcher to process the materials efficiently and verify existing research hypotheses by analyzing the relationships between texts, concepts, and codes (Wen, 2014).

3.2.2 Data analysis steps

Data analysis is a crucial step in theory construction, and data analysis consists of both intra-case analysis and cross-case analysis. The intra-case analysis includes a detailed description of each case, using forms such as tables and figures or graphs to organize the data. The cross-case analysis involves analyzing and comparing data from various cases from multiple different approaches to overcome biases in information processing. There are three main methods of

cross-case analysis. The first is comparison according to category or dimension, which looks for similarities and differences between groups; the second is comparison according to pairwise grouped cases, which finds similarities and differences between each pair of cases; and the third is comparison according to the data source.

(1) Open coding

In order to understand the possible interlinked relationship between subject words, the three-stage coding approach of the Grounded Theory is used to organize and analyze the textual material. Coding is decomposing the collected or transcribed textual material, identifying the phenomenon, conceptualizing the phenomenon, and then abstracting, elevating, and synthesizing the concept into categories and core categories appropriately. The specific methods of the three-stage coding are as follows.

Open coding is the analytical work of the careful study of phenomena in order to name and classify them. It is also a generalization and comparison process to analyze, examine and conceptualize the data. It aims to discover conceptual categories from the data, name the category to determine the properties and dimensions, and then name and classify the phenomena. A category contains the properties and dimensions of a concept. In this study, we use keywords from the corpus of the interviewed experts as an open coding source.

(2) Axial coding

Axial coding is a complex process linking approximate codes together using constant comparison through deduction and induction. Its main task is to select and construct the content of the major categories and link the significant concept categories with the minor concept categories to reorganize the data. By merging the previously formed concept categories, researchers can identify and establish interrelationships between concept categories, such as causal, situational, functional, process, and sequential temporal relationships.

(3) Selective coding

The final stage of data analysis is called selective coding, where the main task is to boil down a “core category” among all named conceptual categories through integration and condensation. The core category is the keywords obtained by condensing all the analysis results, and these keywords are sufficient to describe the whole study. The categories and relationships developed at the first two levels of coding can be used to distill a core that summarizes the entire phenomenon and can be verified with data. Even if the conditions change and the presented phenomena differ, the keywords still have explanatory validity. After selective coding, a “storyline” can be developed.

3.2.3 Formulation of theories and propositions

Formulation of theories and propositions is an iterative process of comparison and testing. Through iterative comparisons within and between cases, the pieces of evidence in the theoretical framework and the cases are systematically compared, and the consistency of the framework and the cases is evaluated. In the iterative comparisons, theories that are highly consistent with the data are developed, and new findings in these data are fully utilized to conclude with empirical validity.

The first step is to develop the construct. The construct is the core concept obtained from multiple data analyses and repeated tests. Assurance of construct validity requires multiple (multi-subject, integrated qualitative and quantitative, multi-source, and multi-modal) data sources for corroboration.

The second step is to test whether the relationships between the constructs are consistent with the data in the individual cases. The test is conducted regarding the logic of the experiment.

3.2.4 Dialogue with the literature

Dialogue with the literature refers to comparing and analyzing existing concepts, hypotheses, and theories with the existing literature. Comparing literature with similar viewpoints allows otherwise unrelated phenomena to be linked through intrinsic similarities. More innovations and opportunities can be found by comparing the oppositions and contradictions between texts. Dialogue with the literature can determine the scope of application of research findings and obtain more substantial internal validity and theoretical generalizability, which can facilitate the popularization of theories (Liu et al., 2018).

3.2.5 Criteria for termination of a case study

The outcome of a case study can be a concept, a theoretical framework, a proposition, or simply a replication of an existing theory (McDonald & Eisenhardt, 2020). The criteria for termination of a case study depend on two main points: the timing to stop adding cases. Similarly, the core criterion is also information saturation. The information saturation test is generally used to determine whether the researcher can stop adding new cases. In other words, if the increment of information becomes extremely small after adding new cases, and the researcher cannot obtain new information from the new cases, it is time to stop adding new cases. In practice, one to two cases are usually added for verification after information saturation is identified, and the addition of new cases can be stopped when the information is saturated. Second, the timing to

terminate the repeated comparison of theory and data. When it is impossible to improve the theory further, the theory based on data comparison is relatively complete, and the comparison of data and theory can be stopped.

3.3 Strategic analysis methods

3.3.1 Overview of SWOT analysis methods

The SWOT analysis method is one of the most widely used strategic tools. It was first proposed in the 1980s by Professor Heinz Weihrich, a professor of management at the University of San Francisco. SWOT can quickly and effectively integrate the organization's internal and external competitive environment and competitive conditions to conduct a comprehensive analysis of its strengths (S), weaknesses (W), opportunities (O), and threats (T). The analysis is presented as a matrix that gives the organization an integrated view of its overall strategy (Mintzberg, 1990). Strategy makers have preferred the SWOT analysis due to its operability and feasibility. SWOT has only one purpose – to seek advantages and avoid disadvantages.

The SWOT analysis tool is widely applicable and is often used by managers of organizations in a brainstorming format to help identify and position the organization's capabilities and environment in each of the four matrix sections to make correct judgments and decisions (Hill & Westbrook, 1997).

3.3.2 Development of SWOT analysis

(1) Limitations of traditional SWOT analysis

Although SWOT remains one of the most common and popular tools for strategic analysis, there have been criticisms and comments on the traditional SWOT analysis. Its inability to analyze a company's internal environment in a relevant, comparative, and evolutionary manner and its lack of an open, heterogeneous, and differentiated approach to analyze the opportunities and threats in the external environment sometimes prevent companies from quickly and effectively integrating and reconfiguring their internal capabilities to adapt to the external environment (Vlados, 2019). In addition, traditional SWOT analysis is a qualitative analysis based on the managerial perspective that neglects the perspective of the customer group. Therefore, it may need to provide a practical and accurate assessment of the internal and external environment (Piercy & Giles, 1989; Wilson & Gilligan, 2009).

(2) Sustainable development of the organization

The primary responsibility of an organization is to maximize the positive impact of decisions and minimize their negative impact, thus shaping its brand and image. The organization's sustainable development requires it to address the contradiction in economic, environmental, and social issues at different levels. Recent studies have been emphasizing the importance of sustainability based on Industry 4.0, and some studies are directly based on the UN Sustainable Development Goalset (Braccini & Margherita, 2018; Diaz-Sarachaga et al., 2018; Duque et al., 2020; Pesonen & Horn, 2014; Phadermrod et al., 2019; Pizzi et al., 2020; J. Sachs et al., 2020; J. D. Sachs et al., 2019; Tirabeni et al., 2019). The same indicators in the complicated and ever-changing environment no longer regulate the market. Organizations should not seek to prioritize maximizing their profits at any cost. Instead, they must turn to sustainable management to undertake social responsibility and address customer expectations (Robbins & Judge, 2012; Robins, 2005).

(3) SWOT I analytical framework

The strategic management research team at ISCTE has made new adaptations to the traditional SWOT analysis and created the SWOT i analytical framework (shown in Figure 3.2), also known as the SWOT ISCTE school of business (Pereira et al., 2019). In SWOT i, values are placed at the center of strategy formulation, which forces us to consider values and their impact on society (Pereira et al., 2021). After a more rigorous analysis of the core of the organization's operating model, it is believed that organizational decision-making tends to be profit-oriented while ignoring the values.

In summary, the SWOT i analytical framework will be adopted to conduct a strategic analysis of Shanghai Guanghua Hospital. The hospital's values and social responsibility should be considered, sustainable development should be valued, and a patient perspective for hospital decision-making should be introduced. In the OT analysis, a macro environment approach (PEST analysis) is introduced to assess the hospital's external environment comprehensively.

Figure 3.2 SWOT I analytical framework

Source: Pereira et al. (2021)

3.4 Strategic adjustment of Guanghua Hospital of Integrated Traditional Chinese and Western Medicine and Focus group interview

As a qualitative research method, a focus group interview is a group interview rather than a one-to-one one. It is frequently used in marketing, political and social science research and is a method that has been stabilized in practice to study user experience. Focus means that the participants focus on one topic or one category of a topic to reveal the target users' experiences, feelings, attitudes, and desires in a structured way and endeavor to present the rationale objectively. The advantage of focus groups is to obtain a relatively large number of samples in a short period and analyze the focus issues from different perspectives.

The purposes of conducting focus group interviews in this study are as follows. First, in order to achieve a better application of theory in practice, the focus group interview will explore the specific measures to implement the strategies by the Shanghai Guanghua Hospital of Integrated Traditional Chinese and Western Medicine (from now on referred to as Guanghua Hospital), so that the measures can be closely integrated with the actual situation of the hospital. Second, as the middle managers are responsible for the specific implementation of the strategy, inviting them to conduct focus group interviews can ensure that the hospital strategy can be effectively implemented. To be specific, the author himself will act as the moderator to invite seven middle managers of Guanghua Hospital (as shown in Table 3.3), including the director of the administrative office, chief and associate chief physicians of the three preponderant

specialties of Arthrology, Joint Surgery, and Joint Rehabilitation, chief physician of the intensive care unit and the directors of the office of academic research and the office of teaching affairs. The experts had an in-depth discussion on the development strategy and subsequent planning of Guanghua Hospital.

Table 3.3 Participants of the focus group interview

Expert code	Gender	Age	Education	Job title	Length of service in management
GH1	Female	42	Master	Director of the Administrative Office	Over 10 years
GH2	Male	43	Doctor	Associate chief physician of the Department of Arthrology	5-10 years
GH3	Male	46	Doctor	Chief physician of the Department of Joint Rehabilitation	5-10 years
GH4	Female	44	Master	Director of the Office of Academic Research	Over 10 years
GH5	Female	45	Master	Chief physician of the Intensive Care Unit	Over 10 years
GH6	Female	42	Doctor	Director of the Office of Teaching Affairs	5-10 years
GH7	Male	45	Doctor	Chief physician of the Department of Joint Surgery	5-10 years

There are three topics for discussion as follows.

(1) With Guanghua Hospital as an example, the experts discuss its current core competence and dynamic capabilities in light of its actual situation.

(2) In its 1^{4t}h Five-Year Plan development strategy, what should Guanghua Hospital do to strengthen its dynamic capabilities and enhance its core competence to gain a competitive advantage?

(3) What are the desirable measures that can be carried forward, and what undesirable measures should be changed? How to carry forward and change the desirable and undesirable measures, and what are the resistance to implementation?

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Chapter 4: Field Study

4.1 Basic information of the case hospitals

4.1.1 Henan Provincial Orthopedic Hospital (Luoyang Orthopedic-Traumatological Hospital of Henan Province Zhengzhou Campus)

(1) Overview of hospital development and key disciplines

Luoyang Orthopedic-Traumatological Hospital of Henan Province (Henan Provincial Orthopedic Hospital) is a public grade A tertiary orthopedic TCM hospital integrating medical treatment, teaching, scientific research, industry, and culture. Under the direct jurisdiction of the provincial health commission, it is a national center for orthopedic diagnosis and treatment through TCM. Founded in 1956, the Henan Provincial Orthopedic Hospital opened its Zhengzhou Campus in 2014. It has more than 2,000 employees and more than 60 orthopedic-related clinical departments, with about 600,000 patient visits and 48,000 surgeries annually. The Zhengzhou Campus is planned to include 1,500 beds, of which 600 have been used in the first-stage construction. With a construction area of 67,600 square meters, it receives a total investment of about 500 million yuan from the government. Pingle Guo's Orthopedics is one of China's intangible cultural heritage and has been awarded "China Time-honored Brand" and "Famous Trademark of China." It is also selected as a representative project of the national intangible cultural heritage.

It has four national critical clinical specialties, includeding Orthopedics, Rehabilitation, Rheumatology, and Nursing; six national key TCM specialties, including Orthopedics, Rehabilitation, Rheumatology, Nursing, Massage, and Oncology; and two key disciplines of the National Administration of Traditional Chinese Medicine including Orthopedics of Traditional Chinese Medicine, and Clinical Pharmacology of TCM.

(2) Scale and level of orthopedics and sub-specialties

The Orthopedics Department of Zhengzhou Campus has 36 related departments, including Minimally Invasive Spine Surgery, Spine Surgery (5), Osteoarthrosis (2), Knee Surgery (3), Hip Surgery (2), Artificial Joint Revision, and Foot and Ankle Surgery (3). There are about 360 specialist physicians and 600 beds.

4.1.2 The First Affiliated Hospital of Guangzhou University of Chinese Medicine

(1) Overview of hospital development and key disciplines

The First Affiliated Hospital of Guangzhou University of Chinese Medicine is a large comprehensive Chinese medicine hospital founded in 1964. It was approved to set up the Guangdong Clinical Research Institute of Chinese Medicine in 2015, which is one of the essential bases of higher clinical education, medical treatment, and scientific research of Chinese medicine in China. It is among the first batch of grade A tertiary Chinese medicine hospitals in China, the first batch of famous Chinese medicine hospitals in Guangdong Province, and critical hospitals of high-level development in Guangdong Province. It is the national clinical research base of Chinese medicine, the clinical research base of Chinese medicine for Guangdong Province, the Lingnan Medical Research Center of Guangzhou University of Chinese Medicine, and the critical Chinese medicine hospital of the national Chinese medicine inheritance and innovation project. It is also a base for significant epidemic rescue and treatment. The hospital covers a floor area of 50,940 square meters, with a construction area of 188,000 square meters. It has 2,200 hospital beds and 46 clinical departments, with annual outpatient and emergency visits of 2.8 million person-times and 77,000 inpatient admissions.

It has seven national key clinical specialties: Endocrinology Department, Otorhinolaryngology Department, Orthopedics Department, Spleen, and Gastroenterology Department, Gynecology Department, Oncology Department, and Clinical Pharmacy, and fourteen critical specialties of the National Administration of Traditional Chinese Medicine: Emergency Department, Endocrinology Department, Otorhinolaryngology Department, Orthopedics Department, Oncology Department, Gynecology Department, Cardiovascular Department, Acupuncture and Moxibustion Department, Spleen and Gastroenterology Department, Encephalopathy Department, Rheumatology Department, Critical Care Medicine, Nursing, and Clinical Pharmacy.

(2) Scale and level of orthopedics and sub-specialties

The hospital has an orthopedic injury center divided into five wards. It has 62 specialists, 200 beds, and about 3,800 surgeries annually. The scientific achievement “Clinical Research on Treatment of Femoral Head Necrosis Through Integrative Medicine” has won the Second Prize for National Science and Technology Progress. The department is the treatment center for hip and joint disease in Chinese medicine.

4.1.3 Shaanxi Province Xi'an Honghui Hospital

(1) Overview of hospital development and key disciplines

Established in 1911, Shaanxi Province Xi'an Honghui Hospital is the earliest public hospital in Xi'an. With 1,600 beds, 28 orthopedic sub-specialties, and 49 clinical departments, it is a grade-A tertiary general hospital integrating medical treatment, education, research, and rehabilitation. It has three hospital campuses (the main campus, the Yanliang campus, and the high-speed railway station new town campus under construction with 3,000 beds).

It has two national critical clinical specialties: the Department of Orthopedics and the Department of Chinese Medicine Rehabilitation.

(2) Scale and level of orthopedics and sub-specialties

In orthopedics, there are five specialized hospitals within the Honghui Hospital: the Spine Surgery Hospital, the Joint Surgery Hospital, the Traumatic Orthopedic Hospital, the Rehabilitation hospital, and the Children's Orthopedic Hospital. There are three treatment centers: the Hand Surgery Center, the Sports Injury Center, and the Foot and Ankle Surgery Center. It has 266 specialist physicians, 1,000 orthopedic beds, more than 860,000 annual outpatient visits, and more than 60,000 annual surgeries. It ranked first in the 2019 China's Hospital Rankings (Specialty Reputation) released by the Hospital Management Institute of Fudan University in orthopedics in Northwest China.

4.1.4 The First Affiliated Hospital of Xinjiang Medical University

(1) Overview of hospital development and key disciplines

The First Clinical Medical College of Xinjiang Medical University, founded in 1956, is one of the 156 key construction projects in the first Five-Year Plan of China. It is a large comprehensive hospital integrating medical treatment, teaching, scientific research, prevention, and management. It is one of the most significant grade-A general tertiary hospitals in Xinjiang Uygur Autonomous Region. The hospital covers a total construction area of 341,900 square meters, with 2,970 open beds. It has 4,978 employees in service, with 74,000 inpatient surgeries and more than 150,000 discharges in 2019.

It has six national key clinical specialties: the Department of Endemic Diseases, Nursing Specialty, Department of Anesthesiology, Department of General Surgery, Department of Cardiovascular Medicine, and Department of Oncology.

(2) Scale and level of orthopedics and sub-specialties

The orthopedic center and sub-specialties include the Department of Traumatology,

Department of Joint Surgery, Department of Sports Injury, and Department of Microprosthetic Surgery. It has 40 specialists, 250 beds, and an annual surgical volume of more than 7,000 cases.

4.1.5 West China Hospital of Sichuan University

(1) Overview of hospital development and key disciplines

West China Hospital of Sichuan University (West China Hospital), founded in 1892, is a national center for treating complex and critical illnesses in western China. It is a grade A tertiary hospital. With a floor area of more than 384,666 square meters and a construction area of about 580,000 square meters, it has two additional campuses, 4,300 beds, and 48 clinical departments. In 2021, it had 7.75 million outpatient and emergency visits, 283,000 discharges, and 196,000 surgeries. The hospital has ten national and 31 provincial and ministerial innovation and research platforms, including the State Key Laboratory of Biotherapy, the 2011 Collaborative Innovation Program, the National Major Science and Technology Infrastructure for Translational Medicine in Biotherapy, the National Clinical Medical Research Center for Geriatric Diseases, and the National Precision Medicine Industry Innovation Center.

It has nine vital national disciplines, two key cultivation disciplines of the Ministry of Education, and 34 national key clinical specialties.

(2) Scale and level of orthopedics and sub-specialties

The Department of Orthopedics has six wards of Trauma Surgery, Joint Surgery, Spine Surgery, Foot and Ankle Surgery, Sports Medicine, and Bone Oncology, with 93 specialists, 400 beds, and an annual surgical volume of more than 13,000 cases. There are 200 beds in Joint Surgery, with an annual surgical volume of more than 6,000 cases. It ranked sixth in 2020 China's Hospital Rankings (Specialty Reputation) in orthopedics.

4.1.6 The Shanghai Ninth People's Hospital

(1) Overview of hospital development and key disciplines

The Shanghai Ninth People's Hospital (SNPH), affiliated with the Shanghai Jiao Tong University School of Medicine, was established in 1921. It was renamed Shanghai Ninth People's Hospital in 1952 and officially became the Ninth People's Hospital affiliated with Shanghai Second Medical University in 1964. In 2005, with the official merger of Shanghai Second Medical University and Shanghai Jiao Tong University, the hospital was renamed Shanghai Ninth People's Hospital of Shanghai Jiao Tong University School of Medicine. In 2014, Shanghai Ninth People's Hospital of Shanghai Jiao Tong University School of Medicine

and Shanghai Third People's Hospital of Shanghai Jiao Tong University School of Medicine (formerly Baosteel Hospital, a general tertiary hospital) were integrated with resources and unified in management. It covers a total floor area of 127.9 mu and a total construction area of 250,000 square meters. It has a total of 2,150 authorized beds and 1,000 comprehensive dental chairs. There are 64 clinical departments, 11 medical laboratories, and 4,846 employees.

It has one national oral medicine center, one national clinical medical research center for oral diseases, three national key disciplines: Oral Clinical Medicine, Plastic Surgery, and Orthopedics, one national key cultivation discipline: primary oral medicine, no national key clinical specialties: Orthopedics, Oral and Maxillofacial Surgery, Endodontics, Periodontics, Restorative Dentistry, Ophthalmology, Plastic Surgery, Orthodontics, and Oral Mucosal Disease, and eight Shanghai critical clinical specialties.

(2) Scale and level of orthopedics and sub-specialties

The Department of Orthopedics has five wards, 400 beds, 62 specialist physicians, and an annual surgical volume of 6,000 cases. It has one academician from the Chinese Academy of Engineering and three chief scientists from the National Key Research and Development Program. It was nominated in the 2020 China's Hospital Rankings (Specialty Reputation) in terms of orthopedics.

4.1.7 Longhua Hospital affiliated with Shanghai University of Traditional Chinese Medicine

(1) Overview of hospital development and key disciplines

Founded in 1960, Longhua Hospital, affiliated with the Shanghai University of Traditional Chinese Medicine, is one of China's first four earliest-built TCM clinical centers. It is a national demonstration TCM hospital and a grade A tertiary hospital integrating medical treatment, teaching, and scientific research. In 2018, it passed the JCI (Joint Commission International) accreditation and became the first TCM hospital certified as a JCI Academic Medical Center. The east and west campuses cover a total area of 51953.33 square meters, with 1,250 authorized beds, 48 clinical departments, seven medical laboratories, more than 4.05 million annual outpatient and emergency visits, and more than 63,000 annual discharges. It has two masters of traditional Chinese medicine, forty instructors for the succession of the academic experience of famous Chinese medicine practitioners, one chief scientist of the National 973 Program, three Chang Jiang Scholars, one chief scientist of the Qi Huang Project, three Qi Huang Scholars, and thirty-two famous Chinese medicine practitioners in Shanghai.

It has three national key disciplines, nine critical disciplines of the National Administration

of Traditional Chinese Medicine, three regional TCM treatment centers of the National Administration of Traditional Chinese Medicine, six national critical clinical specialties, thirteen key specialties of the National Administration of Traditional Chinese Medicine, one critical area innovation team of the Ministry of Science and Technology, one innovation team of the Ministry of Education, seven key clinical specialties in Shanghai, eight clinical specialties (diseases) of TCM in Shanghai, four clinical medical centers in Shanghai, and one "top-priority" key medical discipline in Shanghai.

(2) Scale and level of orthopedics and sub-specialties

The Department of Orthopedics has 150 beds, 16 specialist physicians, and three specialized treatment groups for spine, trauma, and joints, with more than 70,000 outpatient visits and more than 1,000 discharges.

4.1.8 Xiangya Hospital of Central South University

(1) Overview of hospital development and key disciplines

Xiangya Hospital of Central South University was founded in 1906 as Yale Hospital by Edward H. Hume (1876-1957). In 1914, Yale Hospital was renamed Xiangya Hospital. It is the affiliated hospital of Central South University, directly under the Ministry of Education. It is a grade A general tertiary hospital under the direct control of the National Health Commission. Covering a total construction area of 510,000 square meters, it has 3,500 authorized beds, with 3,473,000 outpatient and emergency visits, 160,000 hospital discharges, and 102,000 surgeries in 2021. It has 111 clinical and technical departments, sub-specialties, and 77 wards. There are 4,902 professional and technical personnel, one academician of the Chinese Academy of Engineering, 47 recipients of national talent programs, two national teaching masters, seven young and middle-aged experts with outstanding contributions recognized by the National Health Commission, 69 professors receiving special allowances from the State Council, and 11 candidates of the new century outstanding talent support program of the Ministry of Education.

It has seven vital national disciplines: Neurology, Neurosurgery, Dermatology, Orthopedics, Respiratory Medicine, General Surgery, and Burns, and 25 national key clinical specialties.

(2) Scale and level of orthopedics and sub-specialties

The Department of Orthopedics has six sub-specialties: Spine Surgery, Joint Surgery, Orthopedic Trauma, Hand Microsurgery, Orthopedic Disease Specialty, and Foot and Ankle Surgery. It has 73 specialists, 324 beds, 180,000 annual outpatient visits, and more than 8,000 surgeries.

4.1.9 Foshan Hospital of Traditional Chinese Medicine

(1) Overview of hospital development and key disciplines

Founded in 1956, the Foshan Hospital of Traditional Chinese Medicine is a grade A tertiary large Chinese medicine hospital integrating medical treatment, teaching, research, and rehabilitation. It is a member of the International Emergency Rescue Center Network and the China Trauma Rescue Alliance. The hospital comprises the headquarters, Sanshui Hospital, Chancheng High-tech Zone Hospital, Nanshan Hospital, Gaoming Hospital, Sanshui South Central Hospital, and one large preparation center. The hospital headquarters covers a floor area of 32,000 square meters, with a construction area of 170,000 square meters. In 2010, the new preparation center was put into operation, with a floor area of 63,000 square meters and a construction area of about 14,000 square meters. With 2,757 open beds and 1,957 professional and technical personnel of various types, the hospital reports over 5,224,400 outpatient and emergency visits, nearly 104,600 discharges, and more than 61,700 surgeries in 2019. The headquarters has 49 clinical departments and ten medical laboratories. It has two national TCM secondary laboratories and 116 specialized outpatient clinics. The hospital assets amount to 3 billion, including 1.7 billion in fixed assets. The hospital has 24 dosage forms with 113 varieties, including 19 with 102 varieties of pure Chinese medicine preparations. Its output value exceeded 100 million yuan in 2019.

It has one national critical clinical specialty: the Department of Orthopedics, and four key specialties of the National Administration of Traditional Chinese Medicine: the Department of Orthopedics, Department of Encephalopathy, Department of Diabetes, and Department of Oncology.

(2) Scale and level of orthopedics and sub-specialties

The Department of Orthopedics has 17 independent accounting units, including the 1st Department of Orthopedics (Spine Surgery), the 2nd Department of Orthopedics (Hand surgery and Microsurgery), the 3rd Department of Orthopedics (Pediatric Orthopedics), the 4th Department of Orthopedics (Traumatic Orthopedics), the 5th Department of Orthopedics (Tuina), the 6th Department of Orthopedics VI (Traumatic Orthopedics), the 7th Department of Orthopedics (Traumatic Orthopedics), the 8th Department of Orthopedics (Foot and Ankle Surgery), the 9th Department of Orthopedics (Joint Surgery), the 10th Department of Orthopedics (Joint Surgery), the 11th Department of Orthopedics (TCM Traumatic Orthopedics), the 12th Department of Orthopedics (TCM Traumatic Orthopedics), the 13th Department of Orthopedics (TCM Traumatic Orthopedics), the 14th Department of Orthopedics (Orthopedic

Disease Specialty), the 15th Department of Orthopedics (Sports Medicine), Department of Comprehensive Orthopedic Injury, and Department of Rehabilitation. It has 1,057 beds, 784 specialized technical personnel of intermediate level or above, and 26 orthopedic techniques in Chinese medicine, with 40,600 hospital discharges, 31,000 annual surgeries, and 669,900 outpatient visits in 2019. It was awarded the "Famous Chinese Medicine Department" title by the Orthopedic and Traumatology Branch of the China Association of Chinese Medicine in 2008. In 2017, it was selected as one of "the Top Departments in Hospitals in Guangdong Province."

4.1.10 Shandong Wendeng Osteopathic Hospital

(1) Overview of hospital development and key disciplines

Founded in 1958, Shandong Wendeng Osteopathic Hospital is a grade A tertiary orthopedic hospital with 1,200 open beds, more than 1,300 employees, more than 300,000 annual outpatient visits, and 26,000 inpatient visits. It is the national medical center of Chinese medicine orthopedics, the national fundamental discipline construction unit, and the leading unit of three dominant diseases of the National Administration of Traditional Chinese Medicine. Its Yantai campus covers an area of 266,666 square meters, with a total of 2,000 beds. The first-phase construction has an investment of 1.5 billion yuan, with a built-up area of 200,000 square meters. It was used in 2019, with more than 600 beds, 100,000 annual outpatient visits, and 15,000 annual surgeries. The hospital has more than 600 medical and nursing professionals and management staff.

It has one fundamental national specialty: TCM Orthopedics and one critical specialty of Chinese medicine in the 13th Five-Year Plan of Shandong Province: TCM Orthopedics.

(2) Scale and level of orthopedics and sub-specialties

The Yantai campus has seven orthopedic-related departments, more than 70 specialist physicians, more than 300 beds, and an annual surgical volume of 7,000 cases. There are nine departments related to osteoarthrosis: Department of Spinal Cord Surgery, Department of Osteoarthrosis, Department of Sports Medicine, Department of Trauma Osteopathy, Department of Extremity Trauma, Department of Emergency Trauma, Department of Foot and Ankle Surgery, Department of Pediatric Orthopedics, and Department of Bone and Hand Microsurgery. There are more than 1,100 professional and technical personnel, 1,000 beds, and 19,000 surgeries annually. The Department of Joint Surgery has three wards and 180 beds, with 1,200 surgeries per year.

4.2 Analysis of the interview data

This study used NVivo 12 Plus to organize and analyze the data. The qualitative materials of this study mainly consisted of in-depth interviews with middle and senior management of the ten case hospitals, and textual materials such as news reports and media interviews of authoritative experts as well as journals and academic articles on hospital management.

4.2.1 Coding

Coding refers to decomposing the collected or transcribed textual information, identifying phenomena, conceptualizing phenomena, and then re-abstracting, elevating, and synthesizing them into categories and core categories appropriately. Naming concepts enables the researchers to group similar events, instances, and things under a standard heading or classification.

After importing the interview data and other text data, the contents and events related to the core competence of the arthritis hospitals, hospital development status, strategic adjustment, discipline construction, dynamic capabilities, hospital culture, and hospital performance are manually coded one by one. The statements are selected to set corresponding nodes with auxiliary description information provided.

4.2.2 Three-level coding

The interview data were coded and sorted in three stages using NVivo 12 Plus as shown in Table 4.1 and Figure 4.1.

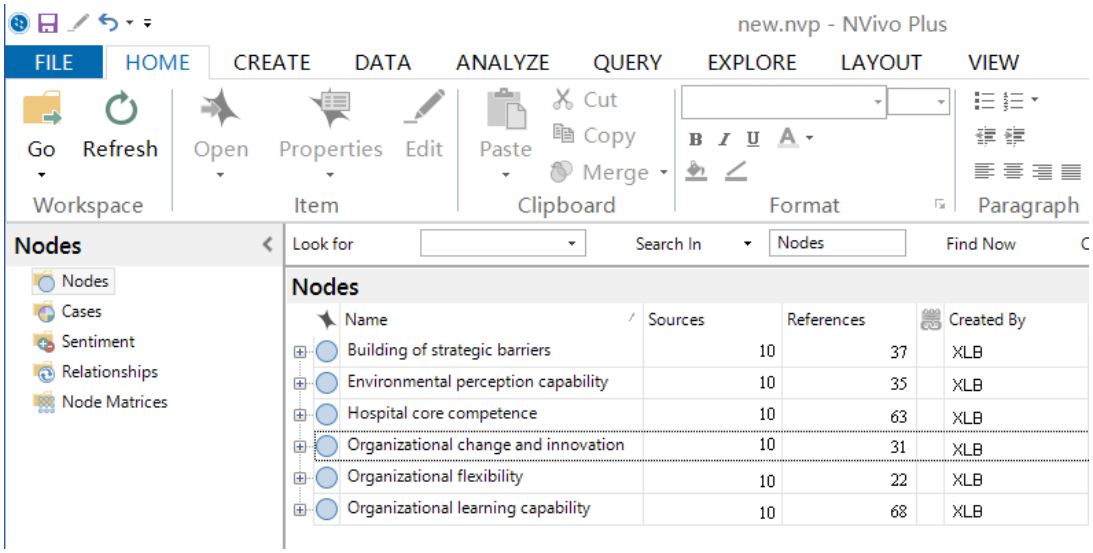

Figure 4.1 Computer screenshot of the interview material coding nodes

Table 4.1 Three-level coding analysis of the qualitative materials in this study

Open coding	*Axial coding*	*References*
Environmental perception capability	Regular assessment of changes in patient needs Regular focus on the development of new medical technologies Up-to-date knowledge of the national policy orientation in medical reforms Regular analysis of the development of regional competitors Regular focus on the development of supply chain companies of arthritis	35
Organizational learning capability	Medical business learning within the hospital Cross-hospital academic exchange Emphasis on standardized and specialized training and assessment of physicians Further study at home and abroad	68
Organizational change and innovation capability	Segmentation and integration of orthopedics sub-specialties Incentives for scientific research innovation Encouragement of application of new technology and development of new business Building of a culture of innovation and change	31
Organizational flexibility	Establishment of specialty alliances Dynamic optimization of hospital structure and system Flattening of management structure Mobilization of the initiative of employees	22
Building of strategic barriers	Breaking of the limits on technological exchange in neighboring regions Strengthening of the protection of intellectual property rights Avoidance of the brain drain of disciplinary leaders Continuous innovation in medical technology	37
Hospital core competence	Establishment of hospital brand Improvement of patient satisfaction Medical quality Preponderant disciplines Talent echelon Scientific research innovation Operational efficiency Hospital brand Hospital culture	63

4.2.3 Formation of preliminary theory

This study uses the Grounded Theory for theory building to uncover the in-depth connections behind the qualitative information and provide a basis for subsequent research through step-by-step induction and analysis. In this study, the researcher uses a bottom-up inductive analysis path to establish connections through nodes and uses the three-level coding approach to focus the qualitative material on five sub-dimensions of dynamic capabilities, which are

environmental perception capability, organizational learning capability, organizational change and innovation capability, organizational flexibility, and building of strategic barriers. In addition, the qualitative material also focuses on the composition of the hospital's valuable resources, capabilities, and core competence. Analysis of the path to formulating the development strategy of the arthritis hospitals constitutes the subsequent discussion in the case study.

4.3 Case analysis

4.3.1 Analysis of environmental perception capability of arthritis hospitals

This research project aims to study how public hospitals pay attention to changes in the healthcare environment and identify vital businesses and directions for future development in a dynamic and changing environment. In an uncertain environment, hospitals' primary task is to assess changes in the environment regularly. Environmental perception and identification are the first steps in building dynamic capabilities. For arthritis hospitals, the five aspects of changing patient needs, national policy orientation in the medical reforms, new medical technology development, development of regional competitors, and development of relevant stakeholders in arthritis are the elements that reflect changes in the external environment. The project map of the node of environmental perception capability drawn by NVivo is shown in Figure 4.2.

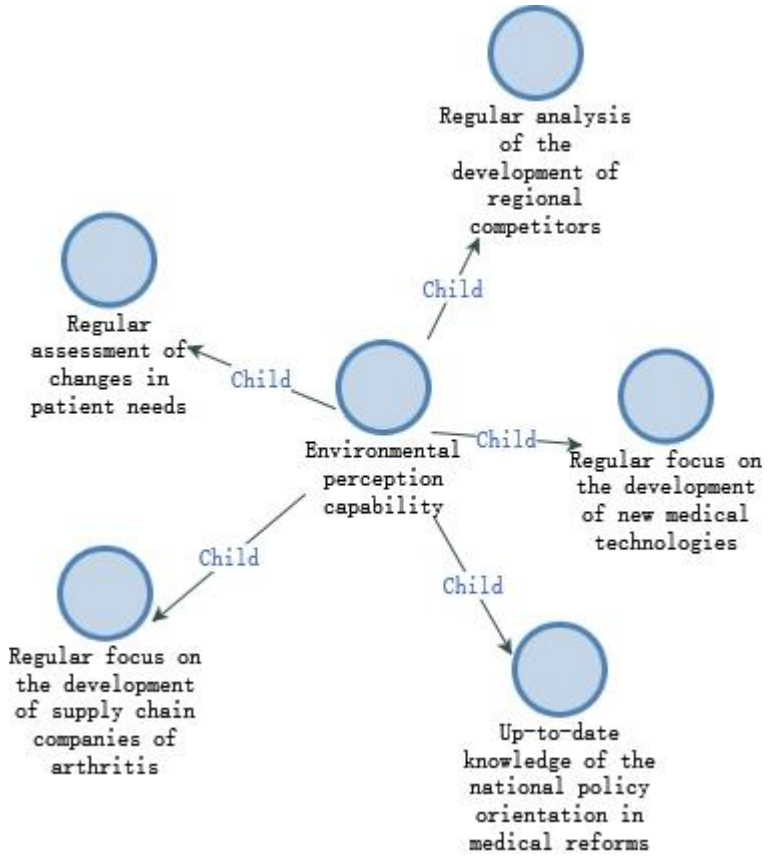

Figure 4.2 Project map of the node of environmental perception capability

Through the analysis and summary of the interview materials, the views of the experts on the ecological perception capability of arthritis hospitals are focused on the following five points.

(1) Regular assessment of changes in patient needs

The hospital's perception and identification of the external environment are reflected in a keen identification of the changing needs of patients. Changes in the disease spectrum of osteoarthrosis, as well as the population's increasing aging and the population's growing health awareness, will lead to changes in the needs of patients in the field of osteoarthrosis. It is easy to see that an aging population inevitably brings a trend in the disease spectrum toward degenerative diseases. In addition, the booming economy also causes the changing health needs of the public. As a result, it is concluded that regular assessment of patient needs is a critical initiative in environmental perception.

"The important thing is to identify our competitive advantage or our characteristics. In our specialty, we must keep up with disease trends, our general direction does not necessarily have to be changed, but our vision must change, which has an obvious impact on the specialty and its development". (Expert B)

"Chronic diseases and frequently-occurring diseases are still the main tasks of hospitals in

the future, and with the gradual increase of chronic diseases, we have to invest more and consolidate the advantages of the specialty." (Expert D)

"We should focus on the changing trend of the disease spectrum and make deployments in advance. Only in this way can we catch up with the big trend of the pharmaceutical industry". (Expert F)

"The evolutionary path of the disease spectrum of the Chinese population will be apparent, and the prevalence of chronic diseases such as arthritis and geriatric neurological diseases will continue to explode. There are significant differences in the structure of drug use between China and other countries, and we are expected to achieve breakthroughs in frontier areas". (Expert H)

"As a traditional Chinese medicine hospital, the changing needs of patients indicate which part of our work should be strengthened, and therefore we can try our best to address it." (Expert I)

(2) Regular focus on the development of new medical technologies

The hospital's perception and identification of the external environment are reflected in its focus on the changes in medical technology. For the new technologies and methods, the hospitals should make deployments in advance to maintain a competitive advantage in its continued development. Keeping abreast of up-to-date science and technology and developing a niche market is essential for arthritis hospitals to form their competitive advantages.

"The new technology has been developing fast over the past decade to such a degree that surgeries can be performed following the instructions by robots. It may be the future direction of development". (Expert A)

"Breakthroughs in medical technology present promising development prospects in disease diagnosis and treatment, with huge social and economic benefits." (Expert D)

"With the continuous improvement of medical technology and the increasing accuracy of clinical diagnosis of disease, the doctors should improve their professional skills accordingly." (Expert E)

"Technological change is often the beginning of a change in the industry. We must focus on new products to stay ahead and keep our edge. It is especially true for a medical specialty, which is what we have been doing in recent years". (Expert F)

"We are still cautious about new technologies. Some of the technologies are still in development and do not meet our actual needs, but we also encourage young doctors to keep up with new technologies". (Expert H)

"We are willing to actively use new technologies as long as they comply with national

norms, but legal issues should not be involved." (Expert J)

(3) Up-to-date knowledge of the national policy orientation in medical reforms

The hospital's perception and identification of the external environment are reflected in its sensitivity to the reform of medical treatment, medical security, and pharmaceutical policies. In order to promote the healthy development of the medical industry and urge public hospitals to take the route of high-quality development, the managers should be keenly aware of the policy changes, identify dangers and seize opportunities, and actively respond to them.

"We must be clear in our minds whether these can reflect our characteristics. The ultimate goal is not to calculate how many decoction pieces have been prescribed, but to use the thinking and methods of traditional Chinese medicine to achieve the therapeutic effect, patient satisfaction, and high-quality development". (Expert A)

"Policy changes are momentary; we shall follow our established guidelines." (Expert D)

"This is the initiative of China's continuous deepening of healthcare reform and exploration of the model of high-quality development of public hospitals, which requires us to follow the policy guidance to formulate strategic development plans." (Expert F)

"The linkage between medical treatment, medical security, and pharmaceutical reforms represents the main aspects of the healthcare industry. For us, it means adhering to the problem-orientation philosophy, seizing the main contradictions, unifying the ideological understanding, focusing on improving the weak links, and establishing mechanisms, making continuous innovation and exploration in practice, and making continuous summaries and corrections." (Expert H)

"This requires a forward-looking and sober perception for hospitals to grasp the policy orientation in a timely and accurate manner." (Expert J)

(4) Regular analysis of the development of regional competitors

The hospital's perception and identification of the external environment are reflected in the analysis of the medical market environment in the region. Regular analysis of the development of other arthritis hospitals, as well as the arthritis specialties in general hospitals in the region, can help the hospital to understand its business development clearly.

"Understanding the size of the market is important, but understanding whether the market is trending toward expansion or contraction is critical for hospitals to make strategic and business development decisions." (Expert C)

"We must have our judgment on the current situation. In tactics, we must make appropriate adjustments, but in the overall strategy, we must confirm our direction, and we cannot be easily affected". (Expert H)

"We do not focus too much on our regional competitors because we have formed a brand effect, and our competitors may be in the market across the country. We will keep up with the latest trends and business directions and adjust according to our characteristics". (Expert I)

(5) Regular focus on the development of supply chain companies for arthritis

The hospital's perception and identification of the external environment are reflected in focus on the development of the supply chain companies in the field of arthritis. Supply chain companies mainly include pharmaceutical companies and medical equipment companies. The hospital needs to assess the competitive landscape of supply chain companies to judge the cost changes and supply security.

"In the field of joint diseases, the medical equipment suppliers exert a huge influence. Due to the different policies in different places, under the centralized bidding mode, we have established a new supply system to ensure the continued stability of the supply chain". (Expert C)

"In terms of the supply chain, we made plans long ago. Many years ago, we developed a supply system different from other hospitals to have all the links under our control. Therefore, the external changes will not affect our stability". (Expert D)

"The development of joint disease in the last 20 years cannot be separated from the promotion of the companies in the medical equipment supply chain, which is a window of time to promote the discipline's development rapidly. The reshaping among suppliers is also a challenge for the discipline, and the hospitals should adjust their planning in time to accommodate the development of the discipline". (Expert H)

4.3.2 Analysis of organizational learning capability of arthritis hospitals

Organizational learning capability is an organization's ability to recognize the value of new external information, learn and absorb new information and knowledge, and apply it to business activities (Cohen & Levinthal, 1990). The ability to grasp the latest progress in the discipline is key to maintaining a competitive advantage. Due to the particularity of the medical profession, with advances in technology, medical theories and skills are changing rapidly, so the importance of learning ability in hospitals is evident. The definition of a research hospital was introduced in 2003 by Jiang et al. (2003) from Ruijin Hospital of Shanghai Jiaotong University, which implies that hospitals are also important platforms for research at the same time. In addition, hospitals also undertake the responsibility of teaching, primarily university-affiliated hospitals, and they are also bases for standardized training of resident physicians and specialists. Organizational learning is reflected in the medical business, operation, and management.

According to their resources and capabilities, they can find corresponding benchmark hospitals or competitors to emulate or build strategic alliances or medical associations to complement their strengths and enrich their core competencies. The project map of the node of organizational learning capability drawn by NVivo is shown in Figure 4.3.

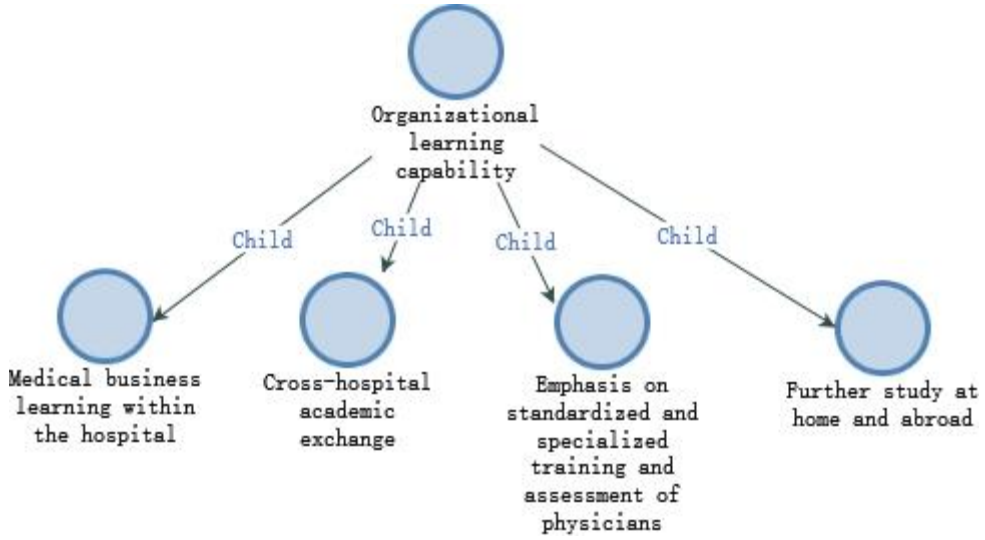

Figure 4.3 Project map of the node of organizational learning capability

The interviews show that the experts are more concerned about medical business learning within the hospital, participation in academic conferences, standardized and specialized training for young physicians, and further study at home and abroad.

(1) Medical business learning within the hospital

The hospital's organizational learning capability is reflected in constructing an internal medical business learning system. The primary forms of internal medical business learning include the regular reading of cutting-edge literature, clinical problem-oriented research progress exchange, and preoperative discussion and postoperative review based on surgical cases in the hospital. In addition, multidisciplinary consultation and discussion of complex cases based on clinical problems are vital to strengthening the quality of medical services and enhancing the medical capability of the hospital.

"We have a case discussion or business study meeting for all orthopedic physicians because we all have rich experience. Sometimes the whole department will read the images and learn the latest literature. The whole process lasts about an hour and a half or so". (Expert C)

"We use learning to promote business improvement, consolidate professional ability, strengthen the quality of medical services, to lay a solid foundation for the continuous improvement of medical quality and safety". (Expert D)

"Even as a small team, we attached importance to medical business learning. We learn every week, explain the literature to explore the research subject, and then report the progress

of special cases. Business learning is an excellent habit, especially for postgraduate training. I think medical business learning is outstanding". (Expert E)

"We attach great importance to medical treatment issues and meet regularly to discuss them. We want quality improvement, and we care nothing about losing face". (Expert E)

"We organize retrospective reviews regularly. This is a secondary summary of medical experience and a regular medical business learning and experience summary. We started this tradition many years ago. After the completion of each surgery, we summarize the gains and losses. When young doctors meet problems, whether they are basic problems or difficult problems requiring multidisciplinary treatment, we often exchange with each other to gain improvement. Of course, this is not personal, and we focus on the problems themselves. It is a good way to enhance our medical skills". (Expert H)

(2) Cross-hospital academic exchange

The hospital's organizational learning ability is reflected in the cross-hospital academic exchange. By learning the treatment experience and technology of famous experts from other hospitals, doctors can make up for the current blind spot of knowledge. In addition, the organization of academic conferences can gain more recognition from peers in the industry and improve the hospital's reputation.

"Usually there are only local experts, but suddenly a bunch of top experts comes, and we find that the world outside is so big. There are experts from famous hospitals such as Peking Union Medical College Hospital and Shanghai Ruijin Hospital. Everyone suddenly feels that the world is so big and their horizon has been broadened". (Expert A)

"We have established good relationships with all the hospitals with strong orthopedics. We can invite many orthopedic academicians to our annual orthopedic meeting, which greatly benefits young doctors to improve themselves". (Expert B)

"We motivate our medical staff to participate in academic conferences at home and abroad. It is a great opportunity for their self-promotion, understanding of the latest development trends in the specialty, as well as publicity for the hospital". (Expert F)

"We meet regularly to discuss difficult cases, including discharge cases, and the requirements of some important meetings." (Expert H)

"We should do our job, this is the most important thing, but we also need to keep learning from the strengths of others. If others can do well in a particular thing, we should learn from them to improve ourselves". (Expert J)

(3) Emphasis on standardized and specialized training and assessment of physicians

The hospital's organizational learning capability is reflected in the hospital's ability to offer

standardized and specialized training for physicians. China has carried out nationwide standardized training for resident physicians since 2014 and pilot standardized training for specialist physicians in 2016. Regarding organizational learning, having a standardized training base for specialist physicians affirms the hospital's professional skills and teaching level. In correspondence to training, there should be an appropriate assessment system that should be people-oriented. On the one hand, we should focus on general training practice so that the doctors can master the necessary knowledge and skills of general practice; on the other hand, there should be targeted assessment for the doctors to achieve personalized training.

"By training young doctors, the old traditions of the hospital can be slowly integrated. Focus on research and teaching can consolidate the basic knowledge of the young doctors". (Expert D)

"Strengthen theoretical learning is a way of modular training. The so-called modular training is a way to train doctors of different seniority in different forms". (Expert E)

"Formation of a talent echelon needs standardized training as its foundation. The medical staff has different learning and technical tasks at different stages. For example, the young medical staff is supposed to study a lot to build a solid foundation for their future practice". (Expert H)

"To train specialist talents, we carry out rotational training in different specialties and secondary disciplines." (Expert I)

"Doctors at different stages should be trained in different ways. For junior doctors, the main task is to build a solid foundation, and regular assessment and training can help them a lot". (Expert J)

(4) Further study at home and abroad

The hospital organization's learning ability is reflected in the opportunity and system of guaranteeing its reserve talents to go to benchmark hospitals at home and abroad for further study. As this approach needs more input than the former approaches, it is more suitable for a small group of people, but the learning is more profound and systematic. In addition, through further study, the hospital can not only obtain knowledge of the benchmark hospitals in medical capabilities but also know the development situation of the benchmark hospitals, as well as their hospital management philosophy.

"People's knowledge and vision are critical. Only when they go to different places for learning will they recognize many of their limitations. Most importantly, their thinking and understanding will differ, so their future development path will also be very different". (Expert B)

"Young doctors should go to famous hospitals abroad for further training or go to top hospitals in Beijing and Shanghai for further training. They should have the heart to learn, and hospitals should create conditions for further study". (Expert C)

"To cultivate talents, we must constantly create opportunities for them to go out and learn to promote their growth and tap their potential." (Expert D)

"To carry out research, you should always uphold innovative thinking. Except for some applied technologies, you should keep learning everything". (Expert E)

"Young people should go abroad more often to absorb advanced foreign technology and ideas. We should make different learning arrangements according to the characteristics of different people to promote their growth. In this case, they are more likely to have a better prospect in their future development". (Expert H)

"We should send them abroad, to Hong Kong, Beijing, or Shanghai, to enable them to stay creative and to learn advanced technology, thinking and ideas." (Expert I)

4.3.3 Analysis of organizational change and innovation capability of arthritis hospitals

Organizational change and innovation capability are mainly reflected in the organization's initiative to take risks to advocate innovation, encouragement of employee innovation, and internal resource integration and reorganization. The organizational change and innovation capability reflects the organization's attitude toward innovation. In essence, organizational rigidity is a resistance to organizational innovation and change. Organizations must overcome organizational rigidity and capability rigidity to achieve change and create motivation for continuous learning. Therefore, if organizations want to be able to respond to rapid changes, they need to build a new culture within the organization, create a climate of innovation, encourage innovation and change, give employees ample room for innovation, and invest the necessary funds and equipment to facilitate change within the organization to adapt to changes in the external environment. The project map of organizational innovation and change capability drawn through NVivo is shown in Figure 4.4.

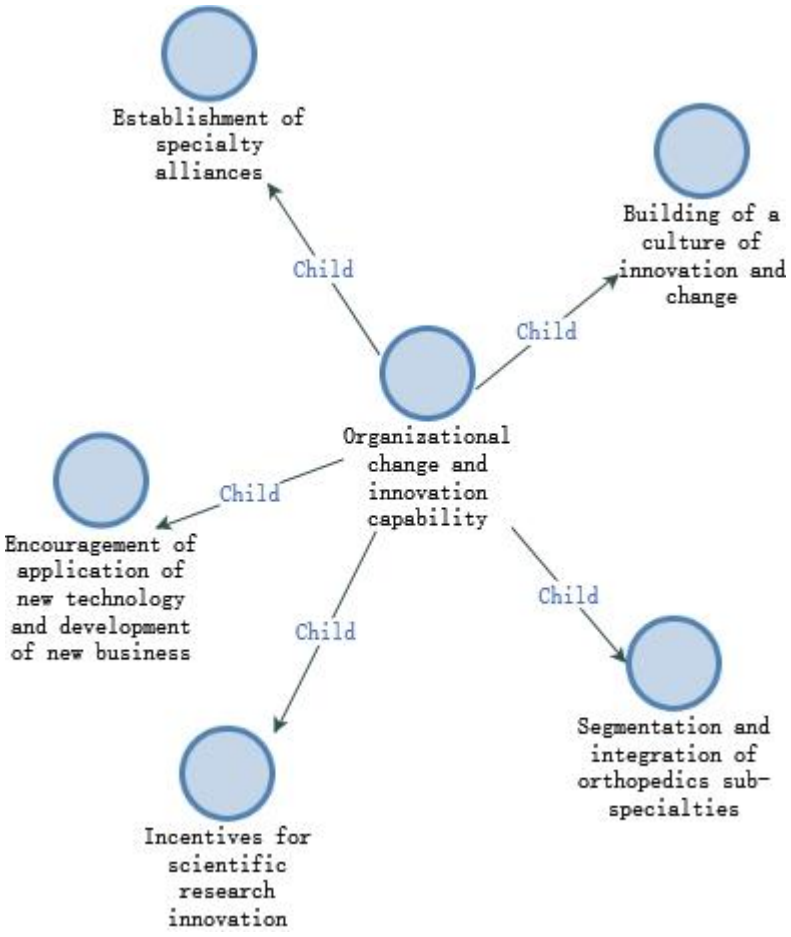

Figure 4.4 Project map of the node of organizational change and innovation capability

Through the interviews, most experts are most concerned about the segmentation and integration of orthopedics sub-specialties, incentives for scientific research innovation, encouragement of application of new technology and development of new business, building of a culture of innovation and change, and establishment of strategic alliances for arthritis.

(1) Segmentation and integration of orthopedics sub-specialties

The hospital's organizational change and innovation capability are reflected in the segmentation and integration of orthopedics sub-specialties in specialized hospitals for joint diseases. The advancement of the precision medicine model provides highly efficient treatment and management for specialized diseases. In addition, it also requires hospitals to be equipped with the top medical capabilities and technologies for this specific disease. Limited by resources and capabilities, hospitals often invest in only one or several advantageous specialties to build the hospital brand and develop core competence.

"A sub-specialty is a differentiated development, which is related to the environment of the department or hospital, while we make some innovations." (Expert A)

"The development of sub-specialties is united and competitive. Only healthy competition can help it develop better, while vicious competition will prevent the development". (Expert B)

"We should first let people know the name of our discipline (revision), and then expand the scope of our services and further segment the specialties. We all have different divisions of labor, and an administrative department can be established specifically". (Expert D)

"According to the traditional formation of brands, the building of a brand needs accumulation of years and generations of efforts, but for some of the new disciplines and new hospitals, relying on the business to build the brand is not feasible because it will take too long, and this is what we need to explore." (Expert I)

"There are regulations regarding the setting of sub-specialties. There should be justified in terms of the qualifications of the leading persons, the number of medical groups, and the number of sub-specialty surgeries. Due to the limited talent and input, we must conduct a strict justification before implementation". (Expert H)

(2) Incentives for scientific research innovation

The hospital's organizational change and innovation capability are reflected in implementing effective institutionalized incentive policies for innovative activities such as scientific research, publication of academic articles, application of research projects, and transformation of research results. Effective incentives can chart the course for the staff and hospital development.

"We offer a generous incentive in scientific research to stimulate and encourage employees to do research and produce results." (Expert C)

"Continuous incentive policies at weak points where innovation is needed can stimulate people's motivation for innovation, especially among young people. This way, senior doctors can have a good update of knowledge and ideas". (Expert D)

"The incentive policy has been implemented in our hospital for many years, and it is significantly effective in improving the business and research capabilities of the hospital and the departments." (Expert E)

"There are certain incentives, and that is where some of the revenue comes from. Doing some of the other things may generate slightly less income, but it brings hidden benefits that are not insignificant". (Expert F)

(3) Encouragement of application of new technology and development of new business

The hospital's organizational change and innovation capability are reflected in encouraging medical teams to develop new businesses and technologies and expand their market segments with supporting incentive policies. The development of new businesses in hospitals helps tap into potential markets and expand the business scale. In addition, the development of new technologies also facilitates the promotion of the hospital and contributes to the establishment

of the hospital brand.

"There must be incentives to encourage people to learn new things." (Expert C)

"We can only support part of the new technologies in a limited scope, and these technologies must be mature and safe." (Expert E)

"Incentives are indispensable. In other words, if you ask them to make innovations but do not provide them with a certain incentive mechanism, it will be challenging for them to carry on in this specialty. So, if you want them to make innovation, such an incentive mechanism must be in place". (Expert G)

"Medical insurance is a challenge. To strike a balance between the development of new technologies and retention of balance is still somewhat challenging, so we have issued relevant regulations". (Expert H)

(4) Building of a culture of innovation and change

The hospital's organizational change and innovation are reflected in building a culture of innovation. A culture of innovation includes changes in hospital management and medical technology and innovations in treatment models that can evoke a sense of initiative and responsibility among the hospital staff. Fostering innovative values and attitudes can promote continuous progress in hospital efficiency and functional development.

"The cultural and development model and the development guideline of the hospital in the new era should complement each other, and both can contribute to each other's development." (Expert A)

"We have developed an inclusive and open style and printed the hospital's slogan directly on the patient gowns. At first, I thought this was incredible, but the goal was to create such confidence, and our final goal was to become such a center". (Expert C)

"The hospital attaches great importance to the quality of medical care, and we learn from each other. We have a meeting every month. The difficult problems encountered in medical work, or the complications of patients after surgery, will be discussed. These are internal discussions that are not recorded so that everyone can open their hearts and minds to speak freely, which greatly improves everyone". (Expert E)

(5) Building of specialty alliance

The hospital's organizational change and innovation capability are reflected in external cooperation and the construction of specialty alliances. Due to the shortage of medical resources in China, arthritis hospitals can promote the division of labor and collaboration by establishing specialty alliances. Through the promotion of two-way referral, hierarchical diagnosis and treatment, sharing resources of disciplines and talents, and establishment of a remote

collaboration platform, the arthritis hospital can concentrate the valuable resources to improve the capacity and level of specialist treatment and further expand its business scale and enhance its regional influence and competitive advantage with the construction of the specialty alliance.

"The strategic alliance has many similarities with the medical association. It promotes effective internal communication and mutual improvement. It can enhance the influence of the hospital in the region, speed up the time and increase the number of patient admissions, and help build a broad and more influential medical platform". (Expert C)

"In a medical consortium, which is a strategic alliance, the large hospitals can support the development of small hospitals, guide the improvement of their business levels, and also help them enhance the timeliness of patient transfer." (Expert E)

"We have to seize the opportunity in the reform by playing our role in the two-way referral. You can count on us for complex orthopedic problems". (Expert G)

"Technology leads the development, and innovation makes the future. The establishment of a closely-knit alliance can enhance interconnection and interoperability, improve the management level of hospitals in the region and promote their synergistic development". (Expert H)

"We ask our doctors to learn from the benchmark hospitals such as Shanghai Ninth People's Hospital, Shanghai Sixth People's Hospital, Ruijin Hospital, Beijing Jishuitan Hospital, 301 Hospital, and Peking Union Medical College Hospital with strong orthopedics, and we have established an excellent partnership with them". (Expert I)

4.3.4 Analysis of organizational flexibility of arthritis hospitals

Organizational flexibility requires an organization to be highly flexible in the fierce market competition of the information age to respond quickly to external changes and make timely strategic adjustments. The rigidity within the organization can no longer meet the needs of organizational development. In order to achieve flexible management, an organization should break the old rules, change the working model, maintain organizational flexibility and elasticity, and change the strategy according to the time and place (He, 2006b). The flexible management of an organization can promote the formation of employees' self-improvement consciousness, with which they will consciously improve their work and enhance their working ability. In addition, improvement in employee quality can also lead to improvement in product quality, work efficiency, and overall organizational competitiveness. Therefore, organizational flexibility can help an organization fully use its talents. An organization can make quick and accurate decisions to win in the fierce market by giving employees a certain degree of autonomy.

Arthritis hospitals are technology-intensive organizations, and the employees are mainly highly educated people. Flexibility within the organization needs to focus on the individual needs of employees, and the human resource management strategy needs to be more in line with the employees' work value and time costs. In addition, to avoid the rigidity of hospital rules and regulations, flexible guidance based on hospital culture, staff career planning, and innovation mechanisms can be established to stimulate employees' enthusiasm. In terms of organizational structure, the hospital can remove many management levels and implement flat management, reducing communication costs and improving work efficiency. The project map of organizational flexibility drawn through NVivo is shown in Figure 4.5.

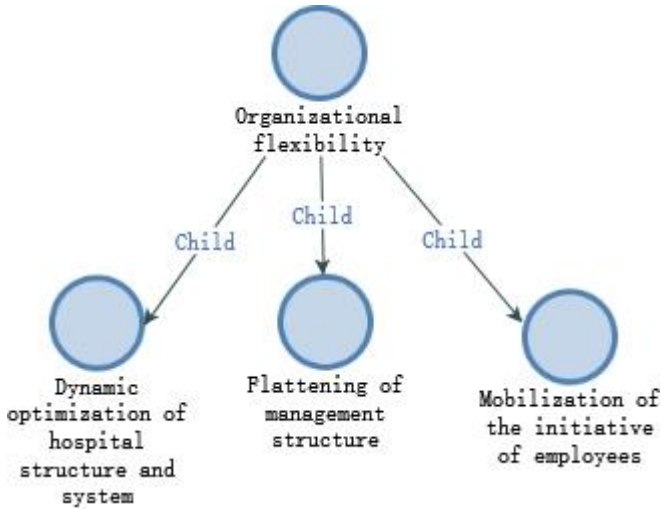

Figure 4.5 Project map of the node of organizational flexibility

Through the interviews, most experts are most concerned with the timely adjustment of hospital structure and system, flattening of management structure, and mobilization of staff initiative.

(1) Dynamic optimization of hospital structure and system

The hospital's organizational flexibility is reflected in its need to maintain a flexible organizational structure. This requires the ability to adjust the hospital's institutional settings, management system, and process design promptly based on the traditional management model so that the hospital has some flexibility in performance evaluation.

"The hospital's management system is the bottom line, but the processes can be optimized to fit the operations and serve the clinical treatment." (Expert A)

"Because of some objective external reasons, we will reorganize the process and performance allocation." (Expert B)

"The organizational structure of public hospitals is a relatively fixed model, but appropriate adjustments and integration can be made at the management level to reduce

unnecessary waste of administrative resources." (Expert F)

"Hospital institutional settings can be developed according to their characteristics and positioning, and flexible adjustments can be made except for those required by national norms." (Expert H)

"Hospital institutional settings can be developed according to its characteristics and positioning and can be flexibly adjusted except for those required by national norms." (Expert H)

(2) Flattening of management structure

The organizational flexibility of the hospital is reflected in flat governance. The hospital's management structure should be simplified by using information technology tools such as the media to transfer information and promote the efficiency of internal communication, thus forming a flat governance structure to ensure timely and effective decision-making.

"Some directors are specialized in administration and need to communicate with deputy directors in charge of medical affairs to develop policies." (Expert C)

"The decision-makers in a flat organization are confronted with a large number of decision-making participants and implementers, and at the same time, they can make the organization dynamic. How to achieve high quality of operation? This is a test of the executive ability of the decision-makers". (Expert D)

"Flattening structure and operational practices also requires the employees' identification with the organization's dominant culture, thus ensuring its leadership." (Expert I)

"Flat management facilitates communication between upper and lower levels, and increases work efficiency in addition to timely delivery of decisions." (Expert J)

(3) Mobilization of the initiative of employees

The hospital's organizational flexibility is reflected in the mobilization of the initiative of employees. Under the flexible management model of the hospital, mobilizing the initiative of employees can give full play to their expertise and increase work efficiency. The work patterns can also vary from person to person and from time to time. To a certain extent, hospitals should allow departments and employees to break the rules and maintain work flexibility.

"In other rules and regulations, such as attendance and performance evaluation, we can make appropriate adjustments. However, the medical system does not belong to the scope of flexible management. Excessive emphasis on flexibility may compromise medical safety and quality, which is the red line we should never cross". (Expert A)

"We have started performance reform further to improve the rationality and appropriateness of performance distribution and fully mobilize the enthusiasm of the

employees." (Expert C)

"In addition to business considerations, we can pay more attention to the feelings of the hospital employees so that they can feel their value and strengthen their sense of achievement, which is an important factor to motivate employees' initiative." (Expert E)

"We have regular meetings where front-line staff can directly communicate with the hospital leadership." (Expert G)

4.3.5 Analysis of building of strategic barriers of arthritis hospitals

Strategic barrier, or the inimitability and impaired mobility of resources and capabilities, is one of the keys to the dynamic capabilities to become sustainable competitive advantages (Barney, 1991; Rumelt, 1984). Strategic barriers can be built in various ways, such as the ownership of property rights to scarce resources, as the ownership itself is protected and used with a certain exclusivity (Teece, 2007). It can also be achieved through quasi-rights against the imitative competition, such as unknown causes (Lippman & Rumelt, 1982) and the ability to create unique intellectual assets (Teece, 2007).

For arthritis hospitals, technology and talent are still the key factors in building barriers within the industry. With the diversification of academic exchange opportunities and formats and the improvement of medical technology, physical isolation can no longer establish an advantage. However, the accumulation of intellectual property and technology within a hospital must be established slowly and thus can be used as a way to build strategic barriers. High-level talents who master the core technology of the hospital are crucial to building medical technology barriers, and preventing the loss of core staff is also an essential strategy for the hospital. Brain drain prevention must be accompanied by continuous technology renewal within the hospital to avoid technology monopolization by individuals. In addition, patient satisfaction and hospital brand reputation require years of operation and continuous input and are also scarce resources for hospitals. The project map of the node of the building of strategic barriers drawn by NVivo is shown in Figure 4.6.

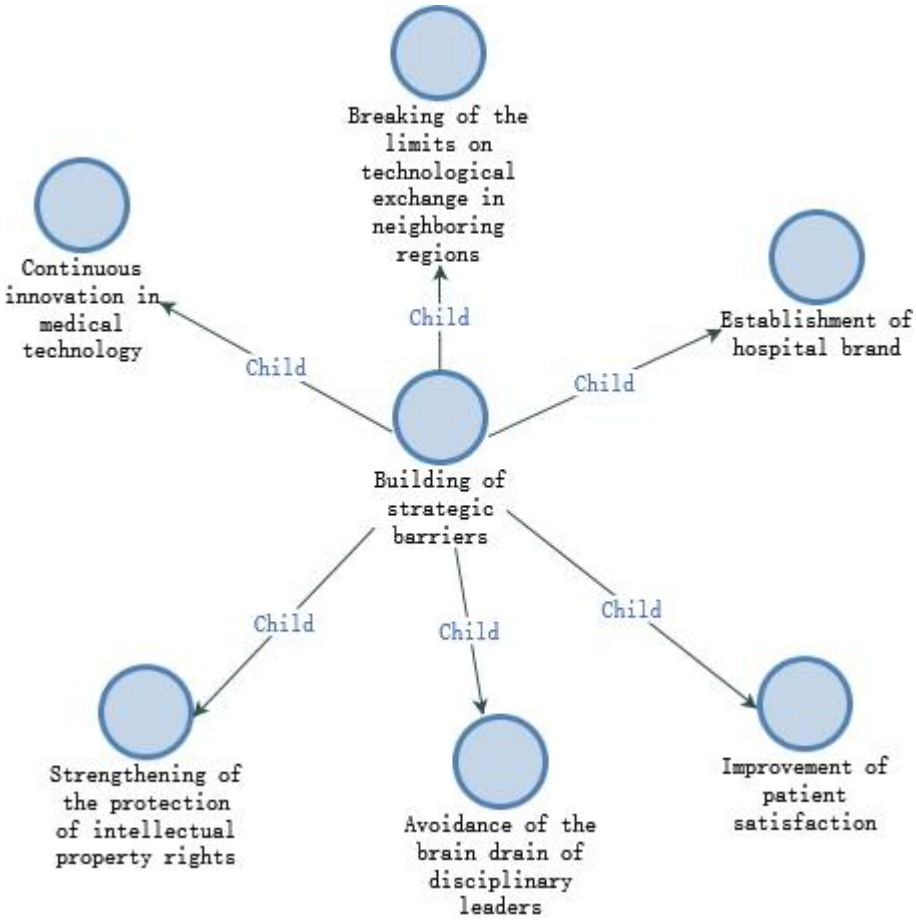

Figure 4.6 Project map of the node of the building of strategic barriers

Expert interviews indicate that the building of strategic barriers can be carried out through the promotion of intellectual property protection, prevention of the brain drain of core staff, continuous technological renewal, improvement of patient satisfaction, and establishment of hospital brand.

(1) Breaking of the limits on technological exchange in neighboring regions

The research group and the interviewed experts discussed in detail the strategic barriers of arthritis hospitals. The interviewed experts generally agreed that strategic barriers should not be physical with the increased learning channels and the sinking and popularization of medical technology. The core competitiveness of hospitals should be developed toward the ability to treat complex and challenging diseases. In the past, public hospitals established technical barriers by restricting medical staff from other hospitals in the city or within a radius of 200 kilometers on further study in the hospital. Mainstream hospitals have abolished this approach of building physical barriers over the past decade, and only a few hospitals or departments still use this approach.

"We never restrict those from other hospitals for further study, and in fact, we have increased the recruitment of such people because it is important for the brand promotion of the

hospital." (Expert A)

"There is no need for us to restrict them in the current situation, nor can we restrict them. There are many ways of further study, and you can always learn what you want to learn using online media. Therefore, we do not do this." (Expert D)

"As long as the doctors in the surrounding regions want to learn, you cannot restrict them. If they cannot learn in your place, they can also go to other places. They can even go to Beijing and Shanghai, or abroad, reducing the communication between us in the region and is not conducive to the overall development." (Expert F)

(2) Strengthening of the protection of intellectual property rights

Hospitals must be sensitive to competition and apply for patents in time for practical designs, methods, or products to protect hospital intellectual property and form local advantages. In the past, hospitals did not pay enough attention to protecting intellectual property rights. For example, some Chinese hospitals did not apply for patents for their prescriptions or self-designed medical tools or instruments and gradually lost their advantages to competitors' imitation.

"The innovation process in the healthcare industry features high-investment and high-risk, and intellectual property is an important mechanism to protect the interests of innovators." (Expert B)

"The medical industry in China has a large discrepancy compared with developed countries in terms of the importance attached to intellectual property rights and their protection, but this is the key to obtaining market returns and must be protected." (Expert E)

"The industrial structure of hospitals is greatly affected by related policies, and specific laws and regulations are needed to protect the legitimate interests of innovators and stimulate the innovation of personnel to form their results." (Expert F)

"Intellectual property is one of the manifestations of the hospital's core competitiveness, and the absence of protection is equivalent to losing its competitiveness." (Expert I)

(3) Avoidance of the brain drain of disciplinary leaders

Ordinary employees need to have a sense of belonging to the hospital. The hospital needs to establish a reasonable salary system for medical staff, provide a platform for career growth, and reduce work pressure. The core medical skills of disciplinary leaders are often subject to a long learning curve and a long training period, such as the ability to diagnose and treat complex diseases and related operational skills of internal medicine specialists, the prescription and medication techniques of Chinese medicine specialists, and the complex surgical techniques of surgical specialists. The loss of core staff is a significant loss for public hospitals; therefore,

avoiding the brain drain of disciplinary leaders is one of the keys for hospitals to establish strategic barriers. The core technologies of a hospital cannot be concentrated on one or several individuals; it is advocated to share technology between teams and promote internal discussion and exchange. In addition, the hospital should also strengthen the training and reserve of the same type of talent.

"There must be a set of perfect reward and punishment mechanisms in terms of incentive policies, and there should also be specific assessment indicators." (Expert B)

"Sometimes affected by the external environment, we take some measures to motivate our employees. With a revenue and expenditure balance, we can maintain the satisfaction of the medical staff and enhance their enthusiasm". (Expert C)

"Hospitals should improve and innovate the unified form of remuneration and adopt diversified forms of remuneration, which on the one hand can improve the rationality of the hospital remuneration system and on the other hand can effectively satisfy the diversified needs of the medical staff." (Expert H)

"Our incentive mechanism is affected by policy changes. There should not be too many restrictions; otherwise, its motivating role will be limited. The incentive can only be increased and cannot be reduced. The front-line medical staff should be prioritized, and currently, no one is dissatisfied". (Expert I)

"Performance-based pay should be relatively high; then the motivation will be endogenous. Then we can establish the platform of the external driving force to build a good mechanism and a favorable atmosphere so that the medical staff can all be stimulated". (Expert J)

(4) Continuous innovation in medical technology

Continuous technological innovation is an effective means for organizations to maintain a competitive advantage. With the popularization of advanced medical technologies, "imitation" seems to bring faster returns than innovation. However, organizations often need more than one superior product or service to maintain a competitive advantage. Instead, they build strategic barriers by continuously releasing more products or services, building a free-field platform, or linking products together to form an ecology.

For arthritis hospitals, developing a long-term competitive advantage must rely on more than just one medical service or superior competence. Technological renewal requires not only seeking breakthroughs in innovation opportunities but also integrating a series of excellent disciplines or talents to form core competencies, such as medical groups that can provide low-cost and high-quality medical services, expert groups that can complete complex disease diagnoses, medical equipment and teams that can complete complex orthopedic surgeries, and

critical care medicine teams that can handle emergency and critical illnesses. In addition, establishing a medical big data platform, medical specimen repository, and extensive research platform are also crucial to building strategic barriers for hospitals.

"We must keep up with the development of the new technology. It can open our eyes for one thing, and for another, we can utilize them to promote the growth of our medical staff. " (Expert A)

"We are still cautious about introducing new technologies. Although some technologies are in the development stage, we also encourage young doctors to learn about them." (Expert F)

"We regularly study the literature on new technologies under the guidance of our disciplinary leaders, and we absorb the new knowledge by judging whether it is the future direction." (Expert G)

(5) Improvement in patient satisfaction

Patient satisfaction measurement is one of the leading indicators of the performance assessment of tertiary public hospitals and a direct reflection of the hospital's word-of-mouth and reputation. In addition to the quality of medical care, patient satisfaction is also related to the process design of hospital medical services. It is also designed to alleviate the conflicts between doctors and patients. Patient satisfaction evaluation is mainly reflected in the satisfaction of outpatients and inpatients with the optimization of service processes.

"Satisfaction is whether or not patients get benefits, whether or not they can benefit, so our medical service should take this as our ultimate goal." (Expert B)

"Doctors are providers of medical services, and they also need to care about mental health issues of the patients and families. The satisfaction indicators and optimization should be more pertinent." (Expert F)

"Medical services should separate the disease from the person and truly establish a human-centered service delivery experience." (Expert I)

(6) Establishment of hospital brand

Establishing a brand can bring a tremendous competitive advantage to the hospital in the regional competition. Some hospitals established with a long history already have a good reputation and significant influence in the public's hearts. In the information age, awakening the public memories can help hospitals establish a brand-new image.

"If people recognize a certain hospital, they will form a stereotype that to treat a certain disease, you must go to a certain hospital, and they recognize it as the strongest local specialized hospital. Some hospitals are not only famous locally, but well-known nationwide, which greatly enhances hospital reputation and influence and promotes hospital development."

(Expert C)

"The development of medicine needs historical accumulation, that is for sure. A hospital with a long history will develop at a faster speed. It has a culture passed down from several generations, inherited development." (Expert E)

"People choose to go to a hospital based on its technology and service, which is formed in the long-term historical accumulation of the hospital." (Expert G)

"Traditionally, forming a brand takes years, generations, decades of efforts, thus forming the hospital's reputation." (Expert I)

"Hospital branding is essential. Patients with the same disease may have different outcomes if they go to different hospitals, which is the power of a brand". (Expert J)

4.3.6 Analysis of core competence of arthritis hospitals

The core competence of a hospital is a set of complementary skills and knowledge that enables the hospital to achieve a sustainable competitive advantage in a particular area. It guarantees that one or more of the hospital's key businesses are at the top level in the industry. It is a significant source of competitive advantage and a necessary guarantee of value growth for the hospital. The hospital's core competence is the key to establishing its competitive advantage. By analyzing the trajectory of the hospital's history and development, the core growth point of its business can be identified, and its core competence can be found in its advantageous capabilities. Core competence is like a solid platform, which is the foundation to ensure the development of the hospital's diversification strategy. Any medical field can be a potential area for the hospital to explore as long as the key capabilities it requires match the hospital's core competencies.

As for arthritis hospitals, their competition has gone through three stages, namely, equipment competition, technology competition, and service competition. Similar to the development of strategic management theory, the competition also moves from outside to inside to create hospital core competencies. It is evident that core competencies are also dynamic and will change according to the changing environment. The project map of hospital core competence drawn by NVivo is shown in Figure 4.7.

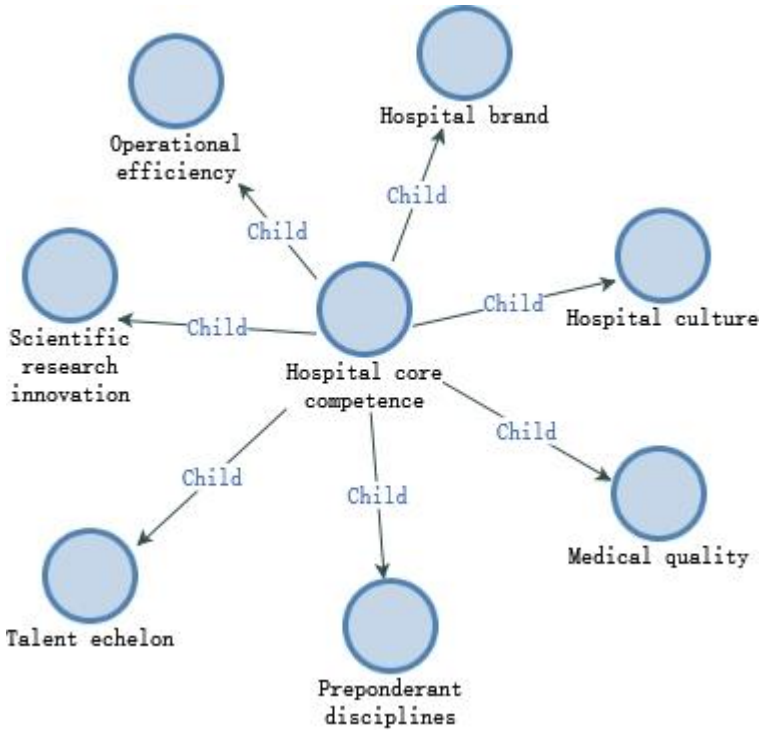

Figure 4.7 Project map of the node of hospital core competence

The experts interviewed elaborated on the core competence of the hospital in six aspects: medical quality, preponderant disciplines, talent echelon, scientific research innovation, operational efficiency, hospital brand, and hospital culture.

(1) Medical quality

The core competitiveness of the arthritis hospitals is mainly reflected in the medical quality, which is also the core competence of the hospital in the regional competition.

First, in orthopedic joint disease, the surgical competence of the medical team, as the most core clinical skill, is an essential indicator of hospital and departmental concern.

"The orthopedic technique has a high technical barrier, especially the joint surgery, and academic exchanges in recent years have narrowed this gap, but the surgical capability is still an important point to measure the level of surgery-related specialties." (Expert A)

"Improving surgical techniques in surgery, especially orthopedic and joint surgery, requires a relatively large number of surgeries, and by increasing the number of surgical items or cases, we can significantly improve the manipulative ability of residents, which is the basis for enhancing the surgical ability of the team." (Expert D)

"The ranking of surgical volume is very different from the ranking of the overall strength of the hospital, which is a reflection of hard power. Sometimes the external data cannot reflect everything, but it is the core of the hospital specializing in joint disease." (Expert I)

Second, hospital medical quality should be based on the hospital's treatment technology

and ability to treat complex cases to reflect the hospital's competitive *"*height.*"* In the case of arthritis hospitals, medical quality is mainly reflected in developing and implementing preoperative plans for complicated surgeries.

"*Complex surgery is a product of multidisciplinary integration, requiring good coordination and operational capabilities, and the hospital's competence is also reflected in such details.*" *(Expert B)*

"Many difficult surgeries are now more demanding, so the establishment of relevant systems is the cornerstone to ensure safe implementation." (Expert G)

"Sometimes the development of surgical techniques depends on advances in science and technology, and innovation in basic scientific research is essential. The specialized hospitals should work in tandem to close the gap to improve their competitiveness in complex surgery." (Expert J)

Third, medical safety is the foundation of medical quality. In arthritis hospitals, medical incidents or surgery-related complications can significantly erode patient trust and hospital reputation if exposed to the media. In particular, the integrated security guarantee capability is crucial for arthritis hospitals.

"That is for sure; we need to ensure that our technology is among the top in our province or China so that patients do not need to go to Shanghai and Beijing. We can catch up with all the international advances in this specialty." (Expert A)

"Medical technology and quality are the basis for the survival of a hospital, without which development is the only castle in the air. The primary surgeon in our team bears a variety of duties and responsibilities, and the unity and collaboration of every team member is also the manifestation of our core competence because no task can be completed with only one person. Surgical ability is not only the hospital and department concern but also a capability we must improve ourselves as surgeons." (Expert E)

"Medical safety is the core of the hospital system." (Expert E)

"Medical service satisfies the needs of patients while reflecting the values of a doctor, which is the most important." (Expert F)

"With the development of specialties, strong specialty and small scale of general medical service will be the development direction of the specialized hospitals, and this is also a foundation for the safer and better development of hospitals." (Expert F)

"The security guarantee capacity of specialized hospitals is the foundation, without which it is difficult for them to become bigger and stronger."(Expert G)

"I think as a hospital, the most important thing is to diagnose and treat diseases, and its

technology should be among the top in the industry because the technological level is fundamental." (Expert H)

Fourth, medical quality is reflected in the application of information technology. Hospitals must improve the standardized treatment process for common and frequently-occurring diseases if they want to make a breakthrough in high-quality development. Standardized informatization is the key to pursuing high efficiency without compromising medical quality.

"Informatization is necessary to improve management efficiency, but it is not easy. Implementing it through self-learning in the short term is impossible, so we still need to resort to professional companies to develop a program." (Expert C)

"Information platform construction is a key task in hospital informatization. Even hospitals that have already established an information platform need continuous improvement to meet the changing needs." (Expert G)

"The improvement of hospital informatization can, on the one hand, provide patients with humane medical services, and, on the other hand, improve the treatment technology, strengthen the training of talents, and integrate high technology with elite talents." (Expert J)

(2) Preponderant disciplines

Disciplines are the essential components of a hospital. The so-called preponderant disciplines are the disciplines with relatively high medical levels, good medical service quality, promising development prospects, reasonable structure of talent echelon, discipline leaders with high academic attainments, sound scientific research and technological innovation, solid supporting measures, and comprehensive muscular strength.

The development of preponderant disciplines is the critical measure to highlight the characteristics of the hospital and launch differentiated competition. The preponderant disciplines are also an integral part of the core competitiveness of the hospital. The preponderant disciplines of arthritis hospitals are usually composed of orthopedics (orthopedic injury), rheumatology, and rehabilitation, especially orthopedics (orthopedic injury). The development of orthopedics (orthopedic injury) needs to be freed from the problem of "large quantity but no specialization" in developing public hospitals to support the specialty's development with limited resources fully. The hospitals should promote the establishment of orthopedic sub-specialties and change the treatment mode from "specialty" to "specialized disease," driving the development of this specialty and related disciplines, forming a cluster of disciplines to provide better medical services for patients.

In addition, the development of orthopedics (orthopedic injury) should also provide a holistic and continuous health management model of prevention, early screening, treatment,

and rehabilitation in the whole stage from the overall perspective of the disease development law. Through medical groups or strategic alliances, arthritis hospitals can work with primary hospitals for two-way referral to realize hierarchical diagnosis treatment, thus improving medical efficiency and patient satisfaction.

"We are taking orthopedics as the advantageous specialty. In terms of overall development, implementing sub-specialty segmentation is a fast channel for advancing cutting-edge technology. The specialty must be focused."(Expert A)

"Whether it is Chinese or Western medicine, the most important thing is to offer treatment to the patients. In our discipline development, there used to be many small mistakes, so in recent years I have unified the thought to Chinese medicine and hope to use the Chinese medicine orthopedic injury to drive the development of the whole orthopedic injury." (Expert B)

"The setting of sub-specialties is indispensable; for example, we set up sub-specialties very early, and several specialized hospitals within the large hospital, and each sub-specialty has a disciplinary leader to give full play to the cohesive ability of the discipline." (Expert C)

"If we want to innovate, we must have this environment. To develop the discipline, we must have this environment. We should give full play to the development platform and focus on their field."(Expert E)

"The development of a discipline needs clinical treatment and scientific research. Only by deepening research based on clinical treatment can you enrich the connotation of the discipline and enhance its height of the discipline. So, our research must be deepened, and we choose the advantageous specialty to deepen research." (Expert G)

(3) Talent echelon

Hospitals are technology-intensive organizations, and the core competitiveness of hospitals is also reflected in the configuration of hospital talent echelons. The disciplinary leaders are the core competence of the hospitals to obtain a competitive advantage. Based on their professionalism and relative authority in the industry, high-level disciplinary leaders are more likely to be recognized in the application of research funds and projects. In addition, high-level disciplinary leaders have shrewd strategic visions and unique insights into the discipline and academic research. Through the personal reputation and influence of the disciplinary leaders, the hospital can get more funding from the government to build a clinical and scientific research platform, thus forming a virtuous cycle.

"The disciplinary leaders can grasp more information. First, they have acute insight; second, since they are at a relatively high level, they can access information inaccessible to others. I think this is also a point that we cannot neglect." (Expert A)

"There is no doubt about the role of the disciplinary leaders. With agile thinking, they can identify issues in the development of science and technology and medical knowledge, and they are more sensitive in this respect" (Expert B)

"The academic leaders of the hospital become the directors of some committees, which can quickly improve the level and status of the discipline in the industry." (Expert C)

"Disciplinary leaders are crucial to hospital dynamic capabilities, but we cannot rely solely on disciplinary leaders; instead, their roles will only be maximized based on their teams." (Expert E)

"The disciplinary leaders stand at a commanding height so they can have a global vision. If you stand at a high point, it will be easy for you to look down. This is also true for a team." (Expert H)

Second, the hospital or department should have a reasonable ratio of senior, intermediate, and junior talents. In an arthritis hospital, it is necessary to focus on the skill training of young doctors to form a pattern in which the senior doctors pass their experience and skills to the young doctors and assist them as their mentors to avoid a monopoly of surgical techniques.

"As team leaders, we must be able to teach and nurture and promote the development of the whole team. The team sustains the development of the specialty rather than a single person, so we should attach special importance to the skill development of young doctors." (Expert A)

"Young doctors are not only responsible for daily clinical work, but also supposed to promote the development of the discipline and overcome difficult cases." (Expert D)

Third, the sustainable development of the hospital is reflected in the whole process of talent training. Suppose a hospital can become a standardized training base for residents and specialists and simultaneously serve as a teaching base for the university to undertake talent training in undergraduate and graduate studies. In that case, the hospital can take advantage of the selection and cultivation of talents.

"After graduate school, they receive residency training, and after residency training, they work for a few years, and this is a practical way to train doctors." (Expert E)

(4) Scientific research innovation

Scientific research projects are the top way to cultivate talent. Suppose hospitals have sufficient research funding, an intense research atmosphere, a complete research platform, and outstanding research capability. In that case, they can have a competitive advantage in the whole process of talent training. In addition, the rapid growth in the number of research projects per capita, the number of patents, and the number of research results transformed can reflect the strong momentum of the hospital's disciplinary development.

"Improvement of the clinical research level and the diagnosis and treatment level are complementary to each other." (Expert E)

"If a hospital can do well in scientific research, it can do well in teaching, which is an improvement to the management of the whole hospital as well as the medical level of the disciplinary team." (Expert F)

"The level of medical treatment and scientific research varies, so young doctors need to continuously strengthen their clinical and scientific research capabilities to improve the overall medical level in China further." (Expert H)

(5) Operational efficiency

In 2019, the National Health Commission issued the Opinions on Promoting the Sustainable and Healthy Standardized Development of Socially Run Medical Institutions, a national policy direction to encourage social capital to run non-profit medical institutions and support the operation of for-profit medical institutions. The competition in the medical market will become increasingly fiercer, and the transformation of Chinese public hospitals from "expanding scale" to "pursuing high efficiency" is more in line with the current DRG/DIP payment reform. Improving the operational efficiency of public hospitals is a must for public hospitals to survive in the competition.

"This is beneficial for hospitals to control costs, and many hospitals often neglect the delicacy management of bed resources." (Expert C)

"We cannot set evaluation criteria by data alone. In the case of insufficient allocation of human resources and equipment, in order to ensure the turnover rate, hospitals have to admit patients who have short hospital stays and fast turnover rates." (Expert E)

"The core element of high-quality development is the core competitiveness, or to be specific, economic and scientific modern management, high-quality and safe medical services, efficient and low-consumption hospital operations, people-oriented medical innovation, and a team of talents with both capability and merit." (Expert G)

"Scale is the cost, efficiency is the benefit, and medical quality has little to do with either." (Expert H)

"Adjusting the structure, controlling the cost, and improving the efficiency are crucial. Adjusting the income structure for different diseases is also fundamentally important." (Expert H)

"Our performance-based pay is among the highest in the acceptable range because that is the only way to retain talents. Medical care is all about talents; without talents, we have no competitiveness."(Expert I)

(6) Hospital brand

A good hospital brand can represent its image in the minds of patients. It can help them understand the hospital, recognize its medical quality and service, and at the same time, judge their interests and risks and defend their rights. For hospitals, having their brand can attract more patients, which is essential for hospitals to create benefits. The brand enables hospitals to enhance their image and improve their brand awareness and influence.

For arthritis hospitals, the diseases they treat are generally chronic, and patients will choose hospitals and specialists for treatment, with reputation and brand acting as the decisive factors. With the increasing competition in the medical market, hospitals can only stand out if they establish a good brand image.

"When I came to the hospital, the first thing I do is to polish the brand. Even good wine needs bush. Our overall strength is undoubtedly good, but the brand promotion is still unsatisfactory. We have no in-depth understanding of the brand of our hospital. The establishment of brand image is to present all our accumulation, our connotation, and our spirit to the public". (Expert A)

"In the hospital image establishment, we need to do only one thing, that is to build our brand." (Expert C)

"Now we hold a lot of large academic conferences, and that is because we have built our brand." (Expert E)

"The building of the brand is the focus of hospital construction. It includes the differentiated development and development of some departments and teams, which is the idea of building a specialized hospital." (Expert H)

"The promotion of the brand will bring many benefits. First, it helps expand the hospital's influence; second, it strengthens the competitiveness of the discipline and the hospital."(Expert I)

"The development of the brand can take another way, that is, to form the brand from scientific research, and this is also a way to enhance the hospital's competitiveness." (Expert J)

(7) Hospital culture

With the continuous reform of China's medical system, the hospital development model is also undergoing profound changes. Among the many medical models, the cultural building has been the core element of hospital development. With the rapid development of the market economy, traditional ideas and concepts have been impacted, and hospital culture development also needs to keep pace with the times. Only by strengthening hospital culture building can we maintain the core competitiveness of the hospital.

Hospital culture is the staff's recognition of the hospital's mission and vision goals, and it is the staff's heartfelt compliance with the hospital system and the guardianship of the hospital's conventions and customs. An excellent cultural atmosphere can promote the rapid growth of talents. Creating a solid cultural atmosphere and work atmosphere can enhance employees' sense of mission, responsibility, and belonging.

Of course, the building of hospital culture only happens after some time. It requires long-term efforts from employees, so attention should be paid to guiding employees to understand the relationship between hospital culture and values. Hospitals need to develop a series of scientific management systems. For example, hospitals need to develop a reasonable and scientific salary distribution policy to improve the enthusiasm and stability of the medical and nursing staff. Hospitals need to pay attention to humanistic care so that employees feel the sense of value and pride brought by the existence and development of the team. Hospitals need to pay attention to the building and promotion of hospital culture and improve the hospital cultural atmosphere. Hospitals also need to strengthen the incentive mechanism, establish a scientific evaluation system, improve the reward mechanism, and establish a long-term training and learning mechanism to create an excellent cultural atmosphere. In addition, democratic discussions should be carried out with the employees to achieve the education and publicity of the hospital's philosophy, purpose, and objectives.

"We should use the culture to improve our medical philosophy. Often such a cultural atmosphere will affect a region. For example, our hospital carries much weight in the minds of the local people due to its previous accumulation and the long-term impact of hospital philosophy and culture. For the staff, they have the determination to do something well." (Expert A)

"Hospital culture is something that everyone agrees consciously to comply with. It can increase the sense of identity and cohesion for the employees and has a promoting effect on the team and the development of the hospital." (Expert D)

"Led by Party building, guaranteed by the hospital system, we can foster a culture in which hospital staff can consciously and spontaneously comply with the rules and regulations." (Expert H)

"At the hospital level, I think the more important thing is to build a culture, an atmosphere, and maybe the more important thing is the sense of mission and the sense of responsibility, and we quickly incorporate it into the hospital system through the culture of our department." (Expert H)

4.4 Building a model for the strategic development of arthritis hospitals

In the previous interview, the author briefly summarized the dimensions of arthritis-specialized hospitals' dynamic capabilities, including environmental perception capability, organizational learning capability, organizational change and innovation capability, organizational flexibility, and the building of strategic barriers. Under each dimension, there are specific sub-components, and this study shows that building dynamic capabilities can be done from the above five perspectives. Subsequently, the study also reviewed the manifestations of the core competencies of arthritis hospitals, including medical quality, preponderant disciplines, talent echelon, operational efficiency, hospital brand, and hospital culture. The development strategy of arthritis hospitals can be centered on the core competence, and the dynamic capabilities can be used as the driving force to integrate and reconfigure the existing advantageous resources. It is found in the study that the following propositions are embedded in this process.

Proposition 1: Arthritis hospitals with abundant advantageous resources and capabilities are more likely to obtain a competitive advantage.

Based on the resource-based theory and enterprise capability theory, this study considers arthritis hospitals as an integration of resources and capabilities, in which valuable resources and capabilities can create value and generate benefits for the hospitals or reflect the values or visions of the hospitals. In addition, the resources and capabilities can help the hospitals establish specific competitive advantages and core competencies. Generally speaking, their valuable resources and core competencies are above the industry average in external competition. For arthritis hospitals, tangible resources include geographic location, hospital scale, facilities and equipment, scientific research platform, and talent echelon. In contrast, intangible resources include hospital brand, specialty capability, operational efficiency, and culture.

From the inductive analysis, it is concluded that in terms of geographic location, all the ten case hospitals are located in municipalities directly under the central government, provincial capitals, or prefecture-level cities with strong economic power. They all have convenient transportation, and their services can cover the surrounding cities and regions. According to the layout of China's public hospitals, county-level and prefecture-level public hospitals undertake local basic medical security tasks, most of which are general hospitals. The resources are comprehensively allocated to each discipline according to the government's demand for hospitals, and it is difficult for the preponderant disciplines to obtain concentrated investment. For arthritis hospitals, their major tasks are not to protect basic medical security but to highlight

the specialties' advantages to meet patient's needs for the treatment of challenging and complex diseases. Due to convenient transportation in large cities, the hospitals are more capable of attracting patients with the exact needs in the region or across the country.

In terms of hospital scale, equipment, and facilities, the situations vary among the ten hospitals, and all of them have multiple hospital campuses. Among the general hospitals including West China Hospital, Sichuan University (from now on referred to as West China Hospital), Xiangya Hospital of Central South University (from now on referred to as Xiangya Hospital), Longhua Hospital affiliated with Shanghai University of Traditional Chinese Medicine (from now on referred to as Longhua Hospital), Shanghai Ninth People's Hospital, Shanghai Jiaotong University School of Medicine (from now on referred to as Shanghai Ninth Hospital), The First Affiliated Hospital of Xinjiang Medical University, and The First Affiliated Hospital of Guangzhou University of Traditional Chinese Medicine, their Departments of Orthopedics generally have about two to five wards and more than 200 beds. Although the orthopedic departments are the key specialties in these hospitals, the hospitals also need to balance the synergistic development of various departments to enhance the overall strength. As for the arthritis specialized hospitals such as Foshan Hospital of Traditional Chinese Medicine, Xi'an Honghui Hospital in Shaanxi Province, Wendeng Osteopathic Hospital in Shandong Province, and Henan Provincial Orthopedic Hospital (Luoyang Orthopedic-Traumatological Hospital of Henan Province), their Departments of Orthopedics (Orthopedic Injury) generally have ten to thirty wards with 1,000 to 2,000 beds. The development direction of arthritis-specialized hospitals is to expand the scale of orthopedics (orthopedic injury) and give full play to the characteristics of the specialty to gain a competitive advantage. The development of general departments is only supplementary to ensure the development of orthopedics. The facilities and equipment in the above ten hospitals are also relatively complete, almost meeting demands in the entire process of arthritis treatment from diagnosis, treatment, surgery, and rehabilitation. Even cutting-edge joint surgery robot has gradually been equipped in several hospitals. Arthritis hospitals have specific requirements for hospital scale and equipment, and facilities, and allocating these resources can also bring the corresponding competitive barriers and competitive advantages for the hospitals.

Talent is the source of competitiveness and the carrier for medical technology and services. In terms of the talent echelon, each hospital has its unique resources. Excellent disciplinary leaders and reasonable talent echelons are indispensable advantageous resources and capabilities. Excellent disciplinary leaders can support a whole team, such as Professor Shi Qi of the Department of Orthopedics in Longhua Hospital, who was awarded the honorary title of

"Master of Chinese Medicine" in 2022 in recognition of his outstanding contributions to the development of Chinese medicine. The clinical treatment, teaching, and scientific research of the Department of Orthopedics of Longhua Hospital can only be achieved with the leadership of Professor Shi. Take the Academician Dai Kerong of Shanghai Ninth People's Hospital as another example; he is a famous expert in orthopedics and orthopedic biomechanics in China and was selected as the Chinese Academy of Engineering academician in 2003. He has made outstanding contributions in the fields of artificial joints, biomaterials, and bone regeneration and repair. Under the leadership of Academician Dai, the Department of Orthopedics in the Shanghai Ninth People's Hospital has established several research and transformation supporting platforms, including the Shanghai Key Laboratory of Orthopedic Endophysiology and the Bone and Joint Research Center of Shanghai Jiao Tong University. It has become a first-class discipline in China.

All of the above are elements of tangible resources. Overall, hospitals with favorable geographical locations, convenient transportation, relatively large scale, well-equipped facilities, excellent disciplinary leaders, and reasonable talent echelons are more likely to gain a competitive advantage in the industry. It is also clear that the case hospitals are all leaders in arthritis and the first choice for arthritis patients.

Proposition 2: Arthritis hospitals with good hospital brands, specialty capabilities, and operational efficiency are more likely to have core competencies.

Hospital culture and hospital brand are a reflection of the hospital's internal cohesiveness and external appeal. Among the ten case hospitals, their hospital cultures are also different from each other. For example, as one of the largest hospitals in China with a history of more than 100 years, the West China Hospital has always presented devotion to family and country in its culture, and in the 2008 Wenchuan earthquake, the West China Hospital took the initiative to participate in the earthquake relief fully. The West China Hospital also shows concern for civilians in its culture. The hospital has always been positioned to offer medical service for the grassroots people in the southwestern and western regions of China and even the border areas. Another feature of its culture is tolerance and lenience. The West China Hospital was the first medical institution to support the standardized training of resident physicians nationwide. It also established a public technology platform-sharing mechanism within the hospital, combining individual leadership with teamwork. The fourth feature of its culture is innovation. The hospital has always taken innovation as the first driving force. Even in Southwest China, where resources are scarce, and conditions are complex, it has been able to pursue self-renewal unremittingly. The establishment of hospital culture, on the one hand, can strengthen internal

unity and improve internal efficiency; on the other hand, it can promote the formation of the hospital brand and help the hospital establish a competitive advantage.

Building a brand in the medical business may take much work for the emerging disciplines of hospitals. A hospital brand, by tradition, is acquired over the years through the efforts of several generations and decades of struggle. The Luoyang Orthopedic-Traumatological Hospital of Henan Province uses the local media, Dahe Daily, to promote its excellent deeds, new technologies, and new businesses to shape its image and raise its awareness. Shaanxi Province Xi'an Honghui Hospital has set up a public relations office and publicity section, aiming to rely on the major media to promote its brand, build its reputation and develop brand loyalty. The Foshan Hospital of Traditional Chinese Medicine in Guangdong Province has adopted the approach of placing equal emphasis on brand building and business promotion, exploring new, unique, orphan, and targeted drugs from some significant and challenging diseases. It builds its brand from the scientific research of new drugs and uses the brand to promote business development. All of these approaches can effectively help hospitals build a competitive advantage.

Operational management capability is an essential aspect of high-quality hospital development. Scientific, standardized, delicacy and information-based management can help public hospitals solve the problem of being unable to make ends meet and are a critical factor in forming a healthy hospital operation. In particular, public health emergencies can test the manager's operational management capability. Among the case hospitals, Foshan Hospital of Traditional Chinese Medicine in Guangdong Province turned a loss into a profit within one year through full cost accounting and performance reform in 2012 when the hospital was in debt. By 2018 the hospital had a cash balance of hundreds of millions of RMB, which also helped the hospital to survive the difficult times of public health emergencies.

Similarly, the operational management of Xiangya Hospital follows the guiding ideology of "adjusting structure, controlling cost, improving efficiency, preserving the basics, tapping potential and opening new sources," continuously optimizes the allocation, utilization, and output of human, financial and material resources, and gradually improves the overall operational efficiency of the hospital. On the other hand, it adheres to the principle of "do more with less, more pay for more work, and more pay for better performance," continuously optimizes the performance allocation plan and gives full play to the leverage of performance allocation. During the COVID-19 epidemic, there was no loss, which shows that the hospital's operational management can help it establish a competitive advantage.

The above several aspects are the intangible resources of the hospitals. Given the

aforementioned tangible resources, we can find that hospitals have different advantageous resources and capabilities, which aligns with the VIRO in the resource-based theory. These resources need to be identified and organized to form the core competitiveness of a hospital. Hospitals with valuable resources that can organize their core competitiveness are more likely to gain a competitive advantage.

Proposition 3: Hospitals with good medical quality, reasonable talent echelon, and solid scientific research innovation ability have more substantial core competitiveness.

Medical quality management is an important initiative for public hospitals to serve the health needs of the people, and medical quality in public hospitals is a collection of medical technology capability, medical safety assurance, and medical service attitude. The medical technology capability of an arthritis hospital is reflected in the treatment of joint diseases on the one hand and the ability to treat complex and challenging internal medicine diseases on the other. For arthritis, surgical techniques are the most intuitive manifestation and the mainstream direction of modern medical development. The integrated support capability reflects the hospital's "disaster tolerance" ability. With the aging of the population, patients more or less have internal medicine concomitant disease. The development of arthritis specialty must be distinct from the synergistic development of comprehensive departments. Otherwise, there will be problems in dealing with medical complications, as arthritis doctors are challenging to receive patients with difficult and complex diseases. It could be more conducive to the expansion of the scale of the hospital, and it will be challenging to ensure medical safety. In this study, all four non-general hospitals encountered such problems, and many patients were asked to transfer to other hospitals for treatment due to a lack of integrated support capability, which exerts tremendous pressure on doctors to ensure medical safety and is not conducive to the treatment and recovery of the patients. The weakly integrated support capability is a bottleneck for the business development of non-general hospitals. The four hospitals have also realized this problem in recent years and tried to compensate for this weakness by training talents internally and bringing in externally to achieve a more stable development. In the case of technology popularization, medical service construction is a soft power enhancement measure carried out by each hospital. When the ability to treat a disease within a region tends to be homogeneous, hospitals with exemplary medical services will be favored by more patients. In this study, the development of ERAS (enhanced recovery after surgery) (shown in Figure 4.8), led by the Department of Orthopedics of West China Hospital, is a renewal of medical philosophy and a breakthrough in medical technology and medical services. ERAS is a multimodal perioperative care pathway designed to achieve early recovery for patients

undergoing major surgery. The development of ERAS can significantly improve the utilization of medical resources and reduce the complications of inpatients and the mortality caused by non-technical reasons. It also has an excellent effect on doctors' philosophy and technical training. This project has also received the attention of the national health administrative departments and industry associations. The West China Hospital is one of the earliest hospitals researching ERAS. Its research is the most profound, so it has earned the right to formulate relevant guidelines and standards, which helps it form its core competitiveness.

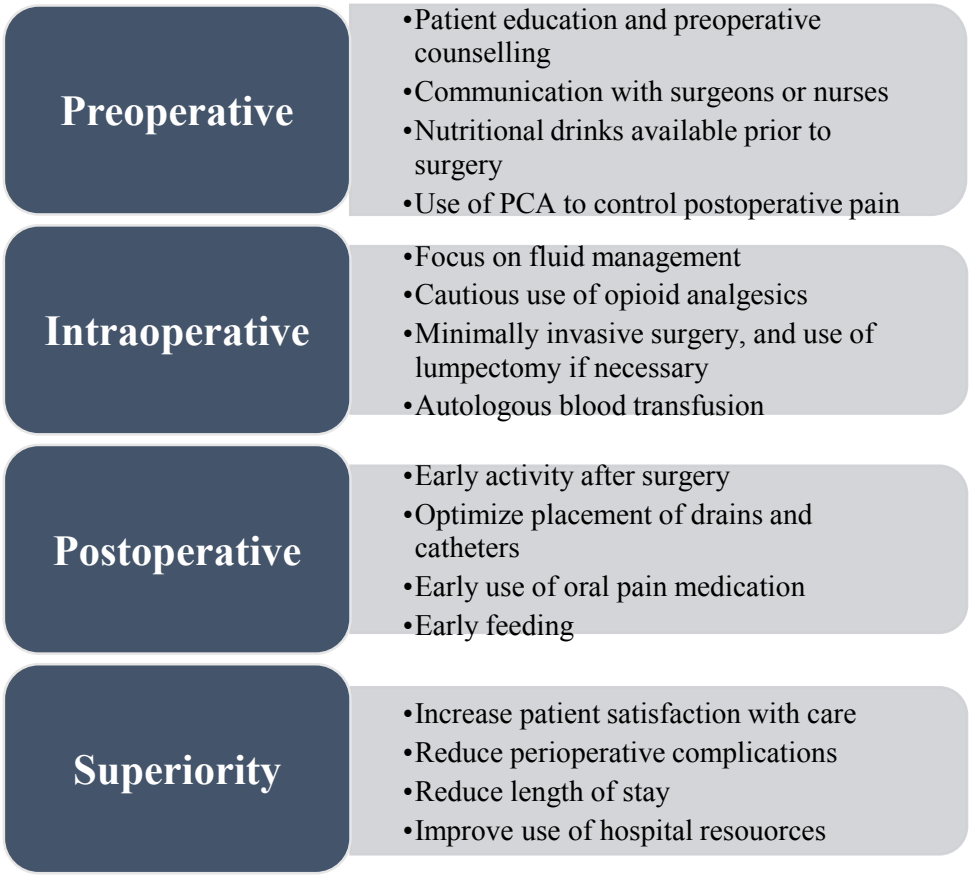

Figure 4.8 A brief implementation process for ERAS

A reasonable talent echelon is inseparable from the hospital's clinical teaching culture and talent training system, and it is also a guarantee for the hospital to establish a sustainable competitive advantage. The hospital relies on the advantage of medical quality to seize the first opportunity to fight for the time for development. However, the hospital will lose its competitive advantage if there are problems in developing talent echelon and talent training. As the old saying goes, sitting on a throne is a thousand times harder than winning one. In this research, the ten case hospitals all cooperate with local medical schools and are all university-affiliated hospitals undertaking teaching tasks. In addition, they have organized and held training courses in arthritis for doctors across the country. As the first hospital to promote

standardized training for resident physicians, the West China Hospital is also among the first batch of medical institutions to carry out specialized pilot training, advocate medical training featuring "three basics and three districts," and require all residents to rotate among all disciplines, aiming to ensure the medical quality and safety. As a university teaching hospital, the master's and doctoral candidates trained by the hospital are also the main force of scientific research.

Scientific research and innovation is a crucial strategy to meet the changing health needs of the people and is also a shift from the pursuit of "quantitative" expansion to the pursuit of "qualitative" improvement in public hospitals. For national strategic needs and significant scientific issues in the healthcare industry, we should strengthen basic and clinical research and promote the absorption of cutting-edge technologies and the development of original technologies. The transformation of scientific and technological achievements and incentives for researchers who have made significant contributions are the major initiatives of scientific innovation. In this case, the research of the four non-general hospitals faces the dilemma of unbalanced development. The managers generally believe that lagging in research innovation will lose a head start in future competition, so they have increased the incentives for academic articles and scientific and technological achievements. For example, academic papers published in SCI journals are rewarded. Accordingly, teams receiving research projects will receive matching funds, and teams making scientific and technological achievements will be recognized and rewarded. The arthritis-specialized hospitals featuring Chinese medicine start with the characteristic treatment plan of Chinese medicine, transform and form several Chinese medicine equipment, medical devices, or new drugs of Chinese medicine, give play to the characteristics of Chinese medicine, carry out the diversified competition and build their core competitiveness.

From the above three points, the core competitiveness of arthritis hospitals is built on three dimensions medical quality, talent echelon, and scientific research innovation. From the perspective of static thinking, the hospital's valuable resources need to be integrated and focused on these three points. However, from the perspective of dynamic competition, the hospitals' medical treatment, teaching, and scientific research are not static. The hospitals need to adjust their core competitiveness according to their development stage and changes in the external environment, which is the process of building dynamic capabilities.

Proposition 4: Arthritis hospitals with strong dynamic capabilities are more likely to obtain a competitive advantage.

In the traditional resource-based theory and enterprise capability theory, the valuable

resources of the organizations can be transformed into competitive advantages. However, due to the drastic changes in the external environment nowadays, the core competencies of arthritis hospitals are not static. Hospitals must also have the dynamic capabilities to adjust their internal resources and capabilities quickly, integrate and reorganize their valuable resources, and build new core competencies to respond to environmental changes and establish a sustained competitive advantage.

This study will elaborate on the building of dynamic capabilities of arthritis hospitals from five dimensions: environmental perception capability, organizational learning capability, organizational change and innovation capability, organizational flexibility, and the building of strategic barriers.

(1) Environmental perception capability

Environmental perception capability is the primary dimension in building dynamic organizational capabilities, and it reflects the hospital's foresight when conducting a strategic analysis. Strategic foresightedness is to see the trend of external environmental changes in advance, namely, to know ahead of time and to think ahead. It is "knowledge in advance" and "reasonable imagination." The environmental perception capability of an arthritic hospital is reflected in the analysis of changes in patient needs, the national policy orientation in medical reforms, the development of new medical technologies, the development of regional competitors, and the development of relevant stakeholders in the field of arthritis.

Environmental perception capability has played an essential role in the cases of this study. For example, the orthopedic department of the First Affiliated Hospital of Xinjiang Medical University started to apply the MAKO joint surgery robot as early as 2018, which is the first in China in terms of environmental analysis, field investigation, and procurement. After introducing the new technology, the hospital immediately started a simulation operation and initiated a clinical trial of medical devices in China in conjunction with Stryker USA to verify their effectiveness and safety and obtain a legal qualification for usage. After consultation with the medical insurance and price departments, the charges for the surgical robot were approved. On the one hand, it protects patients' precise surgery. On the other hand, it facilitated the hospital to earn economic benefits and promoted the formation of its brand. With the exacerbation of the trade dispute between China and the United States, there are more restricts on the purchase of sizeable foreign equipment, and there is still a gap between the foreign equipment and domestic substitution, so the hospital has gained a competitive advantage. Shaanxi Province Xi'an Honghui Hospital in Shaanxi Province has introduced competitive benchmark analysis. It compares its business indicators with Beijing Jishuitan Hospital

annually to check for gaps. It draws on the system of the benchmark hospital to foster hospital culture to gain a competitive advantage in northwest China. In response to local policies, the Luoyang Orthopedic-Traumatological Hospital of Henan Province has expanded from a prefecture-level city to the provincial capital and established the Zhengzhou campus, a relatively rare public pattern hospital expansion. By taking advantage of the economic and transportation advantages of the provincial capital and giving full play to the brand appeal of the hospital, it has gained a competitive advantage. Shandong Wendeng Osteopathic Hospital analyzes patient needs, disease types, and business changes over the past ten years. Judging from the changing trend, it has expanded the scale of the departments related to degenerative diseases associated with geriatrics and controlled the scale for the reduced trauma-related business, thus doing an excellent job in cost control.

The First Affiliated Hospital of Guangzhou University of Traditional Chinese Medicine analyzes the interests of medical equipment suppliers in the state-organized volume-based procurement of artificial joints, gives certain preferential conditions in the approval of new devices, reduces the risk of discontinued supply, guarantees stable supply, and satisfies the health needs of patients and hospital benefits.

Environmental perception capability requires organizations to conduct macro environment and stakeholder analysis regularly and make decisions and judgments on future trends based on the managers' broad insight and knowledge accumulation. Environmental perception capabilities provide dynamic capabilities for arthritis hospitals.

(2) Organizational learning capability

Organizational learning capability provides the source of motivation for change within an organization. Organizational learning refers to the various actions taken by an organization around information and knowledge skills to achieve development goals and improve core competencies, as well as the process in which an organization constantly updates itself to adapt to a continuously changing environment. In arthritis-specialized hospitals, the organizational learning capability is reflected in medical business learning within the hospital, domestic and international academic conferences, standardized and specialized training for young physicians, and further study at home and abroad.

In this study, all hospitals have carried out different forms of organizational learning, and almost all hospitals have internal medical business learning mechanisms, including routine preoperative discussions and literature studies. Some hospitals also carry out focused discussions and learning based on clinical problems. The innovative mechanism at West China Hospital lies in its medical quality management. Since surgeons have different levels in their

skills, postoperative discussions and pre-discharge case discussions are carried out in the orthopedic department, mainly to review the problems that occur during surgery and summarize and prevent possible near-term and long-term complications to ensure medical quality. In addition, the West China Hospital also conducts a centralized reflection meeting for medical problems and errors, which requires participants to speak freely and review and reflect on defects, errors, and unexpected situations that occur in the treatment of patients during their hospitalization. The Shanghai Ninth People's Hospital has adopted the method of discussing complex surgeries to improve learning efficiency. Academic conference exchange is one of the main ways for physicians to access the latest research advances and trends, and holding and participating in academic conferences contribute, to some extent, to the organization's environmental perception. Almost all the hospitals where the interviewed experts work are devoted to holding relevant academic conferences to create academic brands and expand their influence within the industry. The training of young physicians is an essential manifestation of the competence transmission for an arthritis hospital, and it is also the basis for the construction of a talent echelon. Currently, the national standardized training for resident physicians has been implemented in China, while the training for specialist physicians is still being carried out on a pilot basis. Longhua Hospital, Shanghai Ninth People's Hospital, West China Hospital, and Xiangya Hospital are all specialist physician training bases, and they have gained competitive advantages in talent training. The Department of Orthopedics of the First Affiliated Hospital of Guangzhou University of Traditional Chinese Medicine emphasizes that their talent training needs to learn from the best departments and hospitals. In the initial stage of new business development and new sub-specialty construction, disciplinary leaders need to be sent to the best hospitals in related fields at home and abroad for further learning. They need systematic rather than superficial learning. Through further learning, the doctors can improve their medical technology and learn the benchmark hospital's management style, process design, and other related knowledge. The hospital can gain a more sustained competitive advantage by sending employees for systematic learning.

From the above points, organizational learning capability embodies the motivation for internal renewal in arthritis hospitals. With the right direction determined, establishing a learning system and incentive mechanism can help hospitals gain core competitiveness and competitive advantage.

(3) Organizational change and innovation capability

Organizational change and innovation refer to the use of management methods to make purposeful and systematic adjustments and innovations to the organization's power structure,

organizational size, communication channels, role setting, relationships between the organization and other organizations, as well as the perceptions, attitudes, and behaviors of the organization's members and their teamwork, to adapt to changes in the internal and external environment, technical characteristics and organizational tasks of the organization and improve organizational effectiveness. For arthritis hospitals, organizational change and innovation capability are reflected in the segmentation and integration of orthopedics sub-specialties, scientific research innovation, development of new business and new technology, a culture of innovation and change, and the establishment of strategic alliances.

Sub-specialty segmentation is a sign of in-depth disciplinary development and reflects the ability of a discipline to solve complex, challenging, and specific problems. In this study, the interviewees' hospitals all make proactive business adjustments in response to changes in the external environment. In segmenting orthopedic sub-specialties, all hospitals divide sub-specialties according to the volume of business. However, coercive segmentation can lead to short-term changes in the performance of departments and individuals, and the enthusiasm of the medical staff will be affected. Hospitals have different ways of sub-specialty segmentation. For example, the Luoyang Orthopedic-Traumatological Hospital of Henan Province and Xi'an Honghui Hospital in Shaanxi Province advocate orientation of sub-specialty segmentation first, in which the external name of the department will be changed first. However, the department's business is not affected by the changed name. Other surgeries can also be carried out in this new department, and the hospital gradually guides the application of sub-specialty segmentation. In the practical application, the original department members can still carry out surgeries that do not belong to this sub-specialty for a certain period. However, the new staff has to follow the segmentation of the sub-specialty.

On the one hand, this method will not inhibit staff motivation; on the other hand, it can progressively achieve segmentation of sub-specialty. The practice adopted by the First Affiliated Hospital of Guangzhou University of Traditional Chinese Medicine is to review the type and number of surgeries in a year and then hold a meeting to adjust the segmentation of the sub-specialties of each disciplinary leader, such as opening digital orthopedics and bone tumor department in response to the development demand. In this case, all bone tumor patients are treated in the tumor sub-specialty, and the disciplinary leader of the tumor sub-specialty is required to give up the surgeries of other sub-specialties. Such a method also ensures fairness from the source. It encourages staff motivation and can promote specialty development.

Incentives for scientific research innovation and the development of new businesses and technology are a must for every hospital to comply with the requirements of high-quality

development. Most are based on performance incentives, rewarding teams that get government and business-related topics, or employees who publish academic papers in significant domestic and foreign journals and magazines. Research-based hospital reform is a competitive strategy that closely integrates clinical treatment and scientific research to make up for the fact that research institutions are far from clinical treatment, and clinical hospitals do not have the strength of scientific research and focus on clinical research. The West China Hospital, Xiangya Hospital, Longhua Hospital, Shanghai Ninth People's Hospital, and the First Affiliated Hospital of Guangzhou University of Traditional Chinese Medicine all build a platform integrating clinical treatment and scientific research, adhere to the development of disciplines, and strike a balance between clinical treatment and scientific research to achieve innovative development and creative transformation. Only by deepening scientific research based on clinical treatment can we enrich the connotation of the discipline and enhance its height of the discipline. In constructing a research-based hospital, we should focus on fostering the innovation culture of the hospital, improving the talent training mode, and building the talent echelon. Among the clinical team of the Shanghai Ninth People's Hospital, there is one academician of the Chinese Academy of Engineering, one member of the Talents Project, nine members of the National Key Research and Development Program, three members of the National Natural Resources Foundation of China, one member of the Young Thousand Talents Program, two members of the Shanghai Leading Talents, and five excellent academic leaders, and the per capita research funding amounts to 2 million yuan. In addition, the department also has 12 doctoral and 18 master's supervisors, which is already at the top level in China.

Establishing a specialty alliance is a way for organizations to integrate resources externally. Arthritis-specialized hospitals mainly establish cross-regional and cross-level specialty alliances, uniting local or foreign arthritis hospitals or grassroots general hospitals to enhance the treatment capability of solving major arthritis diseases. With its influence, the Xi'an Honghui Hospital in Shaanxi Province is preparing to establish the Northwest Orthopedic Alliance to consolidate and develop its competitive advantage. The development steps to build the specialty alliance are as follows work together with community health centers in Xi'an,cover all county hospitals in Shaanxi province, and cover all regional hospitals and county hospitals in Northwest China.Such a development model revitalizes the existing medical resources, highlights the unique characteristics of the hospital, and establishes a competitive advantage.

(4) Organizational flexibility

Organizational flexibility requires the organization to be highly flexible to respond quickly

to external changes and make strategic adjustments. Presently, talent management in most public hospitals is a strict management mode, which focuses on rigid indicators such as assessment and evaluation, incentive mechanism, training, and selection, which tends to ignore employees' personal development and emotional factors. Flexible management of human resources requires changing the hierarchical organizational structure and establishing an organizational framework that is particularly suitable for professionals to create value so that the core department of the organization no longer plays the role of giving orders. In the organizational structure of public hospitals, the organization should be streamlined, the management level should be reduced, and flat management should be implemented. The core of flexible management is "people-centered." Therefore, arthritis hospitals should make timely adjustments to the hospital structure and system, flatten the management structure, and mobilize employees' initiative to build organizational flexibility.

In this study, the orthopedic center of the First Affiliated Hospital of Guangzhou University of Traditional Chinese Medicine not only considers external incentives, namely material incentives but also gives full play to internal incentives, such as emotional, honorary, and career incentives and other flexible incentive policies. The orthopedic center meets the development needs and self-fulfillment needs of all employees, builds a platform for talents to display their talents fully, cultivates each employee with the standard of a "disciplinary leader," encourages medical personnel in the department to "play the leading role" and cultivates their "charisma." In addition, an atmosphere of respect for talents and technology has been formed, and assistance is offered to employees in professional title promotion, research project application, and honor evaluation, which can consolidate its talent echelon on the one hand and provide a suitable environment for the introduction of talents on the other. The First Hospital of Xinjiang Medical University is located in the western border area, and talents there are relatively scarce. The hospital's orthopedic department attaches importance to the training of young talents and does not set technical barriers for young physicians. All capable young physicians can carry out third and fourth-level surgeries with the assistance of senior directors so that their talents can give full play to their strengths. Luoyang Orthopedic Hospital, Foshan Hospital of TCM, and Wendeng Osteopathic Hospital have implemented the "responsibility by attending physician system" to flatten the management structure. The director no longer has the right to allocate performance-based salary, and the hospital directly manages the salary of the attending physicians, thus fully mobilizing the motivation of the staff. Hospital personnel management has been changed from traditional identity management to position management and from vertical administrative management to employment relationships featuring consultation based

on equality.

(5) Building of strategic barriers

Strategic barriers are not built overnight, nor are they the single core competencies of an organization. Traditional strategies are primarily static and lack a dynamic perspective. In arthritis-specialized hospitals, the core medical technology is the foundation for forming barriers; however, the accumulation of technological advantages requires the technology to conform to the development of medicine, thus forming barriers of scale and branding, which is the thickness of the strategic barriers. The strategy development for arthritis-specialized hospitals should focus on five aspects: promotion of intellectual property protection, continuous technological renewal, prevention of the loss of core staff, improvement of patient satisfaction, and establishment of hospital brand.

In the cases of this study, it is easy to find that hospitals building strategic barriers all take medical technology, medical quality, and medical safety as the most critical core competencies. In the past, the barriers were mainly in the form of physical barriers, which restricted other competitors in the region from visiting and learning or academic exchanges. This self-seclusion type of protection has lost its effect due to the rapid development of media and was abandoned by the ten case hospitals 10 to 20 years ago. It has become a consensus that the isolation of technology within a region does not create barriers and is detrimental to the brand and culture of the hospital because a lack of academic exchange will encourage staff to progress. The First Affiliated Hospital of Guangzhou University of Traditional Chinese Medicine encourages all department heads to go out for two to three weeks a year to update their ideas and improve their medical techniques. Only by amplifying technology's value and strengthening technological innovation's driving force can we gain a sustained competitive advantage.

The Luoyang Orthopedic Hospital attaches importance to the protection of intellectual property rights. With the encouragement of the hospital, the agreed prescriptions of senior experts are developed to launch more than 100 preparations. As they are exclusive products and have desirable efficacy, the Luoyang Orthopedic Hospital obtains a competitive advantage. Both the Luoyang Orthopedic Hospital and the First Affiliated Hospital of Guangzhou University of Traditional Chinese Medicine have experienced the loss of core staff in bulk, resulting in a short talent supply. For the entire discipline, the loss of the disciplinary leader or backbone staff will, to a certain extent, destroy the cohesion of the department. With the loss of core technology, the development process of the discipline will continue, and the medical business volume will also be reduced sharply. Therefore, it is crucial to prevent the loss of core staff. The First Affiliated Hospital of Guangzhou University of Traditional Chinese Medicine

encourages intra-disciplinary communication and sharing within the hospital and prohibits technology monopoly. In a sub-specialty, there must be more than two people mastering core technology. In addition, there are backups in management. When the director cannot perform management functions, the backup management staff will act as the proxy.

According to Shaanxi Province Xi'an Honghui Hospital, technical barriers are not essential in forming a "moat." Instead, scale and brand are crucial to building a competitive advantage. They believe that the technical barrier is only a tiny link. In contrast, the composition of the hospital's competitive barriers is a chain in which the internal management and external services of the hospital are impossible to imitate and replicate in a short time. The Luoyang Orthopedic Hospital also focuses on brand management and continues to strengthen its brand advantages. More patients and a larger scale support lower costs and efficient operation, which helps build the hospital brand, and the famous brand, in turn, attracts more patients to come to the hospital. This is the way to build a competitive barrier for the hospital, and it is also the way to gain a competitive advantage and dynamic capabilities.

Patient satisfaction is the most important concern for all hospitals and is a critical factor in the formation of brand loyalty. Patient satisfaction is related to many factors, mainly medical quality, safety, and services. As mentioned above, the West China Hospital conducts pre-discharge case discussions for patients, treats each patient's diagnosis and treatment carefully, and strives for perfection. This process ensures medical quality and medical safety. The Xiangya Hospital has also carried out a "100-day special action" for regular or irregular self-examination and self-correction of medical service attitudes in clinical departments. It hires third-party supervisors to collect opinions monthly and holds a symposium every six months to collect opinions and suggestions on medical service attitudes from all walks of life. It introduces an intelligent evaluation system and sets up evaluation facilities at relevant service windows to collect patient feedback data on-site. It regularly appraises and selects the most outstanding employees, creates positive examples, and consciously guides the staff to practice the codes of conduct. It strictly implements reward and punishment mechanisms and regularly announces the service attitude supervision and complaint results. The combination of measures has dramatically improved the satisfaction of inpatients and the hospital's reputation in the public's hearts.

By analyzing the above five essential competencies, this study proposes a specific analysis framework from the connotation of dynamic capabilities of arthritis hospitals. The trend and direction of development are obtained from the environmental perception capability, the motivation of development is obtained from the organizational learning capability, the reduction

of obstacles to development is obtained from the organizational change and innovation capability, and the organizational flexibility resolves the contradictions of development. The protection of development is obtained from the building of strategic barriers. That is, the proposition that arthritis-specialized hospitals with strong dynamic capabilities are more likely to have a competitive advantage is supported.

Proposition 5: Arthritis hospitals that adhere to the characteristics of arthritis treatment and make concerted efforts to develop comprehensive disciplines are more likely to gain a competitive advantage.

Most Chinese public hospitals have been making trade-offs between specialized and general hospitals in their development process. In the past, many secondary hospitals wandered in the development, becoming neither characteristic specialized hospitals nor general solid hospitals, so they gradually fell behind in the development and ended up being merged or transformed. With the proposition of the development strategy of "large specialty departments and small comprehensive departments," many secondary hospitals and private hospitals were inspired to start a large-scale reform of hospital departments, with resources prioritized on the development of specialties. From the perspective of external competition, this development model is mainly designed to differentiate itself from large public hospitals to create their characteristics and gain competitive advantages.

The four arthritis-specialized hospitals in this research all started from the development strategy of "large specialty departments and small comprehensive departments." For example, the Zhengzhou Campus of Luoyang Orthopedic Hospital expands its scale from the prefecture-level city of Luoyang to the provincial capital of Zhengzhou, which is an upward development model and usually encounters more resistance. However, the hospital gives priority to the development of its specialties, concentrates its valuable resources to guarantee the prioritized development of arthritis-related disciplines, and expands the scale of business from the source, and the economic benefits obtained are, in turn, used for the construction and development of comprehensive departments, thus enhancing its comprehensive strength. As a result, it can compete with other large regional public hospitals and gain a competitive advantage.

With the gradual expansion of scale, the hospital administrator made another strategic adjustment and proposed the development strategy of "large specialty departments and strong comprehensive departments" or "strong specialty departments and large comprehensive departments." In other words, based on the advantageous arthritis specialty, the hospitals focus on expanding and strengthening the comprehensive specialties. Among the case hospitals, Shaanxi Province Xi'an Honghui Hospital has stabilized the size of its osteoarthropathy

department at three specialized orthopedic hospitals within a hospital (spine surgery hospital, joint surgery hospital, and trauma surgery hospital) and three osteoarthropathy sub-specialty centers (sports medicine center, hand surgery center, and foot and ankle surgery center). After stabilizing the development of the osteoarthropathy department, the hospital begins to develop comprehensive departments such as surgical anesthesiology, critical care medicine, rheumatology, rehabilitation, internal medicine, and pediatrics. The development of surgical anesthesiology and critical care medicine is designed to provide integrated support for patients with complex and challenging surgeries and protect patients with perioperative co-morbidity to ensure their medical safety so that they do not need to be transferred to other hospitals. The development of rheumatology guarantees the continuity of rheumatology treatment when rheumatology patients are treated in the osteoarthropathy department. The development of pediatrics is to prepare for the establishment of pediatric orthopedics.

The development of broad disciplines can also be carried out in the mode of "specialized disease" treatment. The Foshan Hospital of TCM is a good case in point. After the scale of its orthopedic surgery department has been stabilized, it takes the treatment of a few specialized diseases as the advantageous business and focuses on the development of specialized disease disciplinary groups. Foshan is the hometown of martial arts in modern China, and many outstanding historical and cultural celebrities such as Ip Man, Bruce Lee, and Wong Fei-hung grow up in Foshan, so the local non-surgical treatment methods related to bruises and injuries are well-known nationwide. The hospital focuses on developing orthopedic injury specialties, such as manual repositioning, surgical treatment, postoperative rehabilitation driven by traditional Chinese medicine, acupuncture and massage, ointment fumigation, and other traditional Chinese medicine treatment methods. Gradually a specialized orthopedic injury discipline group has been formed, which drives the development of comprehensive departments.

Shanghai Guanghua Hospital has also encountered such a dilemma in its development. More than ten years ago, the hospital was in a difficult situation, and once it was going to be reorganized and merged, or reformed with pharmaceutical enterprises in a mixed ownership system. The hospital concentrated its valuable resources on specialty development to turn losses into profits. By adopting the strategy of "large specialty departments and small comprehensive departments," many marginal disciplines unrelated to the central business were abolished. Later, through the strategy of "large specialty departments and strong comprehensive departments," rheumatic arthritis was taken as the hospital's critical specialty to introduce and gradually develop other comprehensive support departments. In January 2013, it passed the State Administration of Traditional Chinese Medicine evaluation and became a grade A tertiary

hospital of integrative medicine. In February 2017, it passed the evaluation of the Shanghai Municipal Education Commission. It became the eighth affiliated hospital of the Shanghai University of Traditional Chinese Medicine, successfully transforming itself from a secondary general hospital to a grade A specialized tertiary hospital.

From the above cases of each hospital, it is easy to see that maintaining the prioritized development of the arthritis specialty is the key to the survival of the arthritis-specialized hospitals, and for the general hospitals, maintaining the characteristics of the arthritis specialty is also an important move to gain a competitive advantage, which is supported by this study.

Through the above analysis, this study validates the theoretical model proposed in Chapter 2 and further revises it to elaborate on the connotation of dynamic capabilities. A model for the development strategy of arthritis-specialized hospitals based on dynamic capabilities is constructed as per Figure 4.9.

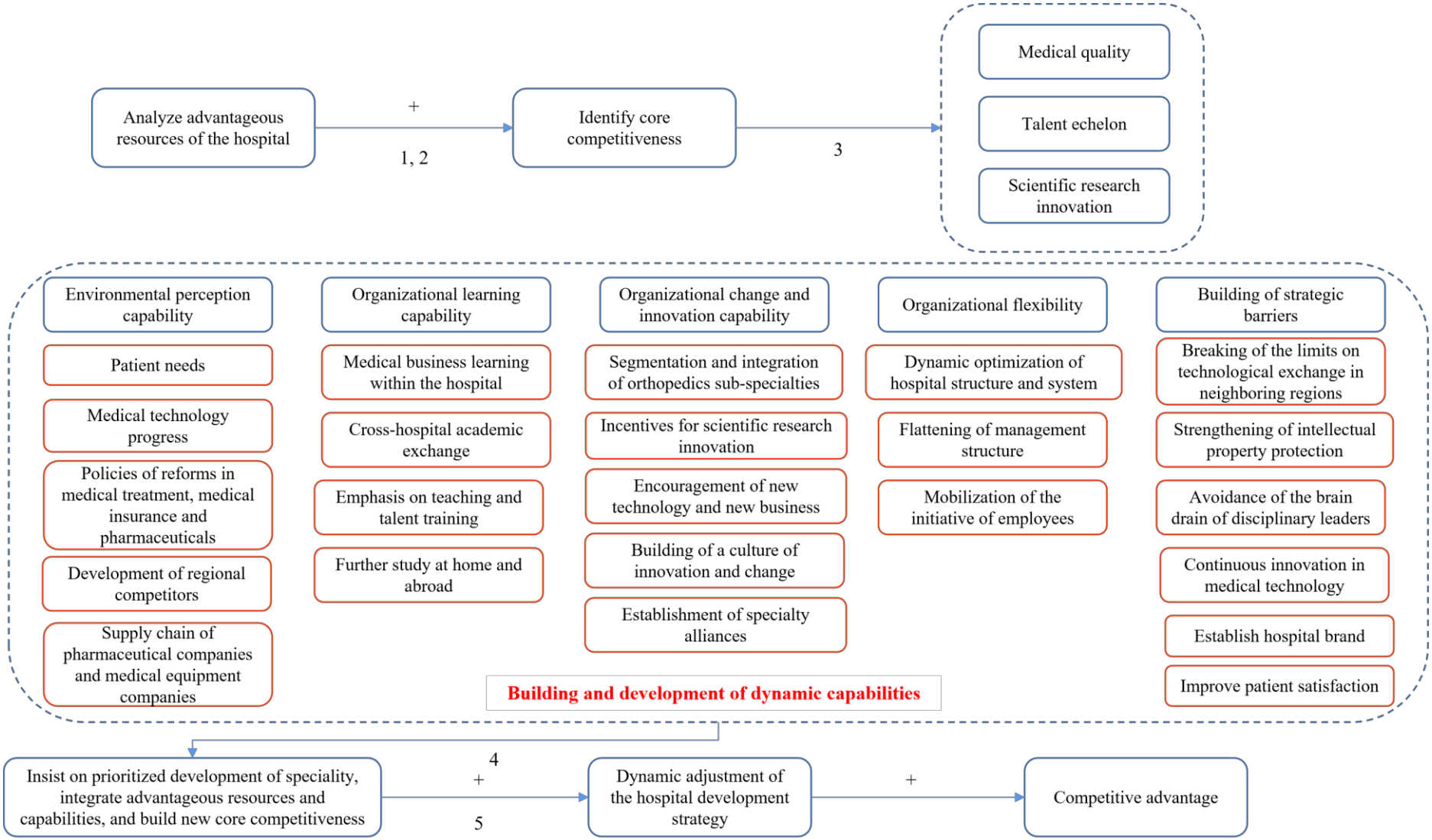

Figure 4.9 A model for the development strategy of arthritis specialized hospitals based on dynamic capabilities

The above five propositions mainly describe the development strategy of arthritis hospitals based on dynamic capabilities in an environment of uncertainty. The primary task of an arthritic hospital facing an uncertain environment is to analyze its valuable resources and identify core competitiveness from them (Propositions 1, 2). The core competitiveness is usually cultivated in three aspects: medical quality, talent echelon, and scientific research innovation (Proposition 3). This analysis provides an understanding of the hospital's internal environment, after which the strategic analysis can be carried out based on the internal resources and capabilities. However, the core competitiveness of a hospital is not static. It may change with changes in the macro environment, such as policy, economy, demographics, technology, or stakeholder needs. In this uncertain environment, dynamic capabilities are needed to rebuild core competitiveness and competitive advantages (Proposition 4). Dynamic capabilities can be divided into five dimensions. With the environmental perception capability, we can analyze medical reform policies, the macro environment, and relevant stakeholders to identify the direction of hospital development. With the organizational learning capability, we can obtain the motivation to renew valuable internal resources. With organizational change and innovation capability, we can eliminate the obstacles of resource integration. With organizational flexibility, we can reduce the contradiction in resource reconfiguration. With the building of strategic barriers, we can establish barriers to protect valuable resources (Proposition 4). In addition, arthritis hospitals need to adhere to the prioritized development of arthritis specialty and adjust hospital strategies based on dynamic capabilities to integrate valuable resources and build new core competitiveness (Proposition 5). Finally, the hospital can gain a competitive advantage and improve its performance based on the new core competitiveness.

4.5 The 14th Five-Year Plan of Shanghai Guanghua Hospital of Integrated Traditional Chinese and Western Medicine based on dynamic capabilities

4.5.1 Overview of Shanghai Guanghua Hospital of Integrated Traditional Chinese and Western Medicine

Shanghai Guanghua Hospital of Integrated Traditional Chinese and Western Medicine is a grade A specialized tertiary hospital featuring the integrative diagnosis and treatment of arthritis. Founded in 1958, the hospital established the Research Institute of Arthritis by Integrative Medicine of Shanghai Institute of Traditional Chinese Medicine in July 2013. It became an affiliated hospital of the Shanghai University of Traditional Chinese Medicine in March 2017.

It officially changed its name to Shanghai Guanghua Hospital of Integrated Traditional Chinese and Western Medicine (Shanghai Guanghua Hospital) in April 2017.

The hospital has two campuses on Xinhua Road and West Yan'an Road in the western part of Shanghai, with quiet surroundings and convenient transportation. At present, it has 408 beds, with arthritis specialties such as the First Department of Arthrology, Second Department of Arthrology, Department of Articular Surgery, Department of Orthopedic Surgery, Department of Spine Surgery, Department of Rheumatology, Department of Gout, Department of Spine Rehabilitation and Department of Joint Rehabilitation. There are 329 beds for arthritis, accounting for 82.3% of the total approved beds in the hospital. There are 542 employees, including 56 chief and deputy chief physicians, 140 masters and doctors, 33 masters and doctoral supervisors, four part-time professors, and two experts, receiving a special allowance from the State Council. The hospital is well-equipped with advanced testing instruments such as whole-body MRI, limb joint imager, 64-row CT, flow cytometer, and dual-energy X-ray osteoporosis detection system, which strongly promotes its business development and enhances its core competitiveness.

The hospital is famous for the integrative treatment of rheumatoid arthritis and other kinds of joint diseases. Regarding articular surgery, the hospital has performed artificial joint replacement and minimally invasive arthroscopic surgery for the hip, knee, elbow, ankle, and shoulder. The volume of hip and knee artificial joint replacement is ranked top in Shanghai, and the volume of elbow and ankle joint replacement is ranked top in China, occupying a leading position in articular surgery across China. In internal medicine treatment of joint disease, Guanghua Hospital specializes in diagnosing and treating rheumatoid arthritis, ankylosing spondylitis, osteoarthritis, gouty arthritis, systemic lupus erythematosus, mixed connective tissue disease, and polymyositis. The hospital has performed unique treatments in traditional Chinese medicine for joint diseases, such as medicinal baths and homemade Chinese medicine external applications. It has homemade preparations such as snake preparation, Wenjing Mixture, and Shujin Mixture. The hospital has innovated the method of integrative medicine for arthritis and put forward the new concept of integrative treatment of arthritis.

The hospital won the title of national civilization unit. It ranked second in the group of integrative medicine hospitals in the national performance evaluation of TCM hospitals, with a comprehensive evaluation of A+. It has won the Changning District Governor's Quality Organizational Award and Individual Award. After years of efforts, Guanghua Hospital has become the third batch of critical integrative medicine hospitals of the National Administration of Traditional Chinese Medicine, the national drug clinical trial base, the Research Institute of

Arthritis by Integrative Medicine of Shanghai Institute of Traditional Chinese Medicine, the clinical research base of rheumatoid arthritis of Shanghai Institute of Immunology, the standardized training base of TCM residents in Shanghai, the collaborative base of standardized training of TCM specialists in Shanghai, the practice base of Shanghai University of Traditional Chinese Medicine, Shanghai traditional medicine demonstration center construction unit, Shanghai "preventive treatment of disease" preventive health care standard construction unit, Shanghai nursing standard construction unit, and Hong Kong Baptist University College of Traditional Chinese Medicine bone and joint transformation hospital research institute clinical base. Its specialty and specialized disease projects include the Regional Chinese Medicine (Rheumatology) Treatment Center of the National Administration of Traditional Chinese Medicine, a fundamental specialty of rheumatology in the 12th Five-Year Plan of the National Administration of Traditional Chinese Medicine, a critical clinical specialty of integrative medicine of osteoarthritis in the 13th Five-Year Plan of Shanghai, clinical treatment base for integrative medicine of arthritis in Shanghai, and advantageous clinical specialties (orthopedics and rehabilitation) in Chinese medicine in Shanghai. It has gradually formed a brand of arthritis specialty with concentrated professional staff and strong technical force and enjoys a high reputation at home and abroad.

The hospital adheres to the tenet of "inheritance, innovation, harmony, and development" and emphasizes the philosophy of "a patient-oriented, scientific development, staff-oriented, and harmonious hospital." It carries the mission of we can provide first-class medical technology and quality services for arthritis patients, and our services will benefit the arthritis patients, hospital staff, and the whole society." Furthermore, we strive to build a first-class, world-renowned integrative Chinese and Western medicine hospital with arthritis treatment as the characteristic. "

4.5.2 SWOT i analysis of Shanghai Guanghua Hospital of Integrated Traditional Chinese and Western Medicine

(1) Strengths

We have set up distinct hospital development goals and positioning. The goal of building a national first-class and world-renowned integrative Chinese and western medicine joint disease specialized hospital has become the consensus of the entire hospital staff. The Guanghua Hospital has been accredited by the National Administration of Traditional Chinese Medicine as a grade A tertiary integrative Chinese and western medicine specialized hospital. It is among the third batch of national critical integrative Chinese and western medicine hospitals and a

member of the national, regional Chinese medicine treatment center (rheumatism). In February 2017, it became the eighth hospital affiliated with the Shanghai University of Traditional Chinese Medicine. In January 2021, it successfully passed the grade A tertiary integrative Chinese and Western medicine specialized hospital re-evaluation with a high score. In May 2022, the hospital was awarded the National Key Hospital of Traditional Chinese Medicine with Chinese Medicine Characteristics.

Significant brand and technical advantages. After 60 years of construction and development, Guanghua Hospital has become an integrative Chinese and western medicine hospital with unique characteristics in treating rheumatoid and other joint diseases. Following the discipline construction pattern of rheumatology and orthopedics as the leading specialty, integrative Chinese and Western medicine as the characteristics,the hospital has formed a distinctive brand of integrative Chinese and Western medicine and has a specific brand influence. The hospital has won widespread recognition as patients and peers believe that "Guanghua Hospital specializes in arthritis, and if you have arthritis, you go to Guanghua." The medical, teaching and research construction platforms granted by the government include the Regional Chinese Medicine (Rheumatology) Treatment Center of the National TCM Administration, the Key Specialty of Rheumatology of the 12th Five-Year Plan of the National TCM Administration, the Clinical Key Specialty of Osteoarthritis of the 13th Five-Year Plan of Shanghai, Shanghai clinical diagnosis and treatment base of joint disease through integrative Chinese and western medicine, Shanghai Chinese medicine clinical advantageous specialty (orthopedic injury, rehabilitation), Shanghai integrative Chinese and western medicine joint disease specialty alliance, Shanghai Chinese medicine advantage diseases (bone erosion, bone impotence, lumbar disc stenosis), Changning District famous department (joint medicine, orthopedic injury, rehabilitation), Changning District artificial knee joint replacement key specialty, shoulder and elbow joint disease specialty, joint disease rehabilitation specialty, osteoporosis advantageous specialty, dry eye disease specialty, gout advantageous specialty, psoriatic arthritis key specialty, ankylosing spondylitis specialty, arthritis individualized precision treatment clinical laboratory, Shanghai standardized training base for residents, Shanghai specialist training synergy base, and Shanghai Changning District postdoctoral research station. During the 13th Five-Year Plan period, the total number of scientific research projects reached 148, including seven national projects, 20 provincial and ministerial projects, and the project funding reached more than 26,574,200 yuan. Three hundred forty-two papers were published, including 56 papers in SCI-indexed journals.

(2) Weaknesses

Limitations of the hospital site. However, the medical buildings and facilities in West Yan'an Road and Xinhua Road campuses have been renovated during the 13th Five-Year Plan, especially the use of the main building and medical technology building in the West Yan'an Road campus (former Zhongshan Hospital branch). Although certain new business rooms were opened up, the long history and unreasonable layout of the Zhongshan Hospital branch building have obvious medical safety hazards. Following the requirements of building a regional center for integrative Chinese and Western medicine treatment and establishing a standardized clinical treatment platform for arthritis in the Yangtze River Delta region, the unreasonable layout of the hospital has become an essential factor limiting its business development. The shortage and aging of diagnostic, treatment, and environmental facilities have seriously affected patients' medical experience. The limitations of the hospital hardware conditions make it challenging to meet the requirements of a modern specialized hospital. The hospital is currently located in two hospital areas. It cannot meet the requirements of a standardized process of nosocomial infection, epidemic prevention and control, emergency care, and operating room through internal renovation. It is urgent to accelerate the relocation project to a new hospital with 600 beds.

A severe shortage of government-authorized staffing. According to the staffing standards of medical institutions, the requirements of the construction of a grade A specialized tertiary hospital, and the scale of 600 beds in the future, there should be 1,000 government-authorized staffing quotas. However, now Guanghua Hospital has only 350, which is far from enough to meet the needs of the hospital's specialty development and talent introduction.

(3) Opportunities

A. The policy environment is favorable for Guanghua Hospital to adjust its strategy and accelerate its development.

Following the strategic guidelines of Healthy China and Healthy Shanghai, the current medical reform and TCM policy mechanisms have been continuously improved, financial investment has been continuously increased, and a series of policies to support and promote the development of TCM have been issued by the municipal party committee and municipal government as well as all relevant departments. The relevant documents include the *Traditional Chinese Medicine Law of the People's Republic of China, the Opinions of the CPC Central Committee and the State Council on Promoting the Inheritance and Innovative Development of Chinese Medicine, the Notice of the State Council on Issuing the Outline of the Strategic Plan for the Development of Chinese Medicine (2016-2030), the Implementation Opinions of the*

CPC Shanghai Municipal Committee and Shanghai Municipal People's Government on Promoting the Inheritance and Innovative Development of Chinese Medicine, the Implementation Opinions of the CPC Shanghai Municipal Committee and Shanghai Municipal People's Government on Implementing the Opinions of the CPC Central Committee and the State Council on Deepening the Reform of the Medical and Health System, and Notice of the Shanghai Municipal People's Government on Issuing the Recent Key Implementation Plan for Deepening the Reform of the Medical and Health System in Shanghai.

In terms of medical insurance, the medical insurance payment has changed from the original global budget to DIP and DRGs payment schedules. The insurance policy changes reflect the medical insurance supervision reform and directly promote the hospital to reduce medical costs. The incentive mechanism has changed from revenue maximization to cost minimization. DIP payment facilitates the development and application of new technologies in hospitals. In addition, in adjusting the charging items and prices, the medical insurance standards for Chinese medicine specialty items such as orthopedic injury, acupuncture and moxibustion, and massage are moderately increased.

B. The policy environment is favorable for Guanghua Hospital to adjust its strategy and accelerate its development.

China's economy has transformed from the original high-speed development to high-quality development, and although the global economy has slowed down due to the impact of COVID-19, the Implementation Opinions of the CPC Shanghai Municipal Committee and Shanghai Municipal People's Government on Promoting the Inheritance and Innovative Development of Chinese Medicine as well as the Shanghai Regulations on Chinese Medicine further clarify the government's responsibility for health investment, and put forward the strengthening of multiple investments based on the traditional Chinese medicine development system and mechanism. Special funds for TCM from Municipal Health Commission and TCM Administration have increased by 30% annually. The regular funds for TCM institutions at municipal and district levels have also increased steadily. From 2010 to 2012, 2014 to 2016, and 2018 to 2020, the municipal government implemented three consecutive rounds of TCM three-year action plan projects to support the rapid development of TCM. The funding for the third round of TCM's three-year action plan (2018-2020) increased again, which laid a solid foundation for the development of the medical industry.

The Yangtze River Delta region, which includes Shanghai and 15 cities above the prefecture level of Jiangsu and Zhejiang, is the most densely populated, economically developed, and affluent economic region in China. It becomes part of the integration of the Yangtze River Delta

and actively takes part in the profound transformation strategy of Changning District. Changning District creates an innovation-driven, fashionable, vibrant, green, and livable international downtown area that provides solid economic support for developing the healthcare industry. In the 14th Five-Year Plan of Health of the Changning District, Guanghua Hospital is supposed to be built as a regional center for integrative Chinese and Western medicine treatment.

C. The social environment of the medical industry is favorable for Guanghua Hospital to adjust its strategy and accelerate its development.

With the rapid increase of Shanghai's permanent resident population and the aging population, people's demands for high-quality health services have grown significantly. The aging of the population, changes in the disease spectrum, high incidence of chronic diseases such as cancer, cardiovascular and cerebrovascular diseases, and factors such as disability and dementia will continue to force the adjustment of health services and policies for the elderly. The allocation of medical service resources is uneven in Shanghai, with a relative shortage of high-quality medical resources. The limited medical resources can hardly meet the growing medical needs and patients' psychological expectations, resulting in significant patient dissatisfaction with medical services. The primary issue facing public hospitals today is how to improve the management level and follow the direction of high-quality development.

D. The technical environment of the medical industry is favorable for Guanghua Hospital to adjust its strategy and accelerate its development.

China is paying increasing attention to the diagnosis and treatment of autoimmune diseases. On October 31, 2019, the National Health Commission issued the Guidelines for the Construction and Management of Rheumatology and Immunology Departments in General Hospitals (for Trial Implementation) (in the future, referred to as the Guidelines). The Guidelines state that general tertiary hospitals with the conditions should, in principle, establish independent rheumatology and immunology departments. In contrast, secondary general hospitals and other medical institutions with these conditions are encouraged to establish independent rheumatology and immunology departments. Hospitals should have independent medical laboratories to support the routine examination of rheumatology and immunology diseases. With the development of clinical medicine and the deepening understanding of the immune system, the diagnosis rate of autoimmune diseases is increasing with the advancement of various testing methods and the improvement of diagnosis levels. The increasing incidence of autoimmune diseases is also due to changes in people's living environment and lifestyle habits. According to the China Autoimmune Disease Market Outlook and Investment Opportunity Research Report released by China Business Industry Research Institute, the

autoimmune disease diagnosis market has been developing rapidly in recent years, with the size of China's auto-antibody testing market being 1.157 billion yuan in 2017 and 1.504 billion yuan in 2020. This figure is expected to rise further to 1.741 billion yuan in 2021.

Artificial intelligence, big data, and other information technology will profoundly change how health services are provided. They will increase the intelligence of medical services and promote the development of new technologies and business models in the healthcare industry.

In summary, there are four opportunities for the development of Guanghua Hospital:

a) The relocation of the hospital has been included in the 13th Five-Year Plan and 14th Five-Year Plan of Shanghai and the development plan of Shanghai Traditional Chinese Medicine. The district government, Shanghai University of Traditional Chinese Medicine, and even the Shanghai Health Commission attach great importance to the relocation of Guanghua Hospital, ushering in a new round of development opportunities for the hospital.
b) Several supporting policies for TCM development have been formulated.
c) The implementation of Shanghai's Opinions on Improving the System and Mechanism for Prevention and Control of Major Epidemics and Establishing a Sound Public Health Emergency Management System and the construction of the Changning Regional Center for Integrative Chinese and Western Medicine provides a boost to the enhancement of the comprehensive medical security capabilities of Guanghua Hospital.
d) With the economic and social development and the aging of Shanghai's population, people's health awareness has increased, and their demands for health services, including traditional Chinese medicine, are also growing.

(4) Threats

The first threat comes from competition in the same industry. Increasing numbers of hospitals have set apart specialized rheumatology departments or focus groups on artificial joints, arthroscopy, and spine surgery. Since the tertiary general municipal hospitals have the advantage of talent reserve and market appeal, they are developing rapidly. In addition, the establishment of rheumatology departments in hospitals in foreign provinces and cities also impacts the traditional advantage of Guanghua Hospital in osteoarthrosis. It requires a dislocation competition strategy to address the challenges by establishing its characteristics and reputation.

The second threat comes from the reform of medical insurance policies. The DIP and DRGs payment reform propose new hospital requirements to improve delicacy management and operational efficiency.

Third, with the deepening of public hospital reform, the promotion of the basic medical security system, the establishment of the national essential drug system, the comprehensive implementation of the centralized procurement of drugs and medical equipment, as well as continuous increase of human costs, the pressure on hospital operation will gradually increase.

Fourth, the scale of Guanghua Hospital is gradually expanding, but it is challenging to realize intensive management due to the limitation of two hospital campuses. In addition, we need to further expand our business to segment more sub-specialties. There is a gap between our technical strength in the rheumatology specialty and our sister hospitals.

(5) Value and impact on society

To promote the change in development concept, it is crucial for the hospital to follow the development outlook of the new era, respond to the changes in health needs, and actively expand social responsibility. First, hospitals should focus on developing the values, culture, and spirit of the medical staff to improve reputation and brand awareness, strengthen patient loyalty and provide a better medical experience. The hospital should strengthen the education and training of the staff on their philosophy and core values, improve doctor-patient communication skills and service techniques, and strive to provide warm, convenient, comfortable, and appropriately priced medical services for arthritis patients.

Second, against the background of the aging population aging and increasing public demands for healthcare, the hospital should make efforts in the field of geriatric degenerative joint diseases. In the construction of the new hospital campus, there should be more elderly-friendly design in space and facilities, such as adding handrails, setting elevators and wheelchair-accessible passages, and indoor non-slip floors. In terms of service, there should be courtesy medical channels for the elderly and a volunteer team to help elderlies.

Third, the discipline development should focus on the intersection of geriatrics and osteoarthropathy, such as geriatrics, rheumatology, orthopedics (orthopedic surgery), and critical care medicine to respond to the health needs of the aging population.

The SWOT i analysis matrix of Shanghai Guanghua Hospital of Integrated Traditional Chinese and Western Medicine is shown in Table 4.2.

Table 4.2 SWOT i Analysis Matrix of Shanghai Guanghua Hospital of Integrated Traditional Chinese and Western Medicine

	Strengths	*Weaknesses*
Opportunities	**SO strategy**	**WO strategy**
	1. Identify the clear positioning of arthritis specialty, give full play to the characteristic advantages of Chinese medicine, and build a national first-class integrative medicine hospital. 2. Maintain the advantages in arthritis treatment technology and brand, continue to introduce and train talents, and form a differentiated competitive advantage.	1. Accelerate the relocation of the hospital to improve the hardware and facilities the hospital. 2. Strengthen the comprehensive medical support capacity of the hospital to become a regional medical center of Chinese and Western medicine in Changning District. 3. Seek government support to increase the number of publicly-authorized hospital staffing and expand the hospital scale.
Threats	**ST strategy**	**WT strategy**
	1. Make the best of the strength of the arthritis team, form the leading competitive edge in integrative medicine technology, and quickly carry out scientific research on arthritis. 2. Increase the development of acupuncture, massage, TCM rehabilitation, and preventive treatment of diseases in accordance with the national and Shanghai's TCM policies. 3. Build 5G intelligent medical service system and strengthen the construction of Internet-based hospital.	1. Make full use of existing sites, accelerate the setting of sub-specialties, improve the specialty management system, strengthen training, and improve the level of hospital specialties. 2. Deepen the research on DRG, DIP and other medical insurance policies, keenly perceive the specific measures of the medical reforms, adjust the hospital policies at the right time, and build a high-quality specialized hospital. 3. Increase the investment and reward for science and technology, encourage clinical transformation, and form a favorable research atmosphere.
Values & Impact on Society	1. Strengthen education and training on the philosophy and core values of the staff, improve doctor-patient communication skills and service skills, and strive to provide appropriate medical services for arthritis patients. 2. Add elderly-friendly design in space and facilities in the construction of the new hospital campus, design wheelchair accessible passages, and increase the volunteer team to help the elderly. 3. Focus the discipline development on the intersection of geriatrics and osteoarthrosis to respond to the health needs of the aging population.	

4.5.3 Strategic adjustment

In this study, a model of the development strategy of arthritis hospitals based on dynamic capabilities is formulated through expert interviews; then, through the SWOT i analysis, the researcher carries out an in-depth analysis of the development of Guanghua Hospital and formulates corresponding development strategies. Based on the research model, expert suggestions, and the hospital's current development strategy, we invite seven hospital middle managers to conduct focus group interviews to analyze the hospital's core competence and dynamic capabilities based on the actual situation of the hospital and the departments. In

addition, for the five dimensions and specific items of dynamic capabilities, the seven interviewed middle managers have proposed their measures of hospital development according to the hospital development strategy.

4.5.3.1 Core competence analysis

(1) Medical quality

Experts in Guanghua Hospital believe that the core competence of Guanghua Hospital lies in the guarantee of medical quality. The primary task of the hospital is to keep abreast of international development in the diagnosis and treatment technology of arthritis and form a standardized treatment plan for arthritis, which can significantly improve the quality of medical treatment.

"From the perspective of certain diseases, our core competence first lies in the advanced technology of diagnosis and treatment. As far as arthritis is concerned, we are equipped with all the advanced medical instruments and equipment involving laboratory diagnosis, molecular diagnosis, and pathological diagnosis. Such diagnostic technology is cutting-edge, even at the international level. This is where our core competence lies. The standardized diagnosis and treatment of arthritis are also one of our advantages." (Expert GH2)

"Currently, medical technology is relatively accessible to all hospitals. In this case, it is worth thinking about how to find innovations and driving forces. We may find breakthroughs through the development of some treatment norms. If we formulate the treatment plans used by other hospitals, it will reflect our academic influence." "The medical ability, or the ability to treat critical, emergency, serious illnesses, and difficult cases is the most important factor that attracts patients or ultimately determines the height of development." (Expert GH7)

(2) Preponderant disciplines

The development of preponderant disciplines can be centered on "special diseases" and "specialties." In Arthrology, we can form advantageous diseases of rheumatoid arthritis, ankylosing spondylitis, and psoriatic arthritis to establish excellent and preponderant disciplines. Second, we can integrate Arthrology and Joint Surgery through the synergy between different disciplines. The standardized processes in enhanced recovery after surgery, post-operative rehabilitation, and challenging and critical case treatment will also be the strengths of Guanghua Hospital.

"*From the perspective of certain diseases, we have segmented them by the sub-specialties, including rheumatoid arthritis, ankylosing spondylitis, and psoriatic arthritis. There are also sub-specialties in Joint Surgery subdivided by joint sites. Within the departments, we can also*

subdivide the diseases based on the main consultation group responsibility system, which is our strength and core competence." "*We have integration of Arthrology and Joint Surgery; we have integration of traditional Chinese and Western medicine; we have post-operative rehabilitation, we have post-operative coverage for difficult and critical illnesses. Our departments are very closely connected. For example, when a patient in the Arthrology Department needs surgery, there only needs to be a phone call or a consultation order, and the staff of the relevant departments will respond very quickly, which is also one of our strengths.*" *(Expert GH2)*

(3) Talent echelon

Experts in Guanghua Hospital believe that, on the one hand, the breadth of talents should be increased in the construction of the talent echelon to deal with complicated and severe cases, and a team is needed for technical support for the consultation of complex cases. In addition, the lack of talent echelon and related facilities in emergency and trauma surgery in Guanghua Hospital is also one of the reasons for its limited business volume.

"The breadth of our talent may not be enough. Take the ICU, for example; probably only their ability to diagnose and treat common coronary heart diseases or their comprehensive treatment ability has been improved. I believe it is far from enough for the long-term development of the hospital. We must be able to deal with difficult and serious illnesses, and it is important to have related talents and teams." "I think it is possible to scale up our emergency and trauma surgery to attract this part of patients to Guanghua Hospital. Suppose we can enhance our ability in emergency treatment. In that case, we will have a better reputation and word-of-mouth among the patients because they know that Guanghua Hospital can handle emergency patients well and treat patients with complicated illnesses. In this case, Guanghua Hospital will be more influential and competitive." (Expert GH5)

On the other hand, we need to have a full-cycle capability of talent training in arthritis. Guanghua Hospital is facing the imminent retirement of many veteran directors, and we still need to improve in the talent echelon.

"There is still room for improvement in our ability to train young talents to form a reasonable talent echelon. There is a critical problem: in the following one or two years, many department directors will retire. Will our advantageous specialties maintain the competitive edge after the retirement of these directors? If someone is going to retire or cannot go to work due to particular circumstances, are the young colleagues capable of taking over the job soon?" (Expert GH7)

(4) Scientific research innovation

Experts in Guanghua Hospital believe that with the development of the hospital's scientific

research and innovation, its reputation among its peers is rising daily. The gradual formation of new treatment plans and transformation of research results have improved the quality of medical treatment and effectively shaped the hospital brand. Guanghua Hospital has not formed a large-scale scientific research platform yet. From the development perspective, clinically oriented scientific research should be utilized more effectively to be transformed into research results.

"Our research has become more in-depth. We have the largest number of patients, we have the most specimens of arthritis, the treatment volume over the last years has been increasing year by year, and the quality of our academic articles has been significantly increasing." (Expert GH2)

"The growth in research projects and academic articles in our hospital in recent years is swift, and the quantity is also increasing yearly. Our innovation ability seems very good, but it is questionable how many of these innovations are meaningful and valuable. When we propose a research idea, it should be based on clinical problems, and the conclusions should be ultimately applied to the clinical treatment. The new research idea must be applied and popularized in the clinical treatment, ultimately promoting our clinical diagnosis and treatment level." (Expert GH4)

(5) Operational efficiency

The directors of functional departments of hospital operation management should be included in this interview. Specific measures for operational efficiency are not mentioned, so operational efficiency is not further discussed.

(6) Hospital brand

Experts in Guanghua Hospital believe that the publicity work of Guanghua Hospital is still insufficient, and the construction of the hospital brand should focus on the perspective of "patient-centered." The promotion of the hospital brand should be visible to the target patients. Guanghua Hospital should expand its promotion channels and advertise its brand in places where patients need it most.

"We have met some very embarrassing situations. For example, last time in the ward round, our leader asked about the patient's feelings about treatment in Guanghua Hospital; the patient answered that the hospital is excellent, but none of us heard of it before, I have been to Longhua Hospital and Yueyang Hospital, but I knew nothing about such a good service in your hospital before." (Expert GH3)

(7) Hospital Culture

Experts in Guanghua Hospital believe that building hospital culture is a long-term process,

and a culture of innovation is an essential internal driving force for the hospital's sustained competitive advantage. The core of hospital culture building also lies in outstanding talents. The hospital culture should be built by introducing an internal competition mechanism through introducing external talents and cultivating internal reserve talents.

"Hospital culture cannot be formed overnight. If the hospital has a group of outstanding talents, naturally a relatively good hospital culture will be shaped." (Expert GH6)

"We may find solutions from the perspectives of humanistic care or some career development. We must have strong supporting measures to retain the talents and retain them for a long period." (Expert GH7)

"If we are unable to introduce external talents, we have to focus on the newly-recruited young people in the hospital. If they have good potential, we should still endeavor to train them." (Expert GH5)

4.5.3.2 Measures to enhance dynamic capabilities

(1) Environment perception capability

Experts in Guanghua Hospital believe that the most critical perception of the environment is tracking medical technology upgrades. The new medical technology is reflected in emerging drugs, medical devices, diagnostic equipment, and treatment guidelines. The second is the perception of the policy orientation of the reforms of medical treatment, medical insurance, and pharmaceuticals. Given China's current government-led medical system, public hospitals assume the core tasks of medical treatment and service, and medical reform policies greatly influence their development direction. The perception and identification of the above two environmental factors are the most needed capabilities for the long-term development of Guanghua Hospital.

"There are many policies in China. A hospital is greatly influenced by what the policy guides or the state encourages, which is one of the biggest external environments." "It has been stipulated that all general tertiary hospitals can open set up rheumatology specialties, which is, in fact, a big impact on our traditional arthritis departments, and this is also the relevant notice issued by the Ministry of Health." "I think the model of the First Affiliated Hospital of Xinjiang Medical University can serve as a reference because they are grasping the new technology in the medical industry by introducing the robot, so we must attach great importance to the new technology." (Expert GH1)

(2) Organizational learning ability

Experts in Guanghua Hospital believe that organizational learning is the most efficient way

to form a talent echelon. First of all, the hospital has established relevant measures and systems for medical business learning and academic exchanges. However, they need to be better implemented, and the medical staff is not enthusiastic about participating in the learning. Second, we can continue to expand the mode of further learning from the specialized disease model to an interdisciplinary one so that the learning is not limited to arthritis. Moreover, more knowledge and skills of other specialties can be learned to make up for the lack of diagnosis and treatment of the specialized diseases. Furthermore, the incentive mechanism for research and innovation needs to be optimized to make the hospital policy more targeted.

"What do we learn in the further learning? For example, suppose my major is interstitial pneumonia rather than rheumatology specialties. In that case, we can choose to go to the pulmonary hospital or hospitals specializing in interstitial pneumonia for further study. For another example, Director Yue's major is psoriatic arthritis; he can send people to dermatology hospitals for further study. This is how we can make our specialty more professional." (Expert GH2)

"If you want to retain the talents, then you have to formulate an incentive initiative. In other words, the performance policy is positively related to the development of the hospital." (Expert GH6)

"Now we do have rewards and punishments, but the rewards are far from enough to play a motivating role. The rewards are not a bit attractive to them, at least it seems so to me." (Expert GH7)

(3) Organizational change and innovation capability

Experts in Guanghua Hospital believe that the most crucial point of organizational change and innovation capability is the subdivision and integration of orthopedic sub-specialties. In order to maximize efficiency and further improve hospital performance, we need to specialize in developing sub-specialties and mobilize valuable resources and talents. At the same time, the hospital needs to carry out integrated development in due course, expand the relevant integrated departments based on the specialized disease treatment model, and take the construction of the new hospital campus as an opportunity to expand the hospital scale.

"If it is psoriasis, we recommend the patient to Director Yue. If it is pain in the knees or hip and an inability to walk, then we recommend the patient to President Xiao. If it is a hand joint deformity, we recommend the patient to the arthrology group. If it is gout, we recommend the patient to Director Yang. By triage in this way, we can achieve standardized training of professional medical skills." (Expert GH2)

"Patients know that Guanghua Hospital has two rehabilitation departments, one joint

rehabilitation department, and one spine rehabilitation department. They are different only in names, and their admissions of patients are overlapped. However, there are differences between these two departments. For example, Director Guo's treatment is based on needle warming moxibustion, and my treatment is based on minimally invasive treatment, small needle-knife therapy, and acupunoscopic surgery. After we integrate the two departments, there has been a gratifying change. Originally, my patients and Secretary Liang's patients were on the same floor. After the integration, with the exchange between patients, the patient experience has been improved. We are slowly expanding our integration, and in the end, all patients in our hospital can receive a homogeneous treatment." "What is the resistance to our implementation now? When it is time to subdivide the specialties, we must subdivide the specialties and use professional people to do professional things. However, we must also integrate when it is time to integrate." (Expert GH5)

"I feel that the reason for our bottleneck is true to some other time-honored tertiary hospitals. Director Wang, You have been working in Shanghai Ninth People's Hospital for many years, but his outpatient visits stop to rise after reaching a certain amount. However, after he took part in the team at Renji Hospital, the surgery immediately multiplied, and this is its platform-scale effect. It is because Renji Hospital has a more extensive presence than us. It has several branches, hundreds of years of history, and so many departments, so relatively speaking, it has more patient flow than us. It does not have to do anything to promote itself, and many patients still come to it to seek medical treatment." (Expert GH7)

(4) Organizational flexibility

Experts in Guanghua Hospital believe that it currently needs to dynamically optimize its hospital structure and system according to its development stage, break the inherent hierarchy, introduce a new culture, increase internal competition and vitality, and increase flexibility in management to encourage a culture of trial and error. The hospital staff should be streamlined, and information technology needs to be applied to increase efficiency.

"Most employees have been working here for many years, and the hospital's culture has been rigid. However, the hospital is at a development stage. If we want to go further, we must break this inherent hierarchy to introduce a new culture. Only in this way can there be new vitality and collision, and with collision, innovation and change will occur. Sometimes I think the advantage of hybridization is also quite important." (Expert GH6)

"Guanghua Hospital is relatively streamlined in its staff. To improve efficiency, it is necessary to have high-quality talents and efficient work, in which case the hospital may need a higher degree of application of information technology. At present, perhaps this is also a

bottleneck that restricts the development of Guanghua Hospital. A high degree of informatization can save the workforce because the human resources are already in short supply." (Expert GH4)

(5) Building of strategic barriers

Experts in Guanghua Hospital believe that the building of strategic barriers is one of the keys for Guanghua Hospital to form competitive advantages. The continuous upgrade of medical technology is the most critical factor for the hospital to build strategic barriers. The surgical team of Guanghua Hospital has accumulated experience in technology related to complex deformities and complicated surgeries, which is difficult to be replicated by other hospitals and is also our competitive advantage.

"We have been very competitive in joint surgery because many hospitals could not perform artificial joint replacements before, but we can. However, artificial joint replacement technology is now a very popularized surgery, and even secondary hospitals can do this, but why do we still have many patients from other provinces or even other countries? Because the original patients with high deformity, compound deformity, or whole-body multi-joint deformity who have received surgery in our hospital keep on promoting our hospital to others." (Expert GH7)

The establishment of the hospital brand can be carried out in several ways.

a) Reputation can be promoted through the characteristic preparations of good discipline and complicated surgeries in joint surgery.
b) Enhancing medical services, establishing a one-stop patient service center, optimizing the service process, and providing specialized training for medical service personnel can help improve the hospital brand.
c) We can actively expand publicity in the new media to improve the related medical business while establishing the brand of Guanghua Hospital.

"In the Arthrology Department, if we want to compete with others, we must strengthen the brand advantage. We need to form the brand of Guanghua Hospital, and we need good discipline or products. For example, the snake preparations in our hospital are relatively popular, so we hope to launch a rheumatism preparation unique to Guanghua Hospital in the next few years. I do think this is a direction for future development." (Expert GH1)

"We should establish a one-stop patient service center. For example, after the patients come in, we assign the corresponding specialists to them according to their request and guide them to receive appropriate examination or treatment. The relevant staff of the patient service center should also provide further guidance to patients on medication. In the service center, the staff

should speak in an amiable attitude, use standardized language, and unified dress, which is also a way for us to enhance the hospital's brand image." "We need to listen to our patients. The new media era is developing rapidly, and we should use new media and private traffic well. The WeChat official account of our hospital should be fully utilized to regularly push articles that have been released by the media or those that are persuasive. In addition, in the official account, we can manage patient word-of-mouth by pushing excellent deeds within the hospital. The patient's letter of thanks or banner in the media, then the old patients will introduce new patients to our hospital by word-of-mouth, which will improve the brand loyalty of our 500,000-600,000 patients." (Expert GH2)

"Guanghua Hospital also has an excellent traffic convenience advantage. We are at the junction of West Yan'an Road, and the No.71 Bus is also very convenient. Surrounding residents may not know Guanghua Hospital, so it is necessary to strengthen publicity. For patients in the far suburbs of Shanghai, we can also strengthen the publicity to attract the patients." (Expert GH6)

"We should pay special attention to the highly deformed patients because they often have an advertising effect. When these patients come to us, they trust us because the treatment of arthritis is our strength, so we should maintain and improve our strength and make publicity when necessary. For example, one of our joint surgery directors has performed surgeries for many highly deformed patients, and each of these patients is a living advertisement. People will compare his patients before and after surgery, and when they see the significant medical outcome, they will be attracted to Guanghua Hospital for treatment." (Expert GH7)

4.5.4 Summary of strategic adjustment

Guanghua Hospital has conducted a detailed analysis of its core competence through the focus group interview. The hospital now has an excellent discipline of arthritis. Moreover, it has been recognized by the government and patients in terms of medical quality. The hospital has formed a talent echelon, but it still needs more breadth and depth, and there is a generation gap in the echelon. The hospital's scientific research and innovation have developed significantly in the past five years and have achieved a relatively high academic status in the industry. However, there is still a gap compared to the benchmark hospitals. The hospital's brand promotion needs to be improved, and more advertisement is needed to attract more patients directly. The hospital's internal teaching ability has dramatically improved in recent years. However, an excellent innovation culture has yet to be formed in the hospital, and specific incentive policies are needed to guide the formation of the desired culture.

Through analyzing the competitive situation of the hospital, leaders in Guanghua Hospital come to realize that in this new development strategy, the hospital needs to improve the environmental perception capability further, mainly in tracking the upgrades of new medical technology, especially the introduction of emerging drugs, medical devices, and diagnostic equipment, and participation or leadership in the development of treatment guidelines. There should be a policy research department within the hospital to keep abreast of medical reform trends and understand the development of competitors in order to develop response strategies. The improvement of organizational learning capability lies in strengthening the medical business learning system oriented by "specialized diseases" formulating related incentive policies for research and innovation, and promoting academic exchanges outside the hospital to consolidate its current academic status in the industry. The hospital should segment the orthopedic sub-specialties and specialize in treating "specialized diseases" by a group of primary care physicians. The construction of the new hospital campus should be an opportunity to expand the scale of its integrated support departments. In terms of organizational flexibility, the hospital needs to dynamically optimize the hospital structure and system according to the development stages, break down the inherent hierarchy, introduce a new culture, increase internal competition and vitality, and add flexibility in management to encourage a culture of trial and error. The streamlining of hospital staff requires introducing information technology to increase efficiency. The strategic barriers are built through the above capabilities. Continuous medical technology upgrades allow the hospital to accumulate treatment experience, surgical techniques, and capability for critical, emergency, brutal, severe, and complex illnesses. The hospital should optimize hospital brand promotion channels, establish a one-stop patient service center, strengthen the development of medical service, and exploit the new media to improve the brand and reputation of Guanghua Hospital and increase patient stickiness and brand loyalty. The above measures can help us build the hospital's dynamic capabilities, rebuild its core competence, and form its competitive advantage.

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Chapter 5: Discussion and Suggestions

5.1 Research conclusion

In response to the need to study the development strategy of arthritis-specialized hospitals based on dynamic capabilities, this thesis systematically reviews the relevant fundamental theories and elaborates on the source and development of dynamic capabilities, including enterprise capability theory, resource-based theory, and core competence theory. In addition, this thesis reviews the development history of strategic management theory and relevant literature on competitive advantage. It analyzes the sources of competitive advantage and how to maintain long-term competitive advantage. The thesis also reviews the development of Chinese public hospitals, and the dilemmas in the development of arthritis hospitals are proposed based on a literature review of the development of specialized hospitals and arthritis hospitals.

This study systematically analyzes the current situation and development strategies of the specialties of ten public hospitals in China featuring the treatment of arthritis, discusses the reasons for the formation of the competitive advantages and core competitiveness of the specialties in these hospitals, and explores the key factors affecting the development of the arthritis specialties of these hospitals. By analyzing the connotation and dimensions of dynamic capabilities in arthritis-specialized hospitals and the relevant factors affecting the development of arthritis hospitals, we explain in detail the ways to build dynamic capabilities and the path to gain competitive advantage in arthritis hospitals. In addition, Shanghai Guanghua Hospital was used as an example to analyze the development strategy of arthritis hospitals systematically.

Considering the applicability of the study findings, we select ten hospitals featuring treatment of osteoarthrosis across China, including six general hospitals and four arthritis-specialized hospitals. Since each hospital has its historical background and development path, the economic development of the place where they are located, and their resources and capabilities also vary, these ten hospitals provide a wealth of information for this study. Their inherent difference provides a basis for the generalizability of the research conclusion. In this study, we conducted in-depth interviews with the management of the ten hospitals through a case study approach, used the Grounded Theory approach to carry out a three-level coding of qualitative materials for a bottom-up inductive analysis, and finally constructed a model for the

development strategy of arthritis hospitals in an uncertain environment based on dynamic capabilities. The details are as follows.

(1) Arthritis hospitals should be aware of the dynamic nature of the external environment, recognize the development trend, identify their positioning, and differentiate themselves from the primary and general hospitals. First, we need to analyze the environment based on the macro and industrial structure of the organization. With the help of PEST analysis, SOWT i analysis, and five dimensions of dynamic capabilities, we analyzed the sensitivity of the arthritis hospitals to the external environment, perception of the changes in the disease spectrum of arthritis due to the aging population, the policy changes of the national medical reforms, and the impact of new technologies.

(2) Arthritis-specialized hospitals should continuously develop their core competencies and competitive advantages. We should determine which environmental elements can help the hospitals to seize the opportunities and form a competitive advantage and which environmental elements will cause difficulties for the hospital's development to avoid risks and turn crises into opportunities. We continue to sort out the internal resources and capabilities to determine whether they are susceptible to external influence when adapted to the dynamic environment. Those resources and capabilities that are not easily affected can be used as core competencies in the long-term competitive process. Those easily affected need to be dynamically adjusted in short-term competition through the integration and reconfiguration of dynamic capabilities.

(3) The development strategy of the arthritis-specialized hospitals should be dynamically adjusted to adapt to the uncertainty of the external environment, and the dynamic capabilities of the arthritis hospitals should be built based on the hospital's existing valuable resources, capabilities, and core competitiveness. In this study, the five dimensions of dynamic capabilities of arthritis hospitals are analyzed, including environmental perception capability, organizational learning capability, organizational change and innovation capability, organizational flexibility, and the building of strategic barriers.

Environmental perception capability needs to focus on assessing the adjustment of the medical reform policies in medical treatment, medical insurance, and pharmaceuticals. The macro-environment analysis includes demographic, economic, and technological analysis. In addition, relevant stakeholders should be assessed, mainly patients and drug and medical device supply chain enterprises. Environment perception capability provides the direction for the development strategy of the hospitals. The most critical point of the environmental perception capability is tracking medical insurance policy changes and medical technology upgrades. Hospitals need to respond to the development of the policies, consolidate the essential medical

service items, and at the same time evaluate the revenue composition, control the proportion of revenue from drugs and devices within a reasonable range, and focus on increasing the proportion of revenue from technical services to cope with complex and unpredictable policy changes. The tracking of medical technology upgrades means taking the lead and advantage in the competition in cutting-edge fields.

Organizational learning capability provides the impetus for the development strategy of the hospital. Organizational learning is key to the innovation of the hospital's valuable resources and capabilities. Organizational learning capability is reflected in the hospital's internal medical business learning system, the frequency of academic exchanges at the hospital level, the construction of standardized and specialized training bases for young physicians, and the dispatch of physicians for further training at home and abroad. The most critical point of organizational learning capability is that the hospital should have the ability to train reserve talents in the whole process. The arthritis hospitals should particularly pay attention to the training of diagnostic ability and surgical skills, which requires the hospitals to prioritize the growth of the reserve talents to obtain a sustained competitive advantage.

Organizational change and innovation in hospitals are essential measures to foster hospital culture. The organizational change and innovation capability of arthritis hospitals is reflected in the hospital's segmentation and integration of orthopedic sub-specialties, the incentive system for research innovation, emerging technologies and business development, the ability to build strategic alliances, and the ability to foster a hospital culture of innovation. In organizational change and innovation, the hospital can build a culture of innovation through internal departmental integration, incentive system reform, and external strategic alliances to win in the external competition. The segmentation and integration of orthopedic sub-specialties in arthritis hospitals is the most critical point and the key initiative for the hospital to expand the scale of specialties and improve medical quality. In the segmentation of sub-specialties, it is necessary to fully understand the demands of physicians in each department, resolve conflicts, and gradually establish systems and norms to reduce resistance to development. The organizational change and innovation capability can reduce obstacles to the development strategy of the hospital.

Organizational flexibility emphasizes a people-centered evaluation and assessment system, allowing employees to make trial and error and break the routine. It also delegates the decision-making authority to lower-level staff in mature management to make decisions promptly and efficiently. Organizational flexibility is reflected in the ability to adjust the hospital structure and system promptly, the flattening of the management structure, and the ability to mobilize the

staff's initiative fully. Organizational flexibility is necessary to overcome the hospital's current rigidity of multi-level management. The arthritis hospitals should give full play to the autonomy of the staff to maximize the specialty characteristics. The hospitals also need to provide the platform the physicians need and the necessary institutional guarantee to break the monopoly of skills and technology within the specialty. Organizational flexibility can reduce conflicts in the development strategy of the hospital.

Strategic barriers are built to reduce imitation and learning by competitors. The barriers should not prevent regular academic exchanges. They can be built by promoting intellectual property rights, preventing the loss of critical employees, continuous technological upgrades, improving patient satisfaction, and establishing a hospital brand. Establishing strategic barriers is a gradual and step-by-step process, and the most important thing is the continuous upgrade of arthritis diagnosis and treatment technologies. This is the hospital's medical quality cornerstone and embodies its medical capability. Only by ensuring medical quality and improving medical capability can the hospital obtain patient satisfaction and gradually establish its brand, thus gaining a competitive advantage. The building of strategic barriers protects the development strategy of the hospital.

In summary, the five dimensions of dynamic capabilities are critical capabilities for arthritis hospitals to adapt to drastic changes in the environment, and they are also the key indicators to test the level of competitiveness of arthritis hospitals.

(4) Based on dynamic capabilities, the hospital management can propose the direction of strategic adjustment and specific measures. However, the critical strategy for arthritis hospitals to achieve a competitive advantage is to adhere to the prioritized development of arthritis-related specialties and make concerted efforts to develop comprehensive departments to bring into play integrated support capability.

5.2 Research innovations

(1) Theoretical innovation

In this study, we conducted interviews with administrators of ten hospitals and used NVivo 12 Plus for inductive analysis. We explored the connotation of dynamic capabilities of arthritis hospitals, and comprehensively analyzed the relationship between dynamic capabilities, development strategies and competitive advantages of arthritis hospitals based on the strategic management theory. A model of development strategy of arthritis hospitals in the uncertain environment is constructed, which is corroborated with literature research. It has been proposed

that the connotation of the dynamic capabilities of arthritis hospitals refers to environment perception capability, organizational learning capability, organizational change and innovation capability, organizational flexibility and building of strategic barriers. The improvement of dynamic capabilities of the arthritis hospitals is to make their own resources and capabilities adaptable to the environment and capable of rapid transformation, while the source of competitive advantage of the hospitals is the external manifestation of their dynamic capabilities. This study is innovative in terms of the relationship between dynamic capabilities and competitive advantage of the arthritis hospitals.

(2) Practical value for application

Building hospital dynamic capabilities is a core measure for arthritis specialized hospitals to maintain competitive advantage in competition. In this study, we have comprehensively analyzed the measures to build dynamic capabilities. Based on the results of empirical case studies, we systematically review the development history of general hospitals featuring treatment of arthritis and arthritis specialized hospitals in major regions of China, and analyze in detail the strategy formulation, strategy adjustment, and strategy implementation of each benchmark hospital in terms of identification of advantageous resources and capabilities and acquisition of core competitiveness. We have proposed a development strategy model and path for arthritis hospitals, which provides a scientific basis for the high-quality development of arthritis hospitals and has important practical value for application.

5.3 Research limitations

(1) This study introduces dynamic capabilities theory in formulating development strategies for arthritis hospitals. However, it needs a multi-level perspective as the interviews are only targeted at the primary administrators of the hospitals, with little consideration of the grassroots staff. The case hospitals are all tertiary hospitals because their resources and capabilities are considered relatively complete and suitable for building dynamic capabilities. However, medical institutions with relatively small sizes are not involved, and there needs to be more perspective from small medical institutions, which leads to the incompleteness of the research system.

(2) The survey of this research coincided with the outbreak of COVID-19, so the interviews were carried out via online conference software, with no opportunities for field investigation of the case hospitals and face-to-face interviews with the experts. Objective factors limited the length of the interviews with the experts in the data collection. We hope that in future studies,

researchers can visit the experts in person for more in-depth communication.

5.4 Research outlook

(1) This study analyzes the dimensions of the dynamic capabilities of arthritis hospitals through qualitative research methods. It constructs a development strategy model for arthritis hospitals based on dynamic capabilities, but the intrinsic influencing mechanism still needs further study. Subsequent studies can adopt quantitative methods to validate further the hospital's valuable resources and capabilities, core competitiveness, and the relationship between the hospital's dynamic capabilities, development strategies, and competitive advantages.

The development trend of each hospital can be systematically studied to develop evaluation indicators and assessment systems that are more practically significant for the high-quality development of public hospitals.

(2) In this study, we cannot obtain the longitudinal data of the hospitals in their development history because these operational data are generally considered commercial secrets and are only known by local health administration departments. In subsequent research, researchers can apply for the use of these data through the application of government-funded research projects or establish a strategic alliance of arthritis to achieve data sharing.

With a large number of empirical studies as the basis, we can make a more scientific analysis of the dynamic capabilities and development strategies of arthritis hospitals in China.

(3) Due to objective conditions, we did not include general hospitals or arthritis hospitals in Northeast China in the analysis, which weakens the generalizability of the research findings. Subsequent studies can increase the number of hospitals interviewed, add the perspective of middle and primary staff in the same hospital, and include primary and secondary hospitals for the overall analysis, providing a better overview of the industry development.

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Annex A: Interview Outline

Part I: Basic Situation of the Hospital/Department

1. Can you describe the basic situation of your hospital/department?

1.1 What is the basic situation of service in your hospital/department?

2. Can you briefly describe the development goals of your hospital/department?

2.1 What is the positioning and direction of your hospital/department for future development?

2.2 What are the goals of your hospital/department in the near future?

3. Can you briefly describe the opportunities for the development of your hospital/department and the major challenges and problems?

3.1 What is the impact of medical policy reforms on the development of your hospital? What are the specific aspects of the impact?

3.2 What is the impact of public health emergencies on the operation and development of hospitals?

Part II: Competitive Advantages of the Hospital/Department

4. Based on the current situation of your hospital/department, what do you think are the main competitive advantages of your hospital?

5. What factors contribute to this competitiveness of your hospital/department? What has your hospital done to improve the competitiveness of your hospital/discipline?

6. What do you think are the main reasons affecting your hospital/department to gain core competitiveness/competitive advantage? How can the core competitiveness of your hospital/department be steadily maintained?

Part III: Development of Hospital/Department Capability

7. Do you understand or know about the theory of dynamic capabilities?

8. What do you think is the role of dynamic capabilities in hospital development?

8.1 In the face of the impact of changes in the external environment (such as medical policy reform, changes in the medical environment, or people's health needs, medical technology innovation, and changes in medical models and industries), what changes do you think are

worthy of attention of the hospital? What measures should the hospital/department take to make its deployment in advance?

8.2 What measures should the hospital/department take to implement internal changes and allocation of resources?

8.3 What measures should the hospital/department take to enhance organizational flexibility to cope with the impact of changes in the external environment?

8.4 How should the hospital/department organize academic exchanges of the medical staff and encourage medical, teaching and research innovation?

8.5 What are the unique resources and capabilities of the hospital/department that are difficult to imitate and replicate, and what measures should be done to build strategic barriers?

8.6 What do you think is the role of improvement of dynamic capabilities in the hospital's high-quality development (competitive advantage)?

8.7 In addition to these five capabilities, what other capabilities do you think should be owned by the hospital/department?

Annex B: Ethical Review Form

关于“基于动态能力的关节病专科医院发展战略研究”的伦理审查意见

伦理审查受理号：2022-K-80

临床研究项目：基于动态能力的关节病专科医院发展战略研究

研究临床研究单位：上海市光华中西医结合医院

主要研究者：肖涟波

审查日期： **2022.10.28**

审查类型：初始审查

审查方式：快速审查

审查文件：

1. 课题伦理审查申请表
2. 课题访谈计划
3. 知情同意书（版本号 v1.0，版本日期 2022-10-27）

审查意见：

根据我国国家食品药品监督管理局《药物临床试验伦理审查工作指导原则》（2010年）、国家中医药管理局《中医药临床研究伦理审查管理规范》（2010年）、国家卫生计生委《涉及人的生物医学研究伦理审查办法》（2016年）、国家食品药品监督管理局《医疗器械临床试验规定》（2016年）和《药物临床试验质量管理规范》（2020年）的伦理原则，经本伦理委员会审查。

审查决定：同意

主任委员：

日期：2022.10.28

上海市光华中西医结合医院伦理委员会（盖章）

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Annex C: Relevant Tables and Figures

Figure c.1 S-SCP analysis model

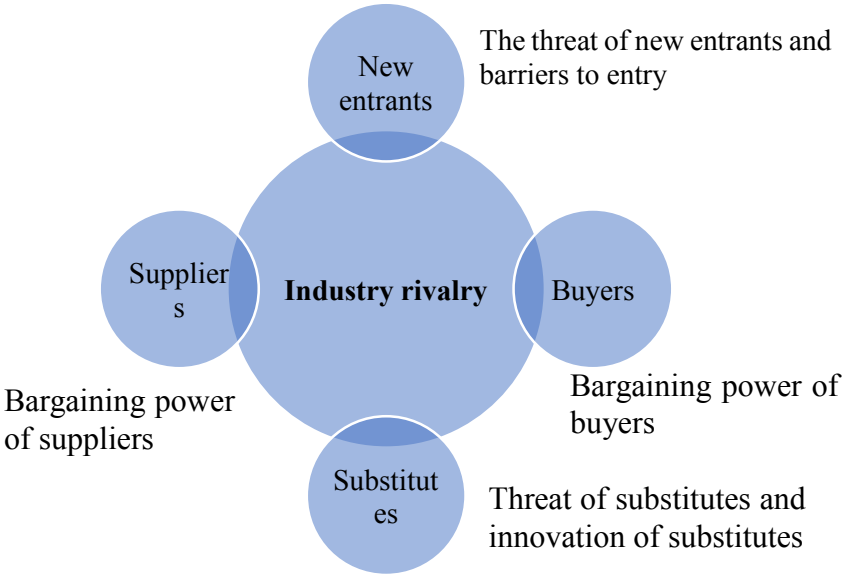

Figure c.2 Five forces model

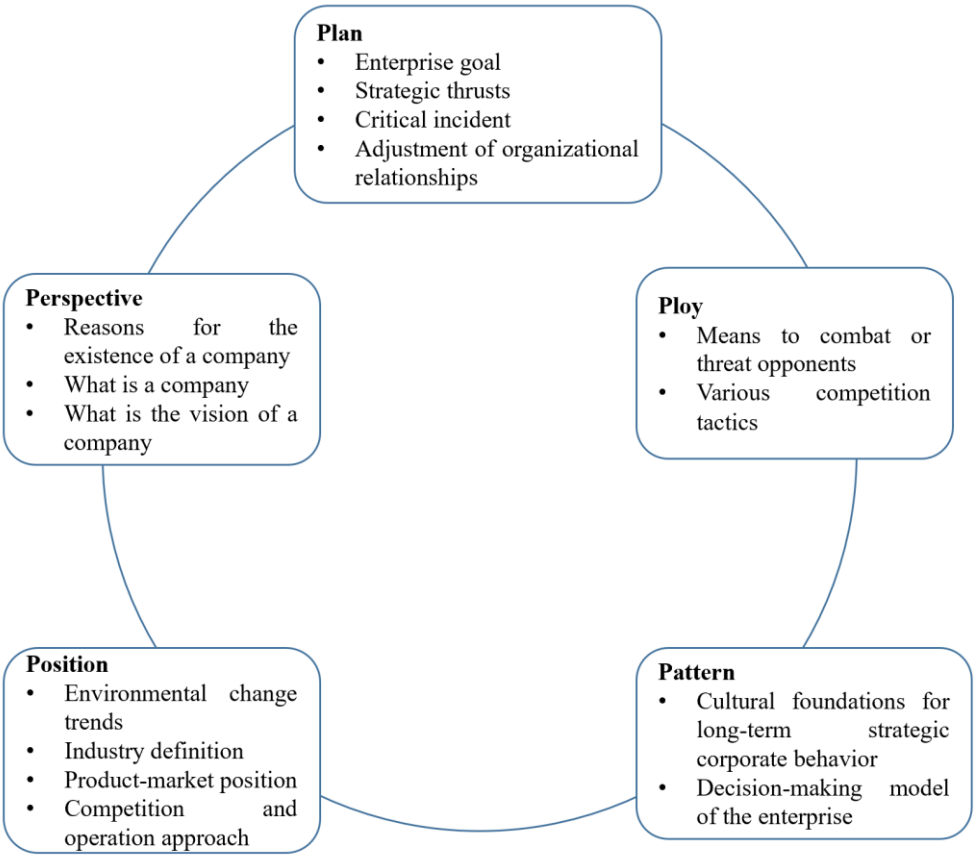

Figure c.3 5Ps of strategy