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The Relationship between Dynamic Capabilities and Brand Equity: A Case Study of Public Hospitals

ZHOU Yingyi

Doctor of Management

Supervisors:
PhD Renato Lopes da Costa, Professor,
ISCTE University Institute of Lisbon
PhD Zhang Chichen, Professor,
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Abstract

In the era of deepening healthcare reform and high-quality development, Chinese public hospitals face the imperative for strategic transformation from scale expansion to value creation. Grounded in dynamic capabilities theory and brand equity theory, this study constructs and validates a “dynamic capabilities–brand equity” relationship model applicable to the context of Chinese public hospitals. It systematically reveals the intrinsic mechanism through which dynamic capabilities of public hospitals drive the value creation of brand equity.

Through literature review and Delphi, the study developed measurement scales with good reliability and validity. It innovatively integrated the National Performance Evaluation Indicator System for Tertiary Public Hospitals into the measurement framework of dynamic capabilities. Given the constraints of medical data confidentiality, the research employed an in-depth single-case study. Utilizing a mixed-methods approach including questionnaires across 30 clinical departments, surveys of 1,500 patients, and multi-source qualitative data, combined with archival records, field research, and semi-structured interviews, the study achieved triangulation between quantitative findings and qualitative evidence.

Three key findings were obtained: First, the dynamic capabilities of public hospitals have a significant positive driving effect on brand equity. Second, there are differences in the influence paths of each capability dimension. Specifically, integrative capability plays a core driving role; sensing capability primarily affects brand loyalty; while learning capability facilitates the conversion of value through indirect paths. Finally, the study elucidates the internal process through which dynamic capabilities drive the accumulation of brand equity.

The theoretical contribution of this study lies in expanding the application boundaries of the dynamic capabilities theory within the public service sector and deepening the understanding of the value creation logic of the brand equity theory in professional service contexts. On a practical level, it provides a theoretical foundation and implementation pathways for public hospital administrators to enhance brand value and build sustainable competitive advantages in an era of transformation.

Keywords: Dynamic Capabilities; Brand Equity; Public Hospitals; Case Study

JEL: I11, I18

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Resumo

Num contexto de aprofundamento da reforma do setor da saúde e da procura nacional pelo desenvolvimento de alta qualidade, os hospitais públicos chineses enfrentam exigências de transformação estratégica, passando da expansão em escala para a criação de valor. Com base na teoria das capacidades dinâmicas e na teoria do capital da marca, este estudo constrói e valida um modelo de relação "capacidades dinâmicas - capital da marca" adaptado ao contexto dos hospitais públicos chineses, revelando de forma sistemática os mecanismos internos através dos quais as capacidades dinâmicas hospitalares impulsionam a criação de valor do capital da marca.

A investigação desenvolveu escalas de medição com fiabilidade e validade demonstradas, através de análise bibliográfica e consulta a especialistas Delphi, integrando de forma inovadora o sistema de indicadores da Avaliação de Desempenho dos Hospitais Públicos Terciários Nacionais Chineses no quadro de medição das capacidades dinâmicas. Condicionada pelos requisitos de confidencialidade dos dados médicos, foi conduzida uma análise aprofundada de estudo de caso único, utilizando inquéritos por questionário em 30 departamentos clínicos, inquéritos a 1.500 pacientes e múltiplas fontes de dados qualitativos, incluindo registos arquivísticos, investigações de campo e entrevistas semiestruturadas, alcançando assim uma triangulação metodológica através da integração de evidências quantitativas e qualitativas.

Três conclusões principais emergiram: Primeiro, as capacidades dinâmicas dos hospitais públicos demonstram efeitos impulsionadores positivos significativos sobre o capital da marca. Segundo, diferentes dimensões das capacidades dinâmicas apresentam percursos diferenciados, a capacidade de integração atua como motor central, a capacidade de perceção influencia sobretudo a lealdade à marca, enquanto a capacidade de aprendizagem concretiza a conversão de valor através de vias indiretas. Por fim, o estudo clarifica o processo endógeno através do qual as capacidades dinâmicas impulsionam a acumulação do capital da marca.

As contribuições teóricas desta investigação residem na expansão das fronteiras de aplicação da teoria das capacidades dinâmicas no domínio dos serviços públicos e no aprofundamento da compreensão da lógica de criação de valor na prestação de serviços profissionais, no âmbito da teoria do capital da marca. A nível prático, fornece fundamentos

teóricos e caminhos de implementação para que os gestores de hospitais públicos possam fortalecer o valor da marca e construir vantagens competitivas sustentáveis nesta era de transformação.

Palavras-chave: Capacidades Dinâmicas; Capital da Marca; Hospitais Públicos; Estudo de Caso
JEL: I11, I18

摘要

在深化医改与高质量发展的时代背景下，中国公立医院面临从规模扩张向价值创造的战略转型需求。本研究以动态能力理论与品牌资产理论为基础，构建并验证了适用于中国公立医院情境的“动态能力-品牌资产”关系模型，系统揭示了公立医院动态能力驱动品牌资产价值创造的内在机制。

研究通过文献分析、德尔菲专家咨询开发了具有良好信效度的测量量表，创新性地将国家三级公立医院绩效考核指标体系融入动态能力测量框架。基于医疗数据保密性的现实约束，采用单案例深度研究，通过 30 个临床科室的问卷调查、1500 名患者调研及多源质性数据，结合档案资料、实地调研、半结构访谈，实现了量化研究与质性证据的三角互证。

研究获得三个关键发现：首先，公立医院动态能力对品牌资产具有显著正向驱动作用；其次，动态能力各维度呈现差异化作用路径，其中整合能力发挥核心驱动作用，感知能力主要影响品牌忠诚度，学习能力则通过间接路径实现价值转化；最后，研究揭示了动态能力驱动品牌资产积累的内在过程。

本研究的理论贡献在于拓展了动态能力理论在公共服务领域的应用边界，深化了品牌资产理论在专业服务情境下的价值创造逻辑。在实践层面，为公立医院管理者在变革时代提升品牌价值、构建可持续竞争优势提供了理论依据和实施路径。

关键词：动态能力；品牌资产；公立医院；案例研究

JEL: I11, I18

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Chapter 1: Introduction

1.1 Overview

In this era of deepening healthcare system reform and high-quality development, public hospitals in China are undergoing a strategic transformation from “scale expansion” to “value creation”. Faced with increasingly fierce market competition, diverse patient needs, and rapidly advancing medical technologies, the sustainable development of public hospitals is confronted with severe challenges. In this environment, traditional advantages in resources and scale can no longer sustain their competitiveness. Therefore, building and enhancing outstanding brand equity has become a strategic cornerstone for public hospitals to earn social trust, attract top talent, and achieve long-term development.

However, the construction of brand equity is not an overnight task. It urgently requires an internal driving force that can guide hospitals in continuously transforming and innovating within a dynamic and complex environment. Thus, this thesis introduces the cutting-edge dynamic capabilities theory from strategic management, aiming to systematically explore the relationship and underlying mechanisms between dynamic capabilities and brand equity in public hospitals. This endeavor holds significant theoretical value and practical urgency.

This study follows the logical sequence of “theory construction → empirical testing → mechanistic explanation”. First, through literature analysis and the Delphi expert consultation method, theories of dynamic capabilities and brand equity, originally derived from corporate strategic theory, are adapted to the local and industry-specific context. The core constructs of dynamic capabilities and brand equity in the context of public hospitals are independently defined, and measurement scales with good reliability and validity are developed, laying the conceptual and measurement foundation for subsequent research.

Most critically, to ensure the policy validity and real-world explanatory power of the measurement tools, the developed measurement scale of dynamic capabilities has been deeply integrated with the performance evaluation indicators for national tertiary public hospitals and the core assessment criteria of provincial health administrative departments. This design significantly enhances the precision and practical value of the measurements.

However, as the relevant data involve core sensitive information on hospital operations and management and are strictly constrained by medical data confidentiality regulations, cross-institutional comparative studies face considerable difficulties in data acquisition.

Given these methodological constraints, this study adopts a single-case in-depth research design, selecting Guangdong Second Provincial General Hospital (hereinafter referred to as "GD2 General Hospital"), a provincial-level tertiary Grade A public hospital located in Guangzhou, Guangdong Province, as the empirical research subject. This strategy achieves a reasonable balance among data quality, research ethics, and depth of inquiry. It enables the study to thoroughly investigate the complex pathways between various dimensions of dynamic capabilities (sensing, learning, and integrating) and brand equity (loyalty, perceived quality, brand associations, and brand awareness), thereby providing micro-level evidence within an authentic management context for the theoretical model.

Furthermore, this study employs a mixed-methods approach, collecting primary data on the hospital's dynamic capabilities and brand equity through questionnaires (covering 30 clinical departments and 1,500 patients), quantitative analysis, and case studies. Statistical methods are applied to empirically test the theoretical hypotheses. Subsequently, in-depth interviews, archival analysis, and field observations are conducted to provide mechanistic explanations and contextual interpretations of the quantitative results. This approach reveals the intrinsic process through which dynamic capabilities drive the accumulation of brand equity, thus achieving triangulation between quantitative and qualitative research.

The study yields the following findings. First, the dynamic capabilities of public hospitals serve as a significant driving factor for brand equity, with a markedly positive relationship existing between the two. Second, there are differences in the influence paths of each capability dimension: integrative capability comprehensively drives all dimensions of brand equity; sensing capability primarily enhances brand loyalty; and learning capability produces indirect effects by strengthening the former two. These conclusions validate the core proposition at both the holistic and dimensional levels, while revealing its underlying complex mechanisms.

In summary, the theoretical contribution of this research lies in constructing and validating a "dynamic capabilities–brand equity" relationship model applicable to the context of Chinese public hospitals. This deepens the understanding of both the boundary of action for dynamic capabilities theory in the public service sector and the value-creation logic of brand equity theory within professional service domains. On a practical level, the research

findings provide concrete pathways and prioritized strategies for public hospital administrators to enhance brand value and achieve sustainable competitive advantage in an era of transformation.

1.2 Research problem

Brand competition is the concentrated expression of the core competitiveness of enterprises. As a critical intangible asset, the importance of brand is now recognized as being on par with traditional factors of production such as land and capital. In a market economy, a brand serves as the core pathway for an enterprise to differentiate itself from competitors and secure advantages. The competition involving elements like technology and talent ultimately manifests in the form of brand competition. It comprehensively reflects the strengths of an enterprise across multiple dimensions, including product, technology, and management, thereby constituting the most direct embodiment of its core competitiveness (Guan & Gao, 2023; Hu, 2019; Huang et al., 2020).

Brand management practices aim to establish brand equity (Guan & Gao, 2023; Huang et al., 2020; Özgül & Cengiz, 2020). Strong brand equity is positively correlated with the appeal of a product to consumers (Ernawaty et al., 2020; Guan & Gao, 2023; Huang et al., 2020).

A brand is a valuable intangible asset that is difficult to imitate (Guan & Gao, 2023; Huang et al., 2020; Roberts & Dowling, 2002). Research on brand equity in the field of enterprise management is also applicable to public hospitals (Guan & Gao, 2023; Huang et al., 2020; Kemp et al., 2014). A hospital brand represents the service commitment and product features formed through its long-term operational or public-service activities, such as medical services, teaching, and scientific research. It is the sum of society's and patients' value orientations toward the hospital (Chen et al., 2022).

With the deepening of healthcare reform, market-opening policies have prompted changes in the traditional landscape. Both Chinese and international medical institutions are entering or expanding through various models, intensifying market competition. Informatization has made it easier for patients to access information and seeks high-quality services, making the influence of a hospital's brand increasingly critical (Long et al., 2018). Although large public hospitals have currently established standardized systems for managing general resources, the maintenance and enhancement of intangible assets such as brand remain inadequate.

1.2.1 Weakness of brand management in public hospitals

With the continuous deepening of China's healthcare system reform and the increasingly fierce market competition, hospitals are now compelled to confront the realities of the new landscape and market dynamics, and to develop a strong awareness of both business operations and brand management (Hu, 2021).

Compared to international medical giants and privately-run or foreign-funded medical institutions that have established professional brand management systems (including dedicated departments and full-time personnel), brand management in China's large tertiary Grade A public hospitals remains underdeveloped. Most hospitals do not treat brand management as an independent function. They not only lack specialized teams (existing staff often hold part-time roles with insufficient professional expertise), but are also constrained by traditional management mindsets, with brand management work still remaining largely at the level of image promotion (Liu et al., 2024).

1.2.2 Homogenization of public hospital brands

At its core, the brand strategy of a hospital aims to differentiate or outperform competitors through distinctive development, highlighting its medical technology, quality, and service. This strategy is designed to evoke positive brand associations among patients and encourage them to choose the hospital preferentially (Cao et al., 2020). To secure a share in this highly competitive market environment, hospitals must establish an appropriate brand positioning strategy, transforming their medical services into a brand that comes to mind first when patients have healthcare needs (Wu & Yang, 2022).

Currently, although some hospitals possess an awareness of brand management, their positioning remains vague, failing to identify and leverage their unique strengths and resources based on their actual conditions. Their communication strategies are often simplistic, lacking a systematic approach and innovative methods, which makes it difficult to effectively attract patients. Brand development in large public hospitals often falls into simple imitation, failing to establish distinctive characteristics (Liu, 2023). Neglecting the differences among hospitals, such as their developmental trajectories and disciplinary strengths, and engaging in uncritical replication only leads to brand homogenization, significantly undermining the effectiveness of communication efforts.

1.2.3 Lack of brand strategy in public hospitals

In recent years, with the continuous deepening of healthcare system reform, the expanding implementation of hierarchical diagnosis and treatment models, and the vigorous growth of privately-run medical institutions, open competition in the medical market has further intensified. Amplified by continuous economic development and improvements in the quality of life, public health awareness has rapidly grown, and healthcare demands have significantly increased. Public hospitals now face severe impacts and challenges across various aspects, with mounting survival pressures (Xiong et al., 2023).

In terms of fiscal investment, since the implementation of the new healthcare reform, fiscal allocations to public hospitals have been progressively reduced, while their mandated functions have not diminished. Faced with operational pressures, public hospitals need to continuously increase investment in fixed assets and hospital infrastructure, further escalating operational pressures (Yan, 2019). Moreover, following the removal of medicine markups at public hospitals nationwide in 2017, along with ongoing adjustments to medical insurance policies and payment methods, the profit margins for large tertiary Grade A public hospitals have been further constrained.

Regarding the distribution of medical resources, the new healthcare reform has enhanced the resource allocation and service capacity of primary-level medical institutions through the hierarchical diagnosis and treatment system. It has also promoted the extension of quality resources from public hospitals to communities, effectively alleviating the imbalance in medical resource distribution (Wang & Jia, 2021). Additionally, internet-based healthcare has evolved from light consultation and appointment booking to online diagnosis, treatment, and e-prescription services, significantly broadening patient access to care and improving service convenience and efficiency (Zhang & He, 2023).

Faced with developmental challenges arising from policy changes, peer competition, patient loss, reduced fiscal support, and growing operational pressures, when competition among hospitals in areas like technology, quality, and cost yields diminishing returns despite substantial efforts, brand competition has become the primary means of rivalry among hospitals. How large tertiary Grade A public hospitals can establish their own brands, achieve a distinctive breakthrough in an intensely competitive market, and sustain a leading position among their peers presents a critical challenge for hospital administrators. Hamdi et al. (2026) explicitly stated that customer-based brand equity (CBBE) has become an increasingly important determinant of hospital competitiveness.

This study proposes that dynamic capabilities can serve as a novel research framework for public hospitals to manage brand equity and secure sustainable competitive advantage. Corporate competitiveness originates from its resource and capability base (Nason & Wiklund, 2018), encompassing dimensions such as tangible assets, intangible assets, and human capital (Pero & Arszuowicz, 2024). The dynamic capabilities theory has evolved from the resource-based view, while brand equity, as a core component of intangible assets, exhibits cyclical, competitive, dynamic, and non-linear characteristics in its development (Guo & Yang, 2020). The two share an intrinsic theoretical alignment in adapting to dynamic environments and achieving sustainable development through continuous innovation.

The application of dynamic capabilities and brand equity theory has extended from corporate management to the realm of public organizations. Against the backdrop of intensifying market competition and environmental uncertainty, hospitals face the core challenge of how to consistently deliver high-quality and efficient medical services in dynamic conditions. This has spurred increasing scholarly attention toward integrating dynamic capabilities theory into hospital management, thereby offering new analytical perspectives and strategic frameworks for the sustainable development of medical institutions.

Similar to enterprises, both public and private sectors are influenced by modern global business trends, social modernization, and growing demographic demands, which indicates that the public sector needs to adapt to current political, social, cultural, and technological trends (Zlatanović et al., 2022). Taking health service institutions as an example, their dynamic environment encompasses changes in policies, increases in health service costs, shifts in patient demands, advances in medical technology, and constant changes in managers due to internal managerial rotation systems (Schneider, 2020).

However, through a systematic review of Chinese and international literature, this study finds that current applications of dynamic capabilities theory in hospital management primarily focus on strategic management and performance evaluation (Deng et al., 2023). Although some studies have compared literature and summarized factors related to capacity building in large public hospitals, such as medical technology, service quality, talent development, and research innovation (Hong, 2021), research on the relationship between dynamic capabilities and brand equity remains notably insufficient. Existing scattered discussions have yet to form a systematic and in-depth analysis, indicating a significant research gap in this field.

To examine the current state of research, a literature search was conducted on “dynamic capabilities” in Google Scholar for the period 2023–2025. The results returned 5,570 documents when combined with “hospital”, 2,490 documents with “brand equity”, and zero relevant documents with “hospital brand equity/equities”. In the PubMed database (covering the past five years), corresponding searches yielded 11, 0, and 0 documents, respectively. On the China National Knowledge Infrastructure (CNKI) platform, the respective results were 16, 10, and 0 documents. In summary, research exploring the relationship between dynamic capabilities and brand equity in hospitals remains markedly limited in China and beyond.

It is worth noting that Teece (2018), the founder of dynamic capabilities theory, described dynamic capabilities and strategy on his official webpage, stating, “Beyond the Next Big Thing: Stewardship of Intangible Assets through Dynamic Capabilities”. Teece’s outlook on future research directions further underscores the value of this research trend.

1.3 Research questions

Based on the dynamic capabilities theory and the theory of brand equity management, this study aims to explore the following core questions: (1) How should the dynamic capabilities of tertiary Grade A public hospitals in China be defined? (2) How should the brand equity of tertiary Grade A public hospitals in China be defined? (3) What are the key dimensions for measuring the dynamic capabilities of hospitals? (4) What are the key dimensions for measuring hospital brand equity? (5) Through what mechanisms do dynamic capabilities influence brand equity within large tertiary Grade A public hospitals? (6) In the hospital context, what key factors drive the impact of dynamic capabilities on brand equity?

1.4 Research purpose

Based on the dynamic capabilities theory and the theory of brand equity management, this study seeks to develop a model of the relationship between dynamic capabilities and brand equity in large tertiary Grade A public hospitals and to analyze its influencing mechanisms. The goal is to provide both a theoretical foundation and practical recommendations for hospital management. At the strategic level, this study will assist administrators in formulating more effective strategies. In terms of competition, it will support hospitals in achieving differentiation and sustainable development. Regarding performance, it will help identify operational strengths and weaknesses, enabling the design of targeted improvement

plans. From a resource allocation perspective, it will help decision-makers to identify the dynamic capabilities that contribute most significantly to building brand equity, thereby optimizing resource distribution.

1.5 Research technical pathway

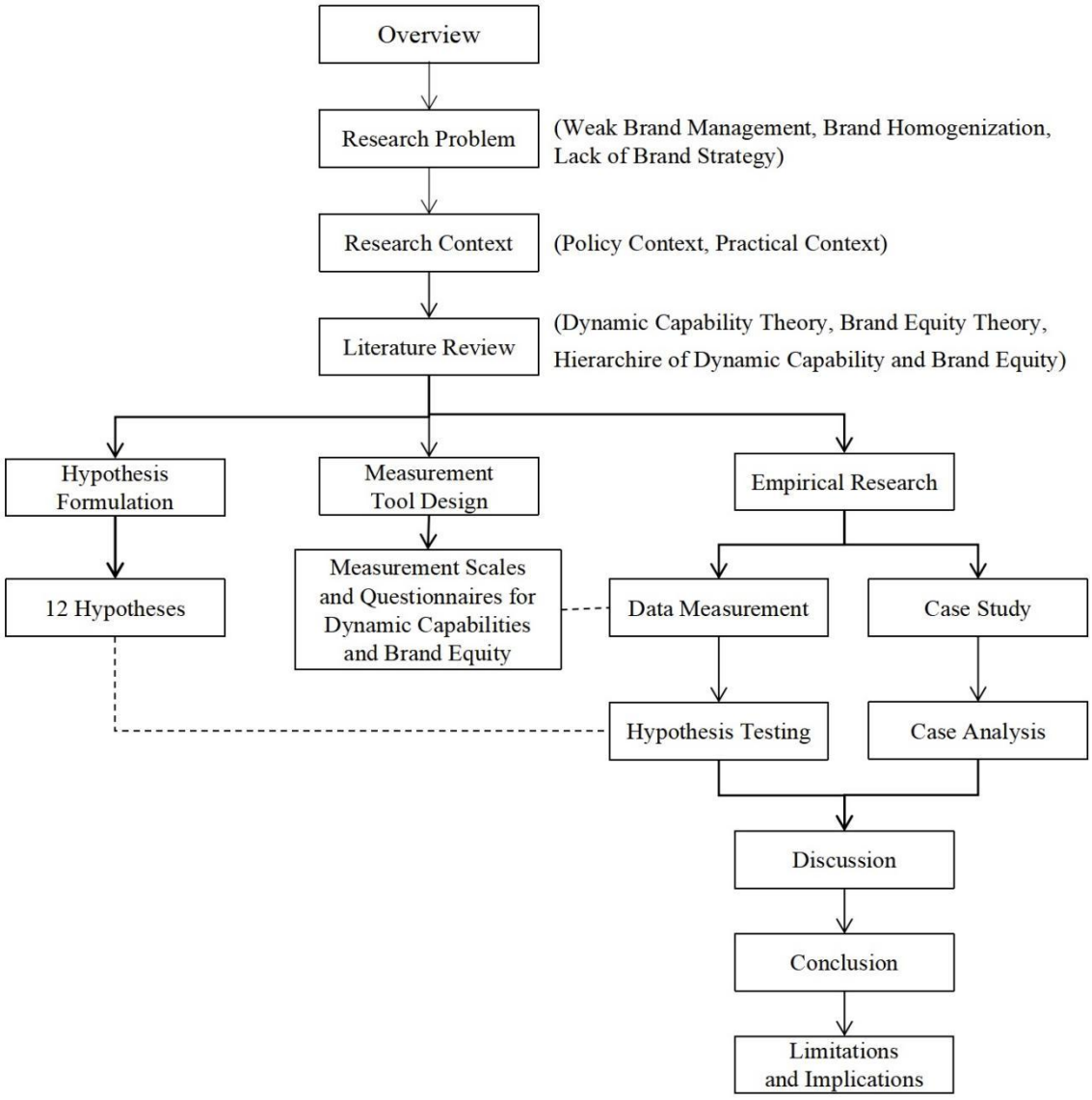


Figure 1.1 Research technical pathway

1.6 Research contributions

This thesis takes tertiary Grade A public hospitals in China as its research subject. Grounded in the dynamic capabilities theory and the theory of brand equity management, it employs rigorous methods including systematic literature analysis, the Delphi expert consultation, questionnaire surveys, and case studies to systematically explore the conceptualization and dimensions of dynamic capabilities and brand equity within public hospitals, as well as the mechanisms through which dynamic capabilities influence brand equity.

This research not only addresses the theoretical understanding of organizational dynamic capabilities and brand equity within the unique and complex context of healthcare services, but also empirically reveals the pathways through which these two constructs interact.

This section will systematically elaborate on the contributions of this study to the relevant theoretical fields, which are primarily reflected in the following four aspects: conceptual definition, scale development and measurement, empirical validation, and methodology.

1.6.1 Contributions of conceptual definition

This study has achieved two foundational breakthroughs at the theoretical level: systematically constructing a conceptual framework of dynamic capabilities applicable to Chinese public hospitals, and adapting brand equity theory to the healthcare industry context.

By introducing the dynamic capabilities theory (with its origins in corporate competition) and brand equity theory (developed within commercial marketing) into the context of public hospitals, a setting defined by its public welfare nature, strong institutional constraints, and knowledge-intensive operations, this study accomplishes a paradigm shift in management theory from commercial competition to public-benefit sustainable development. Through independent conceptual elaboration, it establishes a foundation for empirically examining the relationship between dynamic capabilities and brand equity in non-profit public service organizations, thereby providing a conceptual basis for subsequent research.

Specifically, this study enhances the explanatory power of the theories for the specific institutional and practical contexts of public hospitals by redefining and deepening the

dimensions of dynamic capabilities (sensing, learning, and integrating) and the dimensions of brand equity (loyalty, perceived quality, brand associations, and brand awareness).

1.6.1.1 Conceptualization and contextualization of hospital dynamic capabilities

The dynamic capabilities theory originated in the competitive corporate sphere, and its core lies in the ability of an organization to sense opportunities and reconfigure resources to adapt to rapidly changing environments. However, there remains a theoretical gap regarding the applicability and specific manifestation of this theory within public service organizations, characterized by their non-profit nature, strong institutional constraints, and professional intensity, particularly in the context of Chinese public hospitals.

To address this gap, this study introduces dynamic capabilities theory into the specific organizational context of Chinese public hospitals through systematic conceptual definition and dimensional reconstruction, thereby completing the process of theoretical contextualization and establishing an adapted conceptual framework.

This work not only accomplishes a paradigm shift for dynamic capabilities theory from commercial competition to public-benefit sustainable development, but also facilitates its extension and refinement from commercial enterprises to public service organizations. Consequently, it provides an operational conceptual foundation and measurement basis for conducting empirical research on dynamic capabilities within complex non-profit service organizations.

Firstly, through a systematic literature review and in consideration of the actual conditions of Chinese public hospitals, this study proposes an independent definition of dynamic capabilities. Based on this, it elaborates in depth on the three core dimensions that constitute dynamic capabilities (sensing capability, learning capability, and integrative capability), providing a clear definition for each dimension.

This study defines the hospital dynamic capabilities as follows: the ability of public hospitals to continuously sense environmental changes in a timely manner, rapidly learn and acquire information aligned with the environment, apply theoretical knowledge and technical skills, adapt to changes, reconfigure and integrate existing resources, deliver high-quality and efficient healthcare services, meet public health needs, and ultimately build a sustainable capacity that supports the long-term development of the hospital.

Specifically, hospital sensing capability refers to the hospital’s sensitivity to changes and trends in its internal resources and core competencies, as well as to external environmental shifts such as healthcare demands, patient experiences, and policy requirements. It further

denotes the ability to respond rapidly, strengthen management, and optimize services in order to meet or adapt to these changes.

Hospital learning capability refers to the ability of key hospital decision-makers and the entire organization to continuously acquire, evaluate, integrate, and apply internal and external medical knowledge, management knowledge, and practical experience through effective mechanisms amid the continuous reform and development in the field of medical and health care. This capability aims to continuously enhance medical technical proficiency, optimize service processes, improve management efficiency, and thereby provide patients with higher-quality and more efficient healthcare services.

Hospital integrative capability refers to the ability of a hospital, through the efforts of key decision-makers and the organization, to effectively integrate, optimally allocate, and synergistically utilize various internal and external resources (such as medical resources, human resources, equipment, technology, and information), as well as service processes, management systems, and mechanisms. This capability aims to enhance the hospital's disciplinary standards, operational efficiency, quality of healthcare services, and management proficiency, thereby providing patients with more efficient, continuous, and comprehensive medical care.

Secondly, this study deepens the theoretical connotation of dynamic capabilities within the dual context of public service and institutional complexity. In the setting of public hospitals, dynamic not only refers to responding to market demands and technological changes, but more critically encompasses adapting to institutional shocks such as reforms in healthcare insurance policies, the removal of medicine markups, and shifts in performance evaluation orientations, as well as sustaining ongoing insight into the dynamics of patient needs and evolving expectations for experience.

Therefore, the three capabilities, namely sensing capability, learning capability, and integrative capability, as defined in this study, all inherently incorporate the dual roles of public hospitals as both policy implementers and market competitors.

Specifically, the connotation of hospital sensing capability must encompass a sensitive awareness of the impact from institutional constraints such as healthcare payment reforms and pharmaceutical policies, while simultaneously enabling the accurate identification of ongoing shifts in patient experience, service demands, and health expectations. Particularly during the current critical policy window in China, marked by initiatives like centralized procurement and DRG payment reform, this comprehensive ability to anticipate and

understand both institutional changes and market demands forms the prerequisite for the strategic adjustments of hospitals.

The focus of hospital learning capability, therefore, is reflected in the need for hospitals not only to pursue technological innovation to gain market advantage, but also to rapidly learn and internalize new policy requirements, converting them into specific clinical pathways, management standards, and service processes. This ensures organizational legitimacy and operational compliance. For instance, mastering DRG/DIP payment rules and converting them into clinical and managerial practices has become a new core component of hospital learning capability. This highlights the specific directionality and urgency of learning within a context of strong institutional constraints.

The challenge of hospital integrative capability lies in the demand for hospitals to achieve coordinated reconstruction of internal and external resources while balancing public welfare objectives and operational efficiency. This requires breaking down the traditional siloed discipline-based structure and establishing collaborative processes and organizational frameworks capable of simultaneously responding to policy-driven efficiency requirements, patient service experience, and medical professional quality.

1.6.1.2 Definition and industry-specific application of hospital brand equity

The brand equity theory originates from the field of commercial marketing. Its core paradigm emphasizes how brands create market value and occupy consumer mindshare to secure competitive advantages for enterprises. However, in the healthcare sector characterized by its public welfare nature, professional authority, and the non-storability of services, the connotative structure, formation mechanisms, and value realization pathways of brand equity exhibit significant specificity. This distinctiveness renders traditional theoretical frameworks difficult to apply directly within the context of public service organizations.

This study reframes and adapts the brand equity theory for the specific institutional context of Chinese public hospitals. This process not only tailors the theory to the healthcare service field, but also broadens its theoretical scope and explanatory power.

Firstly, through a systematic literature review and guided by a public-service orientation and a patient-centered value philosophy, this study proposes an original conceptual definition of hospital brand equity, tailored to the context of Chinese public hospitals.

Based on this foundation, the study elaborates on the four core dimensions constituting hospital brand equity, namely, brand loyalty, brand quality, brand associations, and brand awareness, and provides clear operational definitions for each.

This study defines hospital brand equity as an intangible asset formed through the processes of differentiation and sustained value creation in healthcare service delivery, comprising elements such as medical technology, service quality, management efficacy, patient trust, and social responsibility. It represents the cognitive and emotional connection established by patients and the public based on these elements, as well as the evaluation outcome derived from them by government authorities.

Specifically, the hospital brand loyalty refers to the persistent healthcare-seeking behavior and active recommendation intention demonstrated by patients in the healthcare service sector, rooted in their trust in, satisfaction with, and emotional attachment to a specific public hospital. It manifests as a psychological inclination and behavioral pattern wherein, despite competition from other medical institutions and various external influencing factors, patients consistently choose and recommend that public hospital and are willing to pay relatively higher costs for the medical services it provides.

The hospital perceived quality refers to the objective experiences, subjective perceptions, and evaluations of patients and the public regarding the comprehensive quality of medical and health services provided by public hospitals, including professional competence, service quality, and related facilities and environment.

The hospital brand association refers to the multi-layered cognitive and emotional connections activated when patients encounter or recall a public hospital, relating to medical service quality, technical capability, service processes, public welfare nature, and emotional experience. Specifically, it constitutes a multi-level and dynamic cognitive network formed by patients based on direct experience or indirect information, encompassing the hospital's technical capabilities, service processes, public welfare nature, emotional interactions, and symbolic systems. The strength and uniqueness of such associations are influenced by the interplay of government roles, communication strategies, and patient values.

The brand awareness refers to the dynamic recognition, value assessment, and behavioral decision-making by patients and the public regarding hospital brand elements during their engagement with medical services. It is formed through direct experience, social communication, and policy understanding. Specifically, it drives healthcare choices and brand loyalty through dual pathways: rational evaluation (such as perceived technical credibility) and emotional resonance (such as privacy protection).

Secondly, this study deepens the theoretical connotation of brand equity within the dual context of professional services and public trust. While brand equity theory has matured in

the field of marketing, its classic models were primarily established on the basis of tangible products and market competition, emphasizing the creation of market value and shareholder benefits through dimensions such as brand associations, and brand quality. However, in the healthcare sector, characterized by the intangibility of services, professional authority, and the distinctive nature of public trust, the logic of value creation, constituent dimensions, and mechanisms of brand equity exhibit fundamental differences.

By applying brand equity theory to the unique context of public hospitals, which have the dual attributes of professional services and public trust, this study expands the specific connotations of various dimensions of hospital brand equity.

In the healthcare sector, the brand loyalty is defined not merely by the repetitive visits of patients, but more profoundly, by a high level of trust-based reliance and a demonstrated willingness to support the institution during critical situations. For instance, For example, during trust-testing moments such as public health emergencies or doctor-patient disputes, patients still choose to trust and support the hospital. This reflects a deeper form of loyalty grounded in professional trust and emotional connections, which goes far beyond mere repetitive transactional behavior.

The hospital brand quality hospital is formed through a multidimensional and complex judgment process. It integrates the comprehensive evaluations of patients across three key aspects: technical quality (such as diagnostic and treatment proficiency, and surgical outcomes), functional quality (such as service efficiency, healthcare experience, and doctor-patient communication), and environmental quality (such as medical facilities, and spatial comfort). Crucially, due to the intangible and specialized nature of medical services, patients often rely on “tangible evidence” (such as hospital environment, and qualifications of physicians) and “interactive processes” (such as communication attitudes) to infer the “technical outcomes” that are difficult to assess directly. Consequently, functional and emotional experiences hold significant weight in shaping perceptions and evaluations of the hospital brand quality.

The uniqueness of brand association lies in its strong connection to a hospital’s medical expertise, disciplinary reputation, and image of humanistic care. For instance, discipline-based brand associations built on professional strengths, such as “authority in cardiovascular treatment” or “trusted destination for pediatric care”, create a distinctive, positive, and differentiated brand image in the minds of patients. This constitutes the core value of the hospital brand equity.

Finally, brand awareness for public hospitals exists on multiple levels. It goes beyond simple recognition of name or geographical location to include a deeper understanding of their leading specialties, distinctive technologies, authoritative experts, and core service philosophy. This deeper awareness translates into action: when a specific health need arises, patients can promptly and accurately identify the hospital as their preferred choice. This type of expertise-based brand recognition is a key driver in their healthcare decision-making.

1.6.2 Contributions of scale development and measurement

This study makes three key methodological advances in scale development and measurement: First, measurement tools for dynamic capabilities and brand equity were developed based on the context of Chinese public hospitals, with content validity ensured through the Delphi expert consultation method. Second, a cross-level data aggregation approach was employed to effectively address the issue of data scarcity in single-case studies. Third, a measurement system with good reliability and validity was established through multi-source data collection and validation, providing methodological assurance for subsequent research.

1.6.2.1 Systematic scale development through the Delphi method

This study rigorously applied the standardized Delphi method to develop the measurement scale. Two rounds of consultation were conducted with a panel of 30 senior experts from medical institutions, universities, and research institutes. All panelists possessed over 15 years of relevant experience and held senior professional titles, which ensured the expert authority and methodological rigor of the study. Through these two rounds of iterative evaluation focused on the indicator system and specific questionnaire items, a measurement scale with strong content validity was finalized.

The scale constructed through the two rounds of Delphi expert consultation holds theoretical value in three aspects.

First, it moves beyond simply applying existing measurement tools for corporate dynamic capabilities. By incorporating distinctive organizational features of public hospitals, such as their public-welfare mandate and stringent regulatory environment, the study develops dimensions for measuring dynamic capabilities that are more aligned with the healthcare sector. This represents a context-specific adaptation of the theoretical instrument.

Second, the study systematically introduces brand equity theory from the commercial domain into the public service sphere. Based on this, it establishes a measurement framework for the hospital brand equity, which comprises four core dimensions: brand

loyalty, brand quality, brand associations, and brand awareness. This advances the application of the theory within non-profit professional service organizations.

Finally, during the research process, full professors or equivalently senior experts accounted for 80% of the expert panel, and their opinions showed a high degree of consistency. Methodologically, this ensures the content validity and practical applicability of the scale within the specific context of China's healthcare system.

1.6.2.2 Innovative exploration based on multi-source data aggregation and measurement validity

In terms of reliability and validity testing, this study implemented an innovative measurement scheme.

Through two rounds of Delphi expert consultation, the study developed two instruments: the Public Hospital Dynamic Capability Measurement Questionnaire (Version 2.0) and the Public Hospital Brand Equity Measurement Questionnaire (Version 2.0). These questionnaires were subsequently validated by using a strategy of multi-source data collection and aggregation analysis.

Data on dynamic capabilities were collected by surveying core administrators from 30 clinical departments, measuring the hospital's organizational adaptability and change execution capability under institutional environment and competitive pressure. Data on brand equity were obtained through a random sample survey of 1,500 inpatients from the corresponding departments, reflecting the external market's actual perception and evaluation of the hospital brand.

This study introduces three key methodological innovations.

First, it collected data from two distinct sources: heads of 30 clinical departments and a survey of 1,500 patients, and has verified the strong reliability and validity of the scale through methods including exploratory factor analysis and multiple regression analysis.

Second, by leveraging the internal aggregation logic of the hospital dynamic capabilities and the synergistic patient assessments of brand equity, the study successfully aggregated department-level data to the hospital level for analysis. The empirical results confirm the strong reliability and validity of the data, as evidenced by their successful passage of correlation and multiple regression analyses, which led to the validation of all 12 research hypotheses.

Finally, through triangulation of multiple data sources, including archival documents, field visits, and transcripts of semi-structured interviews, the study ensured data reliability

and validity. This process further demonstrates that, with rigorous methodological controls, a single-case study design can indeed yield robust quantitative results. Consequently, this work provides a novel methodological approach for studying the capabilities of public service institutions.

1.6.3 Contributions of empirical testing

1.6.3.1 Overall positive driving mechanism of dynamic capabilities on brand equity

The results of multiple regression analysis indicate that the hospital dynamic capabilities exert a significant positive influence on its brand equity (p=0.004<0.01). This finding provides empirical support for the theoretical proposition that dynamic capabilities constitute a fundamental source of brand value in hospitals.

This conclusion not only enriches the existing theoretical discussions in the literature on the relationship between dynamic capabilities and organizational performance, such as the classic proposition by Teece et al. that dynamic capabilities enhance organizational performance, but also, for the first time, systematically reveals the direct driving effect of dynamic capabilities on brand equity within the context of public healthcare institutions.

It is worth noting that the driving effect verified in this study highlights the internal mechanism through which dynamic capabilities are ultimately transformed into sustainable brand competitive advantages in the medical field characterized by both institutional constraints and professional attributes. This is achieved by enabling hospitals to respond to policy changes, patient needs, and optimize resource allocation.

1.6.3.2 Central driving role and multidimensional impact pathways of integrative capability

Empirical results indicate that integrative capability (X3) has a significant positive effect on all four dimensions of brand equity—brand loyalty, brand quality, brand associations, and brand awareness (thus supporting hypotheses H9–H12). Furthermore, its standardized coefficients (β ranging from 0.450 to 0.485) are substantially higher than those of sensing capability and learning capability.

This finding not only supports the view in dynamic capabilities theory that “resource integration is a critical stage in value creation”, but also reveals the core position of integrative capability across hospital brand construction by verifying its comprehensive promoting effect on the four dimensions of brand equity.

Integrative capability strengthens every dimension of the hospital brand equity. It does so by breaking down departmental barriers, optimizing service processes, and restructuring resource systems. These actions establish mechanisms for cross-departmental collaboration and standardize service pathways, which create a coherent, high-quality patient experience and thereby strengthen the brand.

1.6.3.3 Boundary effect and differential pathways of sensing capability

This study finds that the sensing capability of a hospital significantly influences only brand loyalty (supporting hypothesis H1), while its effects on perceived quality, brand associations, and brand awareness do not reach statistical significance (thus hypotheses H2–H4 are not supported).

This result reveals a distinct functional pattern of sensing capability in building the hospital brand equity. It functions primarily at the "gateway" to brand relationships, building and maintaining patient loyalty through keen insight into policy trends and patient needs. Its influence, however, is limited when it comes to enhancing objective perceptions of medical quality or fostering rich brand associations.

The identification of this boundary effect enriches the functional stratification within dynamic capabilities theory, providing important empirical evidence for understanding the differentiated roles that various capability dimensions play in brand construction.

1.6.3.4 Potential mediating mechanisms and indirect value of learning capability

Empirical results indicate that the direct effects of learning capability on all dimensions of brand equity are statistically non-significant (Hypotheses H5–H8 are not supported).

This finding holds significant theoretical implications. It suggests that within public hospitals, the contribution of learning capability (such as knowledge acquisition, skill training, and experience integration) to brand equity (such as patient loyalty and perceived quality)is not straightforward or direct. The realization of its value likely involves more complex mediating pathways or is subject to moderating influences. For example, new knowledge and technologies often need to be first converted into standardized clinical pathways, optimized service processes, or enhanced skills of medical staff (that is, effectively internalized via integrative capability) before they can be perceived by patients and indirectly affect brand equity.

Therefore, this non-significant result does not diminish the importance of learning capability. Instead, it uncovers the complexity of its influence pathways and poses a critical

question for future research: Through what specific mediating mechanisms, and under what boundary conditions, does learning capability ultimately contribute to brand equity? This insight offers a clear direction for constructing and testing more sophisticated theoretical models, such as mediation or moderated mediation models.

1.6.4 Contributions of methodological innovation

1.6.4.1 Simultaneous development and validation of paired scales for dynamic capabilities and brand equity

This study concurrently developed and validated two sets of measurement scales: one for the hospital dynamic capabilities and another for the brand equity.

This methodological innovation of the study makes it possible to test the causal relationship between the two within the same research framework, effectively avoiding threats to validity caused by factors such as time lags and sample heterogeneity during the data collection process.The developed scales retain the core theoretical constructs while fully incorporating the institutional characteristics and service attributes of public hospitals, thereby providing a reliable measurement foundation for subsequent research on the relationship between dynamic capabilities and brand equity.

1.6.4.2 Multi-level case study and triangulation

This study employed GD2 General Hospital as a single case, integrating departmental-level questionnaires on dynamic capabilities, patient-level questionnaires on brand equity, and qualitative data from archives and interviews. This approach enabled the aggregation and triangulation of multi-level data, achieving an integrated interpretation of data from different levels and providing a replicable research paradigm for systematically assessing dynamic capabilities and brand equity in public hospitals.

This research is pioneering in its systematic explanation of the “dynamic capabilities → brand equity” influence relationship and pathways within the context of a Chinese tertiary Grade A public hospital. Through differential testing of the sub-dimensions of dynamic capabilities, the study identified integrative capability as the core driver of brand equity, thereby further specifying the concrete manifestations of the “resource integration–value creation” chain within dynamic capabilities theory.

In summary, this chapter has systematically elaborated the theoretical contributions of the study across four levels: conceptual definition, scale development, empirical testing, and methodological innovation. It not only enriches the cross-examination of dynamic

capabilities and brand equity, but also provides solid academic support for Chinese public hospitals seeking to enhance their value in an increasingly competitive healthcare market.

1.6.5 Practical contributions

By constructing a theoretical model, explaining the mechanism of action, and developing evaluation tools, we provides hospital administrators with new theoretical perspectives, analytical methods, and pathways for improvement to systematically enhance brand equity and promote high-quality development in a dynamic environment.

First, this study offers a new framework based on the dynamic capabilities perspective to help hospital administrators understand and shape hospital brand equity. The study confirms the core relationship between dynamic capabilities and brand equity, and clarifies the crucial role played by integration capabilities in this process.

This “capability-equity” transmission model helps public hospital administrators change the traditional view of regarding brand building as primarily communication and promotion activities. Instead, it encourages them to systematically explore the sources of brand value enhancement by focusing on the foundation of organizational capabilities, such as optimizing internal operational processes and promoting cross-departmental resource collaboration.

The study identifies the differentiated pathways of action for the dynamic capabilities. To be specific, integration capability serves as the core driving force, sensing capability operates within specific boundaries, and learning capability may indirectly empower the other two by supporting them. It provides evidence-based priority guidance for strategic resource allocation of the hospital administrators.

Furthermore, the case study offers process mechanisms and concrete examples for reference to carry out industry management practices. Through empirical case analysis, this study systematically demonstrates how public hospitals transform external policies and technological opportunities into tangible service innovations and process reengineering through a closed-loop mechanism of “environmental perception—resource integration—strategic restructuring,” and ultimately become brand value recognized by patients.

In particular, the analysis of specific management scenarios, such as the operation of multidisciplinary team (MDT) models, emergency and crisis response procedures, and systematic popularization of health science, provides concrete process explanations and

universalized practical insights for hospital administrators to understand how dynamic capabilities are implemented in actual operations and transformed into brand advantages.

Finally, this study developed a standardized measurement tool system. The *Public Hospital Dynamic Capabilities and Brand Equity Measurement Scale* compiled independently by us in this study can serve as a management tool for hospitals to conduct self-assessment, benchmarking analysis, and continuous improvement. The administrators can use it to periodically evaluate the level of sensing, learning, and integration capabilities of the hospital, as well as the status of brand equity in terms of loyalty, perceived quality, association, and brand awareness.

The collaborative use of the two scales provides measurement tools and empirical foundation for examining the influence pathways between organizational dynamic capabilities and hospital brand equity. It facilitates a shift in hospital management practices from addressing fragmented surface-level issues to systematic strategic deployment focused on enhancing core competencies. It supports the evolution of hospital management toward an evidence-based, quantitative scientific decision-making model.

In summary, this study has established a comprehensive system supporting management practice at three levels: the theoretical level, the case study level, and the methodological level. The theoretical model not only demonstrates the correlation between hospital dynamic capabilities and hospital brand equity, but also reveals the specific pathways and underlying mechanisms through which dynamic capabilities promote brand equity. The case study presents how this mechanism is implemented in practice. The measurement tool provides hospital administrators with scientific evaluation methods and a basis for improvement. Together, they form a closed-loop management system encompassing capability building, value creation, and evaluation and optimization, and offer systematic theoretical foundations and practical guidance for Chinese public hospitals to balance their public service mission and competitive advantages in the pursuit of high-quality development.

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Chapter 2: Research Background

2.1 Policy context

In recent years, China has actively advanced the Healthy China Strategy and prioritized people's health in national development. The government has continuously improved the modern hospital management system and, for the first time, incorporated cultural development into the key content of hospital management (The General Office of the State Council, 2021).

The government has also formally articulated the objective of fostering a new culture for high-quality development, with the aim of establishing a patient-centered and quality-driven new culture to address the multifaceted challenges posed by the complex economic environment and resource allocation constraints. Enhancing operational governance, particularly the administration of intangible assets, has emerged as a critical approach to bolstering the core competitiveness of hospitals. Brand is one of the most valuable intangible assets held by a hospital, so the brand construction and management exert profound implications for elevating the hospital's social reputation and promoting its sustainable development (Li, 2024).

2.1.1 Implement the healthy China strategy

In 2016, General Secretary Xi Jinping put forward the strategic thought of prioritizing the development of universal health at the National Health Conference (Wang et al., 2021); in the same year, the Outline of the Healthy China 2030 Plan explicitly incorporated health into all policies; in 2017, Healthy China was elevated to a national strategy (Hua, 2017); in 2022, the 14th Five-Year Plan for National Health proposed deepening the reform of the medical and health system, centering on people's health, providing full-cycle and all-round health services, and continuously improving the people's health level (The General Office of the State Council, 2022).

2.1.2 Establish and improve the modern hospital management system

In 2009, the implementation of Opinions on Deepening the Reform of the Medical and

Health Care System marked the official launch of a new round of healthcare reform; in May 2015, the General Office of the State Council issued a document proposing to "accelerate the establishment and improvement of a modern hospital management system" (The General Office of the State Council, 2015).

In 2016, the 13th Five-Year Plan for Hygiene and Health proposed further advancing the reform of public hospitals and emphasized the significance of cultural development (The State Council, 2016); in 2017, the Guiding Opinions of the General Office of the State Council on Establishing a Modern Hospital Management System was issued, which explicitly stipulated that a modern hospital management system would be basically established by 2020 (The General Office of the State Council, 2017).

Subsequently, in 2021, the 14th Five-Year Plan re-emphasized strengthening the development of public hospitals and accelerating the establishment of a modern hospital management system (Xinhua News Agency, 2021); in 2022, the 14th Five-Year Plan for National Health further proposed promoting the high-quality development of public hospitals and improving the modern hospital management system (The General Office of the State Council, 2022).

The policy formulation of China's modern hospital management system has undergone evolution across multiple phases. The government has continuously adjusted and reformed policies to align with the demands of social development, advance the modernization of hospital governance, and elevate the level and quality of medical services (Wang, 2024). In this process, the "cultural development" has been incorporated into the modern hospital management system, which reflects its significance in hospital management and identifies it as one of the key drivers of the sustainable and high-quality development of hospitals (The General Office of the State Council, 2021).

2.1.3 Foster a new culture for the high-quality development of public hospitals

As noted earlier, in 2017, the Guiding Opinions of the General Office of the State Council on Establishing a Modern Hospital Management System first proposed incorporating "cultural development" into hospital charters (The General Office of the State Council, 2017).

In 2021, the Opinions of the General Office of the State Council on Promoting the High-quality Development of Public Hospitals explicitly proposed fostering a "new culture for the high-quality development of public hospitals," emphasized a patient-centered approach, strengthened health education and publicity efforts, continuously improved

medical services, and took the achievement of high-quality hospital development as its core objective (The General Office of the State Council, 2021). This process of cultural development constitutes a long-term and comprehensive reform initiative, which aims to enhance hospitals' social reputation and competitiveness so as to drive the sustainable development of the medical and health sector.

2.1.4 Strengthen the operational management of public hospitals

At present, due to extensive management and high cost consumption, the net returns from the revenue growth of public hospitals have been relatively declining. Relevant data indicate that a sharp drop in revenue and a substantial increase in expenditures have become prevalent challenges for hospitals, with the number of institutions operating at a deficit rising significantly. To maintain healthy and sustainable development, hospitals must strengthen operational governance, control costs, and improve efficiency (Gao, 2022).

Against this backdrop of the healthcare market, in December 2020, the National Health Commission, in conjunction with the State Administration of Traditional Chinese Medicine, jointly issued the Guiding Opinions on Strengthening the Operational Management of Public Hospitals. The document proposed advancing the high-quality development of public hospitals and enhancing the management of assets such as monetary funds, fixed assets, intangible assets, supplies and materials, and projects under construction. Notably, this marked the first time that intangible asset management was incorporated into the operational governance of hospitals (National Health Commission of the People's Republic of China & State Administration of Traditional Chinese Medicine, 2020). Brand equity represents a long-term competitive advantage and constitutes intangible assets with profound and enduring value (Lu, 2016).

2.2 Practical context

2.2.1 Attributes of public hospitals

Public hospitals refer to medical institutions funded and administered by the national or local government, whose primary purpose is to provide basic medical services and meet the public's health needs. Public hospitals are major recipients of expenditures within the national fiscal budget, and their funding sources rely primarily on government appropriations (Cai et al., 2023).

Public hospitals in China are typically categorized into three tiers: Tier-1 community hospitals (primary health service institutions), Tier-2 county/district-level hospitals (regional medical centers), and Tier-3 municipal hospitals (high-level general or specialized medical institutions), forming a three-tier diagnosis and treatment network covering both urban and rural areas (Zhiyan Consulting, 2015). These institutions not only fulfill their fundamental function of providing medical services but also shoulder social responsibilities such as public health services, disease prevention, and health education (Huajing Industry Research Institute, 2020).

In terms of attribute characteristics, the nature of public hospitals in China is multidimensional and composite, which is mainly reflected in the following aspects. First is their fundamental public welfare attribute. As a key carrier for the state to fulfill its health security responsibilities, the core mission of public hospitals in China is to ensure the equity and accessibility of basic medical services, with a distinct public welfare orientation. The 14th Five-Year Plan Outline explicitly stipulates that deepening healthcare reform must uphold the public welfare nature of the basic medical and health sector (Xinhua News Agency, 2021).

Huang et al. (2020) argued that with the in-depth implementation of the Healthy China Strategy, public hospitals, as an important force for safeguarding people's health, have seen their public welfare attributes become increasingly prominent. Public hospitals must adhere to a public welfare orientation, rationally control medical expenses, optimize medical service processes, and improve service quality and efficiency to meet the growing health needs of the general public. Guan et al. (2023) shifted the focus of public welfare to more dynamic public value creation; its connotation has been expanded to include basic, protective, innovative, and competitive public values, with an emphasis on its characteristics of dynamic transformation.

Second is its unique organizational attribute as a public service institution. As public service institutions established by the government, public hospitals are subject to administrative system constraints in terms of personnel management and resource allocation. The government ensures the operation of hospitals through budget appropriations, medical insurance prepayments, and other means (Li, 2021). Under the public service institution management model, on the one hand, traditional public service institution management mechanisms, such as staffing administration and promotion systems, pose certain challenges for hospitals in talent recruitment, training, and incentives, including issues such as talent

loss and high promotion pressure.

On the other hand, public hospitals also face pressure to shift from the traditional financial management model of public service institutions to a modern hospital financial management system. Public hospitals are required to carry out government-mandated tasks, such as hierarchical diagnosis and treatment and public health emergency responses, which reflect their administrative subordination as public service institutions. The design of salary systems must also align with the performance reform direction for public service institutions, balancing public welfare objectives with incentives for medical personnel (Ye & Zhang, 2021).

Third, public hospitals exhibit the dual attribute of integrating public welfare orientation with market mechanisms in their actual operation. This duality is reflected in the fact that they must not only fulfill their public welfare mission of ensuring basic medical services but also introduce market mechanisms in specific areas to improve operational efficiency. Qiao and Tang (2025) argued that the government should take the leading role in guaranteeing the equity of basic medical services provided by public hospitals (such as universal medical insurance coverage), while market mechanisms can be introduced into non-basic medical services (such as special-needs services and high-end medical care) to enhance service quality and efficiency through competition.

Finally, public hospitals also possess the attribute of social responsibility. The social responsibility attribute of public hospitals should be realized through a “four-in-one” framework: basic medical care (quality assurance), public health (emergency response), health promotion (science popularization and education), and regional coordination (resource sinking) (National Health Commission of the People's Republic of China, 2021). In addition to providing basic services, public hospitals are also required to undertake tasks such as technical assistance to primary-level institutions, and participation in emergency public health incident rescue, health education, and health promotion, so as to promote social equity and the harmonious development of public health (The Standing Committee of the National People's Congress, 2019).

2.2.2 Current development status of public hospitals

In recent years, with the deepening of healthcare system reform, the accelerated penetration of digital technology, and the structural upgrading of patient demands, public hospitals have been facing increasing competitive pressure, presenting unprecedented dynamics and

complexity. The competitive landscape has shifted from a single administrative market to a diversified and multi-dimensional dynamic competition system. How to ensure the dual improvement of economic and social benefits for public hospitals amid fierce market competition has become an important issue in public hospital management (Zhang, 2024).

In the course of development, public hospitals face a structural contradiction between their public welfare nature and the imbalance in financial compensation mechanisms. According to the Research Report on China's Public Hospital Market Competition Strategy Analysis and Investment Prospect (2025-2031), the DRG/DIP payment reform implemented after 2020 has resulted in 43.5% of tertiary public hospitals operating at a negative medical surplus, while government financial subsidies account for only 9.6% of hospitals' total revenue (Bosi Data Research Center, 2025).

The Annual Report on Shanghai Health Policy Research (2023), released in 2024, reveals that long-term government financial investment has been guided by "filling gaps" rather than "full coverage", which has put public hospitals in a dilemma between public welfare and sustainable operation (Shanghai Municipal Health Commission et al., 2024). The paradox of "public welfare objectives and profit-oriented survival" makes it difficult to eradicate the phenomenon of excessive medical treatment. Xu (2020) found that the over-reliance of government investment on medical insurance payments and individual out-of-pocket expenses has led hospitals to fill funding gaps through profit-seeking behaviors such as expanding inspections and increasing the use of high-value medical consumables.

At the same time, diversified competitors have intensified the differentiation of the medical market landscape. In 2023, the proportion of public hospitals dropped to 30.7%, while that of private hospitals reached 69.3%. The focus of competition has presented three-fold characteristics: technical stratification (tertiary hospitals focusing on high-precision and advanced equipment), service contextualization (a 62% annual increase in online consultation volume at private hospitals), and fierce talent competition (an 8.3% turnover rate of senior professionals with associate senior titles or above at public hospitals in 2024). This has led to a significant regional resource siphoning effect (the number of hospital beds per thousand population in eastern China is 7.5, exceeding that in western China by 50%) (National Health Commission of the People's Republic of China, 2024).

For example, private hospitals have established strong competitiveness in consumer healthcare sectors such as medical aesthetics and plastic surgery, assisted reproduction, and

stomatology, and are better able to meet the needs of attracting mid-to-high-end patients. Chain medical institutions represented by Aier Eye Hospital Group Co., Ltd. and Top Choice Medical Corporation have formed competitive advantages by attracting talents with high salaries and introducing high-end equipment (accounting for 83% of proton therapy devices among private hospitals), forcing public hospitals to shift toward high-yield services (Bosi Data Research Center, 2025).

In addition, technological innovation is profoundly restructuring the allocation model of medical resources. The application of technologies such as 5G and AI has driven the transformation of public hospitals from "resource-intensive" to "technology-driven" entities, and technological innovation is reshaping the resource allocation model of public hospitals. According to *the China Hospital Informatization Development Report (2024)*, the penetration rate of electronic medical record systems in tertiary hospitals in China has reached 98%, while the deployment rate of AI-assisted diagnosis systems in top-tier (Class 3A) hospitals exceeds 60% (Cao, 2025).

Furthermore, medical big data has become a strategic resource, with top Grade A tertiary hospitals collaborating with technology enterprises to develop exclusive AI models. The impact of internet healthcare has been far-reaching: in 2024, online diagnosis and treatment volume accounted for 6.2% of the total outpatient and emergency volume, with private institutions holding a 73% market share. Platforms such as We Doctor Group Limited and Ping An Health app have diverted 20% of chronic disease follow-up patients through the "online consultation + offline clinic" model (Zhiyan Consulting, 2020).

2.3 Research necessity

The analysis of the aforementioned policy context and practical context indicates that public hospitals are facing unprecedented pressure on environmental changes and development. However, the contradiction between policy requirements and practical challenges further highlights a core theoretical question: as not-for-profit organizations oriented toward public welfare, why do Chinese public hospitals need to focus on dynamic capabilities and brand equity? Whether these two theoretical concepts originating from the corporate context are applicable in China's public hospitals remains to be explored.

2.3.1 Hospital dynamic capabilities with a public welfare orientation

The dynamic capabilities theory originates from the field of corporate strategic management, and its core lies in explaining how firms achieve sustainable competitive advantage in rapidly changing environments through sensing, seizing, and reconfiguring (Teece et al., 1997). However, when applying this theoretical framework in public hospitals, the first challenge encountered is the difference in organizational objectives.

In the study on the transition of European public hospitals to value-based healthcare, Kokshagina (2021) highlighted that the shift toward value-based and digital healthcare requires hospitals to implement organizational transformation, balance internal competitive processes, and build new dynamic capabilities. The research further emphasized that public healthcare institutions pursue the development of dynamic capabilities precisely to transform rigid organizational structures and adapt to the demands of a constantly changing environment.

Min (2017) systematically demonstrated the applicability of dynamic capabilities theory in the context of public hospitals in Research on *Competitive Advantages and Capability Development of Medical Services in County-level Public General Hospitals from the Perspective of Dynamic Capabilities*. Through an in-depth analysis of the development of medical service capabilities in county-level public general hospitals, he constructed a conceptual model for the development of medical service capabilities, providing a theoretical framework for understanding how public hospitals can enhance their medical service through capability building.

With the reform of medical insurance payment methods and the deepening of the Diagnosis-Related Groups (DRG) system, public hospitals face an urgent need to transform from mere healthcare providers into service-oriented and value-driven organizations. According to Tian et al. (2022), relying solely on traditional resource allocation has become inadequate to adapt to the dynamic environment of medical reform. Hospitals must establish a dynamic capability model by developing sensing, learning, action, and coordination capabilities (such as the capability to sense medical reform policies) to maintain competitive advantages amid policy fluctuations.

2.3.2 Hospital brand equity with a public welfare orientation

The applicability of the brand equity theory to the public sector has also been questioned.

For a long time, “brand” has been regarded as a concept exclusive to the commercial sector, which is incompatible with the public welfare nature of public hospitals. However, recent research indicates that brand equity holds significant value in the public healthcare sector as well (Temporal, 2014).

Casanoves-Boix et al. (2025) found through a case study of Irish public hospitals that brand equity is a critical asset for all organizations, particularly public health institutions. Vantamay (2013) recommended to implement specific brand-building initiatives to maintain and enhance positive public perception.

According to a systematic literature review of Górska-Warsewicz’s (2023), a study involving patients in public and private hospitals in Indonesia found brand equity to be the primary variable for enhancing customer lifetime value in public hospitals. Brand equity is crucial in government departments because it enhances public credibility, trust, and loyalty toward the government, as well as foster empathy and understanding of patient needs.

Xing (2018) pointed out that the hospital brand, as the core of hospital culture, is embedded in both the material and spiritual aspects of the hospital’s environment and serves as a vital asset for the hospital’s sustainable development. In his analysis of brand-building in public hospitals, he emphasizes that such efforts help establish a positive image, generate added value, and foster patient loyalty and recognition. A strong hospital brand symbolizes high-quality medical services and serves as an indicator of reliability and social status.

The public welfare brand practices of Lianyungang Maternal and Child Health Hospital demonstrate that a meticulously cultivated and consistently maintained public welfare brand can serve as a powerful “engine” for hospital culture development, transforming abstract public welfare attributes into concrete actions and perceptible warmth (Zhou, 2025).

2.3.3 Theoretical basis for research on the relationship between dynamic capabilities and brand equity

Dynamic capabilities and brand equity stem from distinct theoretical traditions. The former is rooted in the resource-based view and evolutionary economics (Teece et al., 1997), focusing on an organization’s internal capacity to integrate, reconfigure, and renew resources; the latter originates from consumer behavior theory (Aaker, 1991), concerning the value perceptions and trust evaluations formed by organizations in the minds of patients and the general public. Integrating these two frameworks into a unified analytical model holds theoretical significance in establishing a “capability–value” transmission mechanism—as

Barney (1991) emphasized, sustainable competitive advantage arises from organizational capabilities that are difficult to imitate. Keller (1993) further noted that brand equity is essentially customers' externalized perception of organizational capabilities. Under this logic, dynamic capabilities constitute the endogenous foundation of brand equity, while brand equity serves as the external manifestation of the value of dynamic capabilities in the market.

Based on Keller's customer-based brand equity model, Lee (2021) investigated the impact of public perception of emergency medical services on the brand equity of the public health system. The findings indicate that the public's functional perceptions of emergency medical services significantly influence their cognitive understanding of the brand's significance within the public health system, thereby affecting the formation of brand equity.

Al-Amin et al. (2024) conducted an exploratory study on hospital dynamic capabilities, providing crucial support for understanding the "capability-value" transmission mechanism. Dynamic capabilities provide a systematic mechanism for hospital to identify opportunities for improvement, seize and utilize these opportunities, and optimize organizational operations through renewal and reconfiguration. Developing dynamic capabilities helps hospitals establish more systematic and effective approaches to organizational optimization. This accumulation of external perceptions driven by endogenous capabilities is also supported by Keller's (1993) framework on the formation of brand equity.

Chapter 3: Literature Review

The dynamic capabilities theory is an important framework for exploring enterprises' competitive advantages, emphasizing that enterprises respond to rapidly changing environments by integrating, building, and reconfiguring internal and external resources (Cyfert et al., 2021). First proposed in the United States in the early 1990s, this theory has continued to develop and been widely applied in the commercial field, and has also been introduced into the healthcare sector in recent years.

In medical institutions, dynamic capabilities are regarded as the ability of hospitals to adjust resources and processes in response to environmental changes, including environmental sensing, opportunity seizing, and upgrading and transformation. In China, scholars have classified dynamic capabilities from different dimensions, refining them into dimensions such as sensing and identification, coordination and integration, flexible management, innovation capability, and resource efficiency (Chen et al., 2024). This has formed a multi-dimensional model of dynamic capabilities for medical institutions, providing theoretical support and practical guidance for hospitals to maintain competitiveness in a dynamic environment.

Through an analysis of domestic and international literature, this thesis sorts out the research development context of hospital brand equity. Hospital brand equity is an important concept in hospital management, whose definition is mostly derived from brand equity theory and emphasizes a perspective centered on patients or consumers. It covers multiple dimensions, including brand loyalty, brand quality, brand association, brand awareness, and brand image, and these factors jointly determine the value of a hospital's brand (Górska-Warsewicz, 2022).

In China, hospital brands are regarded as a key component of hospitals' intangible assets, reflecting their unique image and service advantages. They not only affect patient satisfaction and loyalty but also are directly related to hospitals' organizational performance. As the competition in the medical market intensifies, a growing number of scholars have focused on the brand equity of public hospitals, arguing that it helps enhance hospitals' visibility and reputation, strengthen patient trust and loyalty, and thus promote their sustainable development (Li, 2024).

Chen (2017) argued that building their own brands and distinctive cultures will be the starting point for the dynamic capability construction of large public hospitals. The dynamic capabilities theory originates from the deepening of the resource-based view, and Teece (1997) defined it as a company's ability to flexibly integrate, build, and reconfigure internal and external resources to effectively respond to rapid environmental changes.

As a key component of intangible assets, the growth process of brand equity exhibits characteristics such as periodicity, competitiveness, dynamics, and nonlinearity, which are mainly reflected in the continuous evolution of the brand's position in the market. Dynamic capabilities and brand equity share similarities in attributes: both emphasize continuous adaptation and innovation in a changing environment to achieve long-term and stable development (Xiao et al., 2019).

With the deepening of research, more and more scholars have begun to explore the brand strategy, brand equity, and brand image of public hospitals from the perspective of dynamic capabilities. Teece (2018), the founder of dynamic capabilities theory, described dynamic capabilities and strategies on his official personal webpage: "Beyond the Next Big Thing: Stewardship of Intangible Assets through Dynamic Capabilities". Teece's profound insights into future research directions further highlight the theoretical value and practical significance of studies on the inherent relationship between dynamic capabilities and brand equity.

3.1 Dynamic capabilities theory

3.1.1 Resource-based view

The Resource-Based View (RBV) is one of the foundational theories in the field of strategic management, and its core ideas can be traced back to Penrose's (1959) exploration of the relationship between enterprise resources and growth. From the 1980s to the 1990s, scholars such as Wernerfelt (1984), Barney (1991), and Peteraf (1993) systematically constructed the theoretical framework of RBV, emphasizing that enterprises gain sustainable competitive advantages by controlling heterogeneous resources.

In the Theory of the Growth of the Firm, Penrose (1959) first proposed the logical chain of "resource-capability-growth", laying the ideological foundation of RBV. She pointed out that an enterprise is "a collection of productive resources", and its growth potential depends on how managers utilize underdeveloped "unused resources".

Wernerfelt (1984) published the research A Resource-Based View of the Firm in the Strategic Management Journal, explicitly defining “resources” as “any assets that can enhance an enterprise’s efficiency and effectiveness” for the first time, and advocating analyzing corporate strategies from a resource perspective rather than a product market perspective. He noted that resource barriers (such as patents and brand loyalty) can resist competitors’ imitation, thus forming “resource position barriers”. This research marked the transformation of RBV from ideological germination to theoretical construction.

Barney (1991) proposed the VRIO framework, defining four criteria for resource value: Value, Rarity, Inimitability, and Organization. Resources that meet these criteria can create sustainable competitive advantages for enterprises.

Peteraf (1993) integrated RBV in the Strategic Management Journal and put forward four conditions for competitive advantages: resource heterogeneity, ex post limits to competition, imperfect mobility, and ex ante limits to competition, further strengthening RBV’s emphasis on resource immobility and competition isolation mechanisms.

Dierickx and Cool (1989) proposed the distinction between “resource stocks” and “resource flows” in the Administrative Science Quarterly, emphasizing that strategic resources need to be formed through long-term accumulation (such as R&D investment and organizational culture cultivation) rather than being obtained immediately through market transactions.

Grant (1991) distinguished between “resources” and “capabilities” in the California Management Review: the former refers to the production factors owned by an enterprise (such as technology and equipment), while the latter refers to the processes of integrating resources to complete tasks (such as product development speed and supply chain coordination). He argued that capabilities are the mediating variables through which enterprises convert resources into competitive advantages. This hierarchical model provided a reference for the subsequent “core competence” theory.

With the deepening and expansion of academic research on the RBV, scholars have found that RBV only involves the identification of resources at a specific point in time and is a static analysis. Deficiencies such as neglect of environmental dynamism, lack of capability intermediation, and insufficient management initiative have gradually been exposed (Liu, 2018).

Teece (1997) proposed the dynamic capabilities theory in the Strategic Management Journal, arguing that enterprises need to continuously adjust their resource portfolios through

the "sensing-seizing-reconfiguring" cycle, with an emphasis on resource reallocation and environmental adaptability. This theory reconstructed the RBV paradigm through three dimensions. Eisenhardt and Martin (2000) pointed out that the manifestations of dynamic capabilities vary with market environments, including moderately dynamic markets and high-velocity dynamic markets. This classification reveals the complementarity between dynamic capabilities and RBV.

Research by scholars such as Lopes da Costa et al. (2024) also supports the above view. Empirical studies have verified the mediating role of dynamic capabilities based on resources, indicating that enterprises can convert existing resource advantages into lasting competitive advantages by enhancing dynamic capabilities such as organizational learning, innovation coordination, and strategic flexibility.

By defining resource heterogeneity, inimitability, and organizational adaptability, RBV has constructed an endogenous explanatory framework for enterprises' competitive advantages, emphasizing that such advantages stem from enterprises' unique resources and their allocation. From Penrose's dynamic resource view to Barney's VRIO model (Barney, 1991), the logical chain of "resources-capabilities-advantages" has been gradually improved.

Based on the VRIN (Valuable, Rare, Inimitable, Non-substitutable) characteristics of resources, the dynamic capabilities theory emphasizes the ability to rapidly reorganize resources and innovate products and services in a constantly changing external environment, as well as how enterprises update and reshape their own resources and capabilities to respond to market changes in a dynamic environment (Sun et al., 2024).

3.1.2 Definition of dynamic capabilities

Given that the RBV is a relatively "static" theory, it has certain limitations in explaining the dynamic development of enterprises' capabilities and resources (Khan & Lew, 2018). In the academic circle of enterprise management, research attention has gradually shifted to exploring the dynamic development process of enterprises from the perspective of dynamic capabilities. Against this backdrop, the dynamic capabilities theory has gradually emerged and evolved on the basis of the RBV (Yang et al., 2019).

The dynamic capabilities theory is a framework that emphasizes exploring the definition of enterprises and the sources of their competitive advantages from the perspective of dynamic capabilities, and it represents the development of the "capability theory of the firm" (Lu, 2013). This theory originated in the early 1990s in the United States, with its iconic

figure including Teece (Teece et al., 1997).

From the initial proposal of the concept of dynamic capabilities to the gradual construction and improvement of its theoretical system, it has undergone the passage of time and in-depth exploration by the academic community. During this process, scholars have continuously conducted in-depth analyses of dynamic capabilities' connotation, characteristics, and mechanism of action, as well as their impacts on corporate strategies and competitive advantages, and have gradually formed a relatively complete theoretical system (Cyfert et al., 2021).

The concept of dynamic capabilities can be traced back to 1990, when it was first put forward by three scholars, namely Teece, Pisano, and Shuen (Teece et al., 1990). They jointly elaborated on the core essence of dynamic capabilities as "the ability of enterprises to integrate internal resources, build new capabilities, and flexibly reconfigure internal and external resources to effectively respond to the challenges of rapid changes in the external environment".

Teece and Pisano (2003) further refined and enriched the theoretical system of dynamic capabilities, laying a more solid foundation for the development of this field. In 1997, they published an article titled Dynamic Capabilities and Strategic Management, which deeply analyzed how dynamic capabilities link an organization's internal resources with changes in the external environment and elevated them to a new height in the field of strategic management. This marks that dynamic capabilities have officially become an indispensable analytical framework in corporate strategic analysis and practice (Li et al., 2017).

The core proposition of the RBV is that if the resources held by an enterprise simultaneously exhibit the characteristics of Value, Rarity, Inimitability, and Non-substitutability (namely, resources that meet the VRIN criteria), they form a solid foundation for the enterprise's competitive advantage (Barney, 1991). It is essentially a static perspective (Barney, 2001a). The RBV does not delve into how to create new and future-valued resources in an evolving market environment, nor does it provide specific strategies for dynamically updating existing inventories of valuable, rare, inimitable, and non-substitutable resources.

In contrast, the dynamic capabilities theory was developed to address this gap. It focuses on how enterprises build, integrate, and reconfigure internal and external resources and capabilities to adapt to rapidly changing market demands and technological innovations. Thus, the dynamic capabilities theory is regarded as an important extension of the RBV

(Barney, 2001b). It emphasizes the critical importance of enterprises' ability to continuously innovate and flexibly respond to changes in a dynamic environment for sustaining competitive advantage.

Teece and Pisano (1997) defined dynamic capabilities as the ability to sense and seize new opportunities, as well as to reconfigure and protect knowledge assets, capabilities, and complementary assets to achieve sustained competitive advantage.

Regarding the concept of dynamic capabilities, the academic community has conducted extensive and in-depth research from two main perspectives. From the process operation perspective, Eisenhardt and Martin (2000) defined dynamic capabilities as clear and identifiable strategies or organizational processes that focus on how enterprises effectively utilize resources to adapt to and even lead market changes. They pointed out that these dynamic capabilities enable enterprises to reconfigure resources and make strategic decisions in contexts such as the emergence of new markets, inter-market interactions, market segmentation, market evolution, and market decline, so as to sensitively capture market opportunities and deeply perceive customer needs (Li et al., 2017).

O'Reilly and Tushman (2008) defined capabilities as an operational effectiveness that supports the smooth functioning of a wide range of technical practices and processes. This effectiveness ensures the continuity and efficiency of business operations and serves as a key driving force for the sustainable advancement of business. By enhancing such operational capabilities, enterprises can flexibly respond to diverse technical challenges, optimize internal processes, and thereby achieve stable operation and vigorous development of their businesses (Patrício et al., 2022).

From the capability type perspective, Collis (1994) proposed that dynamic capabilities consist of three categories. The first category refers to the capabilities that reflect an enterprise's execution of basic functional activities. The second category focuses on the continuous optimization and dynamic improvement of enterprise activities. These capabilities enable enterprises to flexibly respond to market changes and maintain competitiveness and adaptability in a competitive environment. The third category is closely linked to the second, with blurred boundaries. It is also related to dynamic improvement and its core characteristic lies in the ability to keenly identify and recognize the potential value of various resources, thereby seizing a favorable position in a dynamically changing environment.

Winter (2002) interpreted dynamic capabilities as a type of higher-order capability,

whose core value lies in continuously expanding, flexibly adjusting, and even completely reconstructing basic routine capabilities (namely, lower-order capabilities). This higher-order capability not only empowers enterprises to create and continuously update their unique resource portfolios but also profoundly influences the pace and rhythm of routine capability transformation, ensuring that enterprises maintain competitive advantages and adaptability in a rapidly changing market environment (Li et al., 2017).

Dynamic capabilities define how enterprises integrate, create, and reconfigure internal and external capabilities to address the challenges of a constantly changing business environment. Such capabilities are strengthened through organizational and management competencies, shaping the environment, and developing business models that handle new opportunities and threats (Tomé & Gromova, 2021).

They encompass an organization's comprehensive capabilities in knowledge acquisition, resource integration, capability renewal, resource reconfiguration, and innovation creation. This type of capability not only enables organizations to keenly capture and quickly respond to external market demands but also drives the continuous optimization and upgrading of internal operational processes and routines, ensuring that organizations maintain competitiveness and vitality in a dynamic environment (Patrício et al., 2021).

In addition, Zahra and George (2002) argued that dynamic capabilities are the ability to adapt to changes, allowing enterprises to timely replan and adjust their resource structures to ensure these resources can accurately align with and meet evolving customer needs. Meanwhile, they effectively respond to the dynamic adjustments of competitors' strategies, thereby maintaining a leading position in a highly competitive market environment.

Many other researchers have placed dynamic capabilities within a broader comparative framework. Winter defined "zero-level" capabilities, namely, basic capabilities, arguing that these capabilities ensure companies can smoothly perform daily operational tasks in the short term. He defined dynamic capabilities as a higher-order type of capability that focuses on enhancing, adjusting, or completely rebuilding those basic capabilities (Patrício et al., 2022).

Lopes Da Costa et al. (2024) advocated for a clear distinction between operational capabilities and dynamic capabilities. He pointed out that operational capabilities are often limited to addressing internal purely technical challenges and aim to drive significant changes in the short term; in contrast, dynamic capabilities stem from the need to adapt to external environmental and market challenges. Through a series of activities that emphasize

both continuity and transformation, they aim to continuously optimize and improve the company's current situation.

Despite differences in the expressions and focuses of the above definitions, we can still extract a common understanding regarding the construction of dynamic capabilities: these definitions collectively reveal that, as the most universal element in organizational processes, the core function of dynamic capabilities is to drive the transformation and reshaping of an enterprise's resource base (Ambrosini & Bowman, 2009).

Some scholars' research also shows us what dynamic capabilities are not. Winter (2003), Helfat (2007), as well as Schreyögg and Kliesch-Eberl (2007) emphasized that dynamic capabilities are not a single solution to a specific problem or an immediate unconscious response. They inherently contain identifiable patterns or elements, indicating that their operation processes are stable and replicable. In other words, dynamic capabilities can be repeatedly demonstrated.

Zollo and Winter (2002) argued that dynamic capabilities have the characteristic of persistence, and stressed that an organization cannot be regarded as effectively applying dynamic capabilities if it only responds to successive crises in a creative but incoherent manner. Zahra (2006) and Helfat (2007) pointed out that luck does not fall within the scope of dynamic capabilities; the application of dynamic capabilities stems from intentional and deliberate decision-making processes.

From the perspective of management practice exploration, many scholars have discussed dynamic capabilities from the viewpoint of enterprise management. Within the dynamic capabilities framework, management plays a crucial role, not only in strategic selection and implementation, but also in ensuring enterprises to maintain flexibility and competitiveness in a rapidly changing market environment through efficient coordination, thereby continuously driving the long-term prosperity of enterprises (Heubeck, 2024).

This ability to continuously transform organizational strategies depends on managers' capacity to quickly identify and effectively seize opportunities to reorganize the company's resource portfolio so as to mitigate future risks and uncertainties (Adner & Helfat, 2003; Heubeck, 2024; Teece, 2007).

Existing research on dynamic capabilities can be roughly divided into three categories. First, studies conducted from the perspective of the connotation and constituent dimensions of dynamic capabilities emphasize that the core function of dynamic capabilities is to adapt to a changing environment, and that organizational resources are the cornerstone supporting

dynamic capabilities (Zollo & Winter, 2002).

Second, research that carried out from the perspective of the formation mechanisms or influencing factors of dynamic capabilities holds that the evolutionary mechanism is one of the classic perspectives for understanding the generation of dynamic capabilities, and that the construction of dynamic capabilities is essentially a process of continuous evolution and accumulation of internal organizational knowledge (Zollo & Winter, 2002).

Some scholars have also explored the formation mechanism of dynamic capabilities from the perspective of diversified organizational factors, including organizational strategic orientation, learning orientation, and managerial traits, providing a more comprehensive view for understanding the construction of dynamic capabilities (Jiao et al., 2021; Zahra & George, 2002).

Third, research conducted from the perspective of the action paths and outcomes of dynamic capabilities focuses on exploring how dynamic capabilities act on organizational performance or the shaping of competitive advantages (Pundziene et al., 2022).

Through in-depth research, numerous scholars have established the position of dynamic capabilities as a solid cornerstone for improving organizational performance and building competitive advantages. This capability not only directly affects organizational performance and competitive advantages but also indirectly promotes the enhancement of both through various channels (Deng et al., 2023; Van de Wetering et al., 2021).

3.1.3 Definition of hospital dynamic capabilities

The dynamic capabilities theory is a theoretical achievement further evolved on the basis of the RBV and the core competence theory. It inherits the RBV's recognition of the importance of internal organizational resources and the core competence theory's emphasis on the cultivation of an organization's core competitiveness, while also introducing a dynamic perspective to explore the mechanisms and strategies through which organizations can maintain and enhance their competitive advantages by dynamically restructuring, integrating, and updating their resources and capabilities in a constantly changing environment (Deng et al., 2023).

Studies in recent years have shown that dynamic capabilities can help enterprises allocate new resources efficiently and ensure the effective utilization of internal resources. From the perspective of internal resource utilization, strategic approaches based on dynamic capabilities are grounded in the enterprise's RBV (Barney, 1991). Dynamic capabilities seem

to be particularly relevant to the public sector because they focus on internal resources (Castelo et al., 2023).

From the perspective of external resource utilization, in an uncertain market environment, by exerting dynamic capabilities, enterprises can effectively leverage both internal and external organizational resources in a dynamically changing environment to achieve continuous capability renewal and coherent development (Dong et al., 2011).

The dynamic capability framework facilitates public organizations in implementing strategies that rely on organizational processes or management, enabling organizations to continuously adapt to changes (Castelo et al., 2023). Thus, dynamic capabilities have also been described as "the ability of enterprises to integrate, build, and reconfigure internal and external capabilities to respond to rapidly changing environments" (Teece et al., 1997).

With the widespread adoption and deepening of the concept of dynamic capabilities in business practice and theoretical research, scholars worldwide have extended this theoretical framework originating from business management to the healthcare field, exploring its application potential in healthcare service delivery, institutional operation, and health management. This study sorts out the relevant formulations and research directions of foreign scholars on hospital dynamic capabilities (Yaya et al., 2025).

Some scholars have proposed that dynamic capabilities can serve as a tool for reconfiguring existing operational capabilities. For hospitals, their dynamic capabilities cover four dimensions, specifically including sensing capability, learning capability, Integrative Capability, and coordination capability (Miao et al., 2022).

Najmi et al. (2018) argued that the dynamic capabilities of hospitals refer to an organization's ability to flexibly respond to environmental changes, and timely adjust and optimize internal resource allocation and operational processes, so as to maintain and improve service efficiency and competitiveness. Gifford et al. (2022) held that hospital dynamic capabilities are the capabilities that hospitals need to possess in an external environment full of uncertainty and volatility, including the ability to keenly perceive environmental changes, accurately capture development opportunities, and efficiently implement upgrading and transformation strategies to maintain their flexibility and sustainable development.

From the perspective of health services, when discussing the quality of health services, Kerr and Trantow (1969) emphasized that the key to health service capability lies in responding to the public's health needs. In this process, medical services are required to keep

pace with environmental changes and ensure the timeliness and adaptability of healthcare services, which reflects the practical and theoretical significance of the dynamic capabilities theory in the field of health services.

Some scholars have interpreted hospital dynamic capabilities through empirical research. In a 10-year case study of a medical institution providing home health services, scholars Wang et al. (2018) proposed that dynamic capabilities consist of transactional-level capabilities and transformative-level capabilities.

The former refers to capabilities related to core organizational processes, with a focus on service delivery; the latter is independent of core organizational processes and focuses on developing an environment-adaptive organization at the strategic level. For example, through integrating remote patient management systems and related IT technologies, an organizational strategy for dynamic patient management can be realized, which encourages and empowers employees to try new solutions when encountering problems. These two types of capabilities reflect the traditional capabilities of environmental sensing and resource integration and reconstruction (Lu, 2020).

Given that hospitals are knowledge-intensive organizations, some studies have also interpreted hospital dynamic capabilities from the perspective of knowledge management and organizational learning (Salge & Vera, 2013). In their practice project, Yale New Haven Health System and Berkeley Research Group have conclusively verified through practical exploration that dynamic capabilities can serve as a strategic framework for hospitals, opening up an effective path for hospitals to seek and consolidate competitive advantages in an environment full of competition and uncertainty (Agwunobi & Osborne, 2016).

In addition, many studies have focused on the impact of dynamic capabilities on healthcare service outcomes and hospital performance, and there is a consensus that dynamic capabilities exert a positive driving effect. For example, research by Wu et al. (2022) found that dynamic capabilities among hospitals in the United States have a positive impact on healthcare service delivery performance.

Studies by Alhassani et al. (2022) have also confirmed a positive correlation between dynamic capabilities and hospital agility and performance. A number of studies have also investigated the role of dynamic capabilities in healthcare service innovation; for instance, the enhancement of dynamic capabilities yields positive effects in the application of health information interaction systems and Diagnosis-Related Groups (DRG).

Public hospitals in China have a clear public welfare attribute and unique connotations,

which means that the research on dynamic capabilities in enterprises cannot be simply applied to them. In 2003, Chinese scholars gradually introduced the dynamic capabilities theory into the field of hospital development research, opening a new chapter in the study of dynamic capabilities theory in hospital management (Diao et al., 2021).

Chen et al. (2017) defined dynamic capabilities as "the degree to which healthcare providers rationally apply theoretical knowledge and new technical skills, communicate effectively with patients, and continuously innovate to adapt to changes, and deliver high-quality and efficient medical services to meet health service needs. The dynamic capabilities of large public hospitals must be able to reflect their level of medical service provision and development potential."

At the same time, they defined the manifestations of dynamic capabilities, arguing that hospital dynamic capabilities should reflect the hospital's ability to timely acquire and rationally allocate medical resources and cultivate brand intangible assets; the ability to apply and promote clinical technologies to provide medical services and conduct translational medicine research for development and innovation; and the ability to continuously improve management decision-making, strategic planning, and risk monitoring. This study explicitly proposed that hospital dynamic capabilities are correlated with hospital brand equity, and that hospital brands, as important intangible assets of hospitals, are a key manifestation of hospital dynamic capabilities (Chen et al., 2017) .

Lu (2020) studied public hospitals from the perspective of public organization management and argued that the dynamic capabilities of public hospitals refer to the ability to perceive environmental changes and adjust (acquire, release, integrate, and reconstruct) resources to respond to such changes.

By comprehensively referring to the dynamic capabilities theory and existing literature, Deng et al. (2023) defined the dynamic capabilities of public hospitals as the sustainable development capability of public hospitals to timely perceive the challenges and opportunities brought by internal and external environmental changes, quickly acquire and absorb information and knowledge matching the environment, and then reconfigure and combine the hospital's existing resources to meet the public's health needs, adapt to the new industry ecology, and promote hospital resilience.

Combined with the definition proposed by Teece, the founder of dynamic capabilities theory, as well as relevant domestic and foreign research and factors such as the attributes, policies, and competitive environment of public hospitals in China, this study defines

hospital dynamic capabilities as follows: public hospitals can form the capability to support their sustainable development by timely perceiving environmental changes, quickly learning and acquiring information matching the environment, applying theoretical knowledge and technical skills, continuously adapting to changes, re-planning and integrating existing resources, and providing high-quality and efficient medical services to meet the public's health needs.

3.1.4 Dimensions and measurement model of hospital dynamic capabilities

To clarify the complexity of dynamic capabilities, guide corporate practice, advance theoretical research, and foster innovation in management, researchers have delineated these capabilities into constituent dimensions.

Teece et al. (2007) proposed coordination/integration, learning, and reconfiguration/adaptation as the core elements of dynamic capabilities. Among them, the coordination/integrative capability captures the systemic nature of the organization by requiring efficient coordination and seamless integration across processes. The learning capability highlights the organization's ongoing learning processes, characterizing learning as an iterative and experimental cycle that enhances both the speed and the quality of task performance. The reconfiguration/adaptation capability focuses on sensing when asset structures must be altered in a rapidly changing environment and on implementing the necessary internal and external transformations.

Teece (2007) divided dynamic capabilities into three dimensions. The first is sensing opportunities, which concerns an organization's ability to identify emerging opportunities and threats in its environment. The second is seizing opportunities, referring to the organization's capacity to make timely decisions and mobilize resources to capture value once such opportunities are recognized. The third dimension involves sustaining the organization's competitiveness by strengthening, combining, protecting, and — when necessary — reconfiguring both tangible and intangible assets. This is encapsulated as "Sensing, Seizing, and Realignment" (SSR). Together, these three dimensions constitute the classical "sensing, seizing, reconfiguring" framework of dynamic capabilities.

Although the terminology and ordering of dimensions differ across Teece's 1997 and 2007 works, they are complementary rather than contradictory. The 2007 framework placed greater emphasis on sensing, which in effect deepens the micro-level mechanisms underlying the reconfiguration/adaptation capability articulated in 1997. Conversely, the strong

emphasis on coordination/integration in the 1997 work is further elaborated and incorporated into the reconfiguration dimension discussed in 2007 (Lu, 2020).

With the continued development of dynamic capabilities research, Teece (2014) further refined the traditional SSR model by extending it into a threefold structure of "positions, processes, and paths", as illustrated in Figure 3.1.

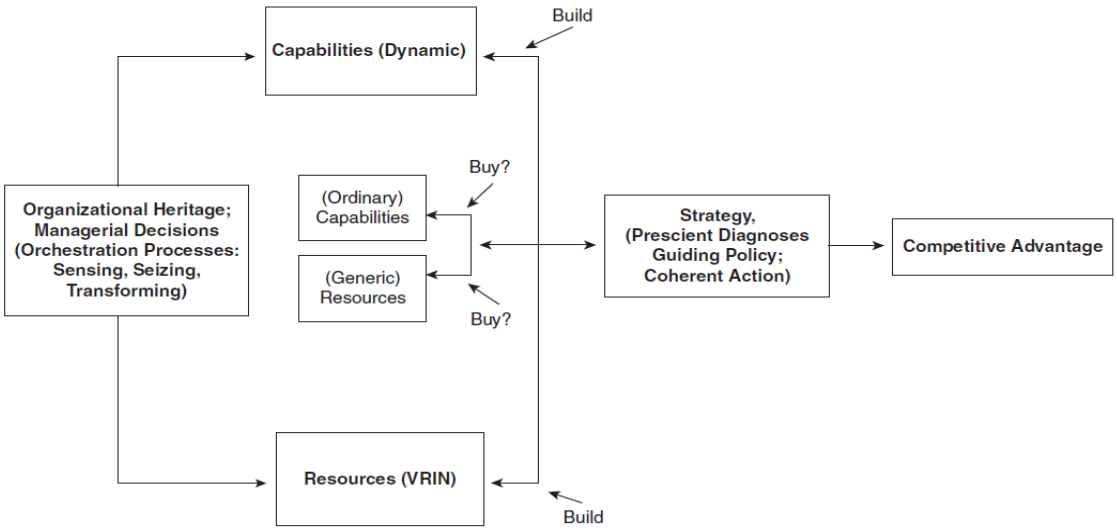


Figure 3.1 Dynamic capabilities structure diagram

Source: Teece (2014)

Teece's classification of dynamic capabilities is the most widely recognized. At the same time, numerous scholars have examined dynamic capabilities from a capability-based perspective. According to Zollo and Winter (2002), organizational learning constitutes a key source of dynamic capabilities, which are rooted in the gradual accumulation of tacit experience, the effective articulation of explicit knowledge, and the co-evolution of codified activities.

Wang and Ahmed (2007) further elaborate three core elements of dynamic capabilities: adaptability, absorptive capability, and innovation capability. Specifically, adaptability captures an organization's capacity for flexible adaptation to environmental changes; absorptive capability reflects its ability to acquire and integrate new external knowledge; and innovation capability is to develop novel products, services, or processes.

Eisenhardt and Martin (2000) decomposed dynamic capabilities into integrating, reconfiguring, acquiring, and releasing capabilities. Building on Teece et al. (1997), Bowman and Ambrosini (2003) further conceptualize four primary processes: (1) reconfiguration, (2) leveraging, (3) learning, and (4) creative integration.

Zahra et al. (2006) emphasized the critical role of top management in shaping sensing

capabilities and reinterpret absorptive capacity from a dynamic capabilities process perspective. They argued that absorptive capacity, as a dynamic capability, enables firms to create and exploit new knowledge, thereby enhancing their agility in ever-changing markets.

Additionally, Zahra et al. highlighted the reconfiguration of resources and processes by firms as a crucial dimension of dynamic capabilities, essential for maintaining their competitiveness and flexibility in uncertain environments. The greater the synergy among these three dimensions, the stronger a firm's dynamic capabilities and the higher its likelihood of generating a series of transient yet sustainable competitive advantages (Liu et al., 2010).

Many scholars have applied the theory of dynamic capabilities to the field of public management, defining its dimensions from managerial practice. Eisenhardt and Martin (2000) argued that deploying dynamic capabilities is a key strategy for organizations to navigate continuously changing environments and further distinguish between these capacities: one involves integrating and reconfiguring internal resources to enable flexible market responses; while another focuses on acquiring and releasing resources to ensure timely renewal and adjustment of organizational assets.

In addition, an organization's capacity to learn new practices or routines constitutes a central dimension of dynamic capabilities. This capacity is dynamic in nature, as it entails iterative cycles of resource integration and reconfiguration, through which experimentation and repetition are combined to facilitate ongoing performance enhancement.

As dynamic capabilities have attracted growing interest in hospital management, an increasing number of scholars have examined these capabilities in healthcare institutions. They have systematically explored their dimensions and dissected their various facets, aiming to provide robust theoretical and practical guidance for enhancing hospital management effectiveness and service quality.

Evans et al. (2017), for example, examined dynamic capabilities in terms of capability creation and the expansion or reconfiguration of organizational resources. Such capabilities are conceived as distinct competencies oriented toward change and innovation, shaping how organizations build, expand, or adjust their resource base through investment strategies and managerial interventions. These processes not only enhance adaptability in rapidly changing environments but also support sustained performance improvements and competitive advantage.

From a public organization perspective, Lu (2020) identified sensing, learning, and

integration/reconfiguration as the core dimensions of public hospitals' dynamic capabilities. Salge and Vera (2013) conceptualized incremental learning as a dynamic capability, structured around three organizational routines that facilitate problem identification, foster idea generation, and support engagement in change initiatives. Their survey of 153 UK hospitals reveals a significant positive relationship between incremental learning and risk-adjusted patient survival rates.

Pablo et al. (2007), in a case study of the Calgary Health Region in Canada, highlighted experimental learning as a dynamic capability instrumental in addressing reduced financial resources and increased demands for high-quality primary care services.

Additional studies have examined their role in developing health information exchange systems (Steward et al., 2012) and chest pain units (Piening, 2011), emphasizing how potential learning and decision-making facilitate both the comprehension and application of these capabilities (Evans et al., 2017).

In China, numerous studies have analyzed healthcare institutions' dynamic capabilities with reference to the current state of the country's healthcare sector.

Drawing on prior research on dynamic capabilities and performance evaluation indices for tertiary public hospitals, Diao et al. (2021) proposed a triangular model with three modules: investment, efficiency, and output. The model addresses quality of care, operational efficiency, sustainable development, and patient satisfaction, detailing the constituent elements and requisite resources to elucidate their interrelationships.

Zhang and Sun (2019) categorized public hospitals' dynamic capabilities into five dimensions—sensing, coordination and integration, learning, flexible management, and innovation capability—reflecting both the conceptual definition of dynamic capabilities and the distinctive characteristics of public hospitals.

Similarly, Chen et al. (2017) developed a dynamic capabilities model of large public hospitals by identifying three core elements—resources, basic ability, and development potential—and analyzing the investment-output structure of dynamic capabilities.

Also, analytical capability was employed to examine the relationship between capacity investments and outputs. It supports data envelopment analysis and the exploration of associations between hospitals' dynamic capabilities and healthcare resources, including hospital scale. Within this multidimensional model, large public hospitals need to consider intangible assets as part of capacity inputs and development potential as part of capacity outputs (see Figure 3.2).

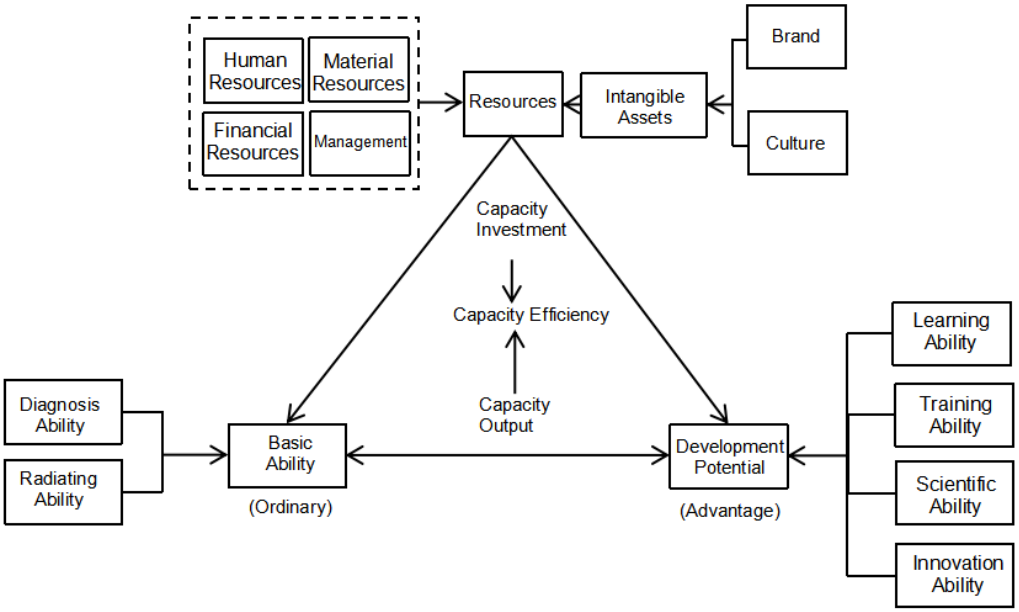


Figure 3.2 Dynamic capabilities model of large public hospitals

Source: Chen et al. (2017)

Grounded in Teece's definition (1997) and three dimensions of dynamic capabilities (2007), and consistent with the definition developed in this study, the dynamic capabilities of Chinese public hospitals are categorized into three dimensions: sensing, learning, and integration. A corresponding measurement system is thus established.

As the primary component of dynamic capabilities, sensing serves as the foundation and starting point for the research framework on public hospitals' dynamic capabilities. Both dynamic capabilities theory (Teece, 2007) and subsequent studies recognize sensing as the first step in the formation of dynamic capabilities.

Sensing capability in public hospitals refers to the capacity to provide a basis for informed decision-making by seizing opportunities and identifying threats. This capability is realized through monitoring environmental characteristics and changes, and through engaging in information exchange with stakeholders, which enables the prompt acquisition of development-relevant information. Specifically, it emphasizes the speed and effectiveness of detecting, disseminating, and utilizing external environmental information in rapidly changing contexts. Such effective sensing of environmental changes and recognition of necessary adjustments constitutes a critical foundation for public hospitals to secure sustained service advantages (Lu, 2020).

Moreover, public hospitals' sensing capabilities are intertwined with their external environment. Thus, hospitals must remain highly responsive to external changes stemming

from policy adjustments, shifts in public demand, and advancements in medical technology. By leveraging robust sensing capabilities, hospitals can promptly adapt to new conditions, optimize service processes, enhance medical quality, and finally realize sustainable development.

Based on prior scholarship, sensing capability in public hospitals refers to the ability to perceive emerging trends in internal resources and core competencies, alongside shifts in the external environment—including medical demand, patient experience, and policy requirements—and to adapt to these changes by responding rapidly, strengthening management and optimizing services.

Learning capability constitutes the second dimension of dynamic capabilities in public hospitals. Learning capability emerges from the co-evolution of tacit experience, explicit knowledge, and codified activities (Zollo & Winter, 2002).

Zahra and George (2002), from a process-view of dynamic capabilities, reinterpret absorptive capacity as a dynamic capability that enables organizations to create new knowledge, thereby enhancing their agility in responding to changing environments.

Moreover, organizations with strong absorptive capacity also demonstrate the ability to learn from peers, integrate external information, and embed it into organizational knowledge (Wang & Ahmed, 2007). Similarly, Verona and Ravasi (2003), based on studies across multiple industries, highlight that firms acquire external knowledge, assimilate it with their existing internal knowledge, and generate new knowledge, which together constitute a critical component of their dynamic capabilities.

Informed by these prior studies, learning capability in Chinese public hospitals refers to the organization-wide capacity, driven by key decision-makers, to continuously acquire, evaluate, integrate, and apply both internal and external medical, managerial, and experiential knowledge. This capability enables hospitals to enhance medical expertise, optimize service processes, improve managerial efficiency, and deliver higher-quality and more efficient patient care amid ongoing transformations in the healthcare system.

Integrative capability constitutes a pivotal dimension of dynamic capabilities, as enterprises must reconfigure their resources to respond to evolving conditions (Teece et al., 1997). Dynamic capabilities encompass the processes of integrating, reorganizing, acquiring, and releasing resources to adapt to or shape market dynamics (Eisenhardt & Martin, 2000). These processes enable organizations to rapidly redeploy resources, thereby creating competitive advantage (Zott, 2003). Dynamic capabilities represent a persistent

organizational orientation toward integrating, restructuring, renewing, and recreating resources and competencies, with the reconfiguration of resources and routines recognized as a central function (Wang & Ahmed, 2007; Zahra et al., 2006).

Integrative capability in Chinese public hospitals refers to the capacity, driven by key decision-makers and organizational efforts, to integrate and coordinate internal and external resources—including medical, human, technological, and informational assets—while optimizing their deployment across service processes, management systems, and institutional mechanisms. This capability supports the advancement of disciplinary development, operational efficiency, managerial performance, and healthcare quality, enabling hospitals to provide more efficient, continuous, and comprehensive care.

3.1.5 Differences between hospital and corporate dynamic capabilities

The dynamic capabilities theory originates from the field of corporate strategic management, with its core focus on explaining how firms can gain sustained competitive advantages in rapidly changing environments through sensing, seizing, and reconfiguring (Teece et al., 1997). As mentioned earlier, public hospitals in China are fundamentally characterized by their public welfare nature, while also possessing the attributes of public institutions, integration of public welfare orientation and market mechanisms, and the sense of social responsibility.Therefore, when applying the dynamic capabilities framework to the context of public hospitals, we must acknowledge the fundamental differences between the two in terms of organizational objectives, resource constraints, and governance structures.

First, there are differences in organizational objectives. The dynamic capabilities perspective integrates evolutionary logic with resource-based logic, focusing on those capabilities that can generate unique value for the organization through systematic transformation, thereby endowing them with competitive advantages (Zeng et al., 2017). These capabilities serve as the source of competitive advantage and performance improvement. As non-profit organizations guided by public welfare principles, public hospitals aim to build capabilities that help create public value and enhance patient health outcomes (Schilke, 2014).

Miller and Ghaffarzadegan (2025) further substantiated in their systematic literature review on dynamic capabilities in the public sector that the value of dynamic capabilities in the public sector is manifested in “enhancing public value by influencing operational capabilities, fostering innovation, and driving organizational change”. This finding indicates

that the effectiveness of hospital dynamic capabilities is reflected in improvements of social benefit indicators such as patient satisfaction, healthcare quality, and health accessibility.

Second, there are differences in resource constraints and governance structures. Enterprises primarily rely on market mechanisms to acquire resources, and the development of their dynamic capabilities allows for relatively free resource allocation to gain a competitive advantage. Public hospitals, however, face institutional constraints in resource allocation stemming from fiscal investment models, medical insurance payment policies, and staffing quotas.

In their study on dynamic capabilities of public healthcare institutions, Bogodistov and Beimborn (2026) proposed the profound metaphor of “flying with clipped wings”, noting that in highly regulated public organizations, “opportunity identification and strategic decision-making are often dominated by regulators, leaving hospitals with only the capability to reconfigure resources at the operational level”. Deng et al. (2023) further emphasize that applying the dynamic capabilities theory to public hospitals requires a re-examination of its definitions, constituent elements, and mechanisms of action, as its development must balance the dual objectives of public welfare and operational efficiency.

Finally, there are differences in operational models. Corporate operational models emphasize market competition and capital efficiency, and dynamic capabilities have long been viewed as a tool for gaining competitive advantage and profitability (Teece et al., 1997). Public hospitals, however, must operate within the frameworks of government regulation, health insurance policies, and public ethics. Their dynamic capability development must align with policy directives and public responsibilities (Qin et al., 2025).

For instance, public hospitals need to establish collaborative mechanisms with government healthcare security departments to ensure rapid response to healthcare payment system reforms and meet patients’ basic medical needs. This fundamentally differs from the market response mechanisms of enterprises (Tian et al., 2022).

In summary, there are fundamental differences between the dynamic capabilities of hospitals and those of enterprises in terms of organizational objectives, resource constraints, and operational models. The former is oriented toward public value, constrained by institutional frameworks, and subject to policy and ethical logic; while the latter is oriented toward competitive advantage, relies on market mechanisms, and pursues capital efficiency. Therefore, the theoretical framework of corporate dynamic capabilities cannot be simply

transplanted; instead, its connotations and dimensions must be redefined within the context of public hospitals.

3.1.6 Distinguishing between the objective and subjective attributes of hospital dynamic capabilities

Dynamic capabilities refer to an organization's higher-order capability to sense, integrate, and reconfigure resources to adapt to environmental changes (Teece et al., 1997). In the context of public hospitals, dynamic capabilities exhibit dual characteristics of objective and subjective attributes, which are both independent and interdependent, collectively constituting the dynamic capabilities as a whole.

The formation of the objective attributes of a hospital's dynamic capabilities relies on resource accumulation, institutional development, and technological investment, and is characterized by gradualism, measurability, and path dependence. The measurement tool for dynamic capabilities in public hospitals developed by Deng et al. (2025) transforms dimensions such as sensing and identification, as well as coordination and integration, into quantifiable items, which essentially represents operational measurement of objective attributes.

Chen et al. (2024) confirmed that objective practices such as resource reorganization and process optimization directly reflect the functioning of dynamic capabilities, which can be validated through operational indicators such as average length of stay, patient satisfaction, and bed turnover rate. Van Beers et al. (2026) further pointed out that objective practices such as lean processes and resource reallocation in hospitals can be quantitatively assessed through operational efficiency data (such as duration of treatment and cost control).

The subjective attributes of hospital dynamic capabilities, centered on organizational cognition, mental models, and value consensus, constitute the "spiritual core" that profoundly influences capability orientation and effectiveness. These attributes develop through cultural cultivation, cognitive upgrading, and team consensus, and they possess implicit, situational, and proactive qualities (Zhang & Sun, 2019).

An empirical study on the dynamic capabilities of healthcare organizations indicates that, in addition to observable processes, there exist "hidden capabilities" within organizations. These capabilities only emerge when resource management faces difficulties, and are closely related to the organization's knowledge base and problem-solving mental models (Loureiro et al., 2023).

Fang et al. (2025) argues that the developmental challenges of dynamic capabilities in infectious disease hospitals stem in part from deficiencies in subjective attributes, such as a slow response to external changes, weak interdepartmental collaboration, and a lack of emergency culture. It is evident that subjective attributes determine whether a hospital can promptly and accurately "sense" objective signals, as well as the "mindset" and "consensus" with which it "integrates" and "reconfigures" resources.

In summary, the objective and subjective attributes of a hospital's dynamic capabilities are interdependent, mutually transformable, and co-evolve in a synergistic manner. Objective attributes serve as the vehicle and external manifestation of subjective attributes, while subjective attributes constitute the core and driving force of objective attributes. Hospitals that successfully address uncertainty must possess both the objective capability for resource reorganization and the subjective cognition for rapid learning. The synergy between objective and subjective attributes is the core of organizational resilience (Gifford et al., 2021).

The research team of Wang and Guan (2026) proposed the "Integrated Strategic Domain Model" and "dynamic capability" cultivation in their discussion of high-quality development of public hospitals, which requires hospital administrators to become "systematic thinkers" who balance and coordinate resources across different strategic domains such as clinical leadership and technological innovation. It is evident, therefore, that the dynamic capabilities of public hospitals exhibit intrinsic unity in both subjective and objective attributes.

3.2 Brand equity theory

3.2.1 Definition of brand

The origin of brands can be traced back to the nomadic tribes in Spain, where livestock were marked to indicate ownership and distinguish them in barter exchanges. The English word "brand" still carries the meaning of a mark or identifier to this day (Aaker, 1991).

In the 13th century, European brands emerged. Merchants and artisans in trades such as jewelry, weaving, and leather working formed guilds, which required members to apply specific marks to their products. Craftsmen and traders were also required to affix personal marks. These practices aimed to monitor product quality, uphold the guilds' monopolies, and penalize inferior manufacturing and counterfeiting (Li et al., 2007).

In the 14th century, legislation was enacted in Europe, stipulating that those who forged

wine labels would be hanged. By the 16th and 17th centuries, guilds had become the pillar of Europe's economy, and guild marks, liability marks, and personal marks were widely used. They helped producers boost commodity sales and saved consumers' time and effort. Brands gradually evolved into a means of market competition (Li et al., 2007).

Modern brands came into being with the rise of capitalism in the 19th century. With the development of the economy, production and trade, there was a growing need for universal marks to identify commodities, which led to the popularity of brands. Unlike earlier marks, modern brands are not only identifiers, but also transferable industrial property rights and legally protected intangible assets (Li et al., 2007).

Since the mid-19th century, Western European countries have begun to afford legal protection to brands. Academic research on brand-related competitive benefits brought by brands started in 1955 (Sáiz & Castro, 2022). Since then, research on brand-related competitive benefits has grown substantially, mainly covering the following areas: the nature of branding, consumers' brand choices, brand establishment and management, and brand equity (Li et al., 2007).

As the concept of branding evolved, scholars such as Keller have pointed out that a brand essentially represents a seller's consistent commitment to the product characteristics, benefits, and services delivered to buyers (Kofler, 2010). Guaranteed quality constitutes an optimal brand.

The essence of branding lies in an implicit contract between an enterprise and its customers. On one side, the enterprise offers a commitment—typically regarding product or service quality—while on the other, customers reciprocates through what is termed a "brand premium." The mutual exchange, based on trust and recognition, achieves a balance in market transactions (Li et al., 2007; Meng, 2024).

Keller has classified brand definitions from a restricted view (termed a "small" band) and an expansive view (termed a "big" band). The definition put forward by the American Marketing Association is the restricted conception. In contrast, the expansive conception refers to the sum of brand awareness and brand associations established by the tangible elements of a brand in customers' minds, as well as the resulting customer perceptions, evaluations, and purchase behaviors toward its products (Wang, 2014).

Aaker holds that corporate brands are closely related to corporate competitiveness and has elaborated on the relationship between the two. He pointed out that in a fiercely competitive market environment, an enterprise's brand competitiveness is what enables it to

stand out from the competition. Brand competitiveness is gradually formed through continuous accumulation and integration of various professional skills and strategies in the field of brand management during long-term brand management practices. The competitiveness is reflected not only in an enterprise's ability to successfully build strong brands with distinct characteristics and high recognition, but also in its capacity to continuously inject vitality into these brands and ensure their sustainable development in the market (Aaker & Joachimsthaler, 2000).

In China, brand research has gone through a long phase of learning and imitation. Yu (2008) argued that the brand research in China can be divided into three stages: (1) the input and dependence stage (1980s); (2) the theoretical exploration stage (1990s); (3) the innovation stage integrating practice and interdisciplinary advantages (late 1990s to the present). Zhang (2013) held that the development course of China's brand theory (1998—2012) can be divided into three periods: the learning and introduction period before 2001, the digestion and absorption period from 2002 to 2006, and the imitation and innovation period after 2007.

In China, the brand research has experienced a long learning phase. Li (2016) proposed that China's brand research from 2000 to 2015 can be divided into three stages: the exploration period from 2000 to 2004, the growth period from 2005 to 2008, and the maturity period from 2009 to 2015.

Lin and Han (2021) believed that Chinese enterprises' cognition of brands has roughly gone through three stages: regarding brands as products, regarding brands as communication tools for communication, and regarding brands as strategic equity. Jiang (2023) suggested that China's brand research can be divided into the embryonic stage from 2002 to 2007, the growth stage from 2008 to 2011, and the maturity stage from 2012 to 2022.

From the perspective of research themes, studies of Chinese brands have mainly focused on the micro and operational perspectives: "Brands as viewed through the lens of the firm, brands examined in terms of their intrinsic attributes, and brands analyzed from the standpoint of consumers" (Zhang & Huang, 2019).

3.2.2 Definition of the hospital brand

In China, scholars such as Zhu (2006) were among the early researchers to analyze the concept of hospital brands. They pointed out that hospital brands convey information about a hospital's unique personality, functional advantages, core values, and service quality through

means such as textual descriptions, symbolic signs, and distinctive marks, enabling the hospital to stand out and be easily identifiable. A hospital brand is not only a concentrated reflection of patients' value recognition and choice of a specific hospital, medical specialty, or renowned physician, but also carries a commitment to the quality of medical services and professional trust, with prominent characteristics such as exclusivity, exclusiveness, and sustainability.

Zhu (2020) provided a more explicit definition of hospital brands, characterizing it as a service standard, commitment, and quality grounded in medical expertise, service quality, and organizational culture. It is gradually formed in long-term practices such as medical services, teaching, and scientific research. It is also the sum of society's value orientation toward the hospital, a reflection of the hospital's social effects, and further a transmission of the hospital's overall cultural and value philosophy.

With the development of the modern medical system, the connotation of hospital brands has grown increasingly richer. Wang (2012) argued that a hospital brand refers to the influence, visibility, trust, reputation, and loyalty among the public of the tangible and intangible assets owned by a hospital (including the quantity and quality of technical expertise, medical quality, competence of talent teams, service quality, management level, cultural heritage, medical equipment, and infrastructure).

Wang (2018) emphasized the importance of hospital brands, pointing out that they are not only a key reference for patients to identify hospitals and the products and services they provide, but also systematically outlined six core dimensions for building hospital brands, including discipline brands, technology brands, service brands, talent brands, cultural brands, and public welfare brands.

Chen et al. (2022) indicated that a hospital brand is the service commitment and product characteristics formed by the hospital in long-term operational or public welfare activities such as medical services, teaching, and scientific research provided for the public, and it is the sum of society's and patients' value orientations toward the hospital. They believed that a complete hospital brand should include technology brands, service brands, cultural brands, and image brands.

Researchers have widely acknowledged the pivotal role of hospital branding in building a hospital's overall competitiveness.

Zhuang (2007) argued that a brand embodies the core value of a hospital, serves as a discriminator for identifying hospital services, and is a guarantee of quality and credibility.

As its core, a hospital brand is defined by medical quality, supported by humanistic services and based on hospital culture. Its foundation rests on sound hospital management, and its vitality stems from continuous innovation.

When building their brands, public hospitals should focus on four core elements: professional competitiveness, market adaptability and innovation capability, public credibility formed by good market reputation, and the humanistic quality of employees. Implementing a brand strategy relies on integrity as the foundation, high-quality medical service, and emotional brand recognition (Zhuang & Huang et al., 2007).

Sha (2008) held that once successfully established, a hospital brand has strong potential to attract social resources. Such brand appeal can help hospitals gather and integrate social resources from various parties, thereby accelerating the formation and development of their core competitiveness.

Wang (2018) maintained that hospital brands not only serve as a solid foundation for the survival and development of hospitals but also play a crucial role in shaping a positive hospital image, enhancing comprehensive competitiveness, and promoting the healthy, sustainable, and stable development of hospitals.

Yin et al. (2020) pointed out that effective communication can help showcase the quality, technology, and services embodied in a hospital brand, achieve effective connection between the brand and target groups, and develop brand culture in the process of exploring public needs and gaining public recognition, thereby enhancing the hospital's sustainable competitiveness.

Shi (2021) argued that a hospital brand, which signals the hospital's technical strength and service quality, plays a vital role in fostering a positive hospital image, strengthening comprehensive competitiveness, and propelling public hospitals towards high-quality development.

In summary, it is evident that public hospitals in China have entered the era of brand management. There is a widespread consensus in the industry that only by strengthening brand building and effectively implementing brand management strategies can hospitals consolidate and enhance their core competitiveness and thus stand out in the fierce market competition. As a branch of brands, hospital brands are distinct from commercial brands, especially public hospital brands. A hospital brand represents both the service commitment to the public and distinctive characteristics developed through the hospital's long-term operational or public welfare activities such as medical services, teaching, and scientific

research. And it is also the collective reflection of public values toward the hospital (Liu, 2023).

3.2.3 Definition of the brand equity

The brand equity is an important new concept that emerged in the field of marketing research and practice in the 1980s. In 1988, the Marketing Science Institute (MSI) established brand science with the "brand equity" as its core, thereby opening the door to modern brand theory (Keller, 2009a).

Aaker (1991) is hailed as "the father of brand equity research". In 1991, he published his masterpiece Managing Brand Equity: Capitalizing on the Value of a Brand Name, which systematically elaborated on the concept of brand equity for the first time and laid a solid theoretical foundation for the evaluation and management of brand value.

Aaker (1991) argued that a brand is not merely an identifier; it represents an extremely valuable intangible asset that is legitimate and of enormous value. A brand can profoundly influence consumers' decisions and behaviors and can bring sustained and stable future income to brand owners. The various benefits and advantages directly or indirectly generated by a brand are collectively referred to as the brand equity. In short, the brand equity reflects the comprehensive value created by a brand for the company and its customer groups. This value is rooted in consumers' profound cognition, positive attitudes, and rich associations toward the brand, as well as their past interactive experiences with the brand.

In September 2014, Aaker released Brand Relevance: Making Competitors Irrelevant, further enriching the theoretical system of brand management. In this work, Aaker (2014) emphasized that the emergence of the brand equity concept is a milestone in the development of marketing. Before the brand equity concept was formally proposed, the focus of marketing was often limited to well-planned advertising budgets and expenditure plans. The introduction of this concept completely subverted traditional thinking.

Since then, the brand management has no longer been regarded merely as a tactical tool or a strategic-level consideration. Instead, it has been elevated to the level of corporate strategy, attracting substantial attention from top managers. The brand equity has become an indispensable part of corporate strategic planning, driving enterprises to stand out in fierce market competition and thus achieve sustainable development (Aaker, 2014).

Kapferer published The New Strategic Brand Management in 1992. In this book, Kapferer (1992) elaborated on the concept of brand equity in depth, defining it as an

additional value that a brand name endows to a product or service. This value not only transcends the functional characteristics of the product itself but also encompasses the additional benefits perceived by consumers. He further pointed out that the brand equity constitutes the brand capital, which is reflected not only in the economic value created for enterprises but also in its profound impact on end consumers' cognition and value perception of the brand. Through this work, Kapferer clearly demonstrated his profound insights and unique perspectives on the brand management from an enterprise perspective.

Keller is widely recognized as one of the pioneers in the comprehensive research of international marketing communication and strategic brand management. In 1998, he published his work Strategic Brand Management, which systematically expounded on the concept of brand equity for the first time (Keller, 1998).

In his 2003 work and later studies, Keller (2003) further emphasized that brand equity is extends beyond the added value derived from the functional benefits of products or services; it resides in the unique market influence and added value inherent to the brand itself.

He clearly pointed out that the brand equity is the key factor explaining why products or services with brand identifiers can stand out in market competition and achieve marketing results that are significantly differentiated from unbranded products (Keller, 2014). He proposed that brand equity has two core components: brand awareness and brand image. Specifically, the brand awareness measures the depth of consumers' cognition and understanding of a brand; the brand image refers to the specific impressions and associations that consumers form of a brand in their minds.

Notably, Keller (1993) pioneered the introduction of the Customer-Based Brand Equity (CBBE) theory. This theory fundamentally revolutionized the understanding of branding by centering it on the customer's perspective, thereby reshaping and deepening the conceptual and theoretical framework of brands and equipping brand management with new perspectives and tools.

In summary, scholars have defined the brand equity mainly from three perspectives: the financial perspective, the market perspective, and the user perspective. From the financial perspective, scholars' definitions of the brand equity exhibit diversity. On the one hand, some scholars have defined the brand equity as the sum of current earnings and the discounted value of projected future earnings (Brasco, 1988), or as the acquisition value and liquidation value related to the brand (Stobert, 1989), or as the acquisition and liquidation value (Brasco, 1988; Stobert, 1989).

On the other hand, some scholars have proposed that the brand equity should be regarded as the incremental discounted value of a company's future cash flows realized due to the existence of the brand; that is, it is evaluated by comparing the differences in future cash flows of the same product under different brand conditions (Simon & Sullivan, 1993). These different definitions reflect scholars' multi-dimensional understanding and evaluation methods of the financial value of brand equity.

From the market perspective, definitions of the brand equity also show diversity. Notably, Aaker (1991) put forward an interpretation in 1991, arguing that a brand is composed of a series of brand assets and liabilities closely associated with the brand name and symbolic signs. These assets and liabilities can enhance or weaken the overall value perception of specific products or services for the enterprise itself and its target customer groups (He, 2016).

Kenton (2022) argued that a brand is an intangible marketing or business concept that helps people identify a company, product, or individual. Jahan et al. (2024) hold that a brand refers to endowing a product or service with unique attributes that distinguish it to some extent from other offerings designed to meet the same needs.

From the customer perspective, Keller (1993) defined a brand as a consumer's differential response to marketing activities, driven by their existing knowledge about the band. This is arguably the most influential definition from the customer-centric viewpoint.

Blackston (1995) proposed that the brand equity consists of two core components: brand meaning and brand value. The brand meaning includes the brand saliency (that is, the degree of prominence of a brand in consumers' minds), brand associations (that is, a series of thoughts, feelings, and experiences linked to the brand), and brand personality (that is, the unique traits and characteristics exhibited by the brand). He argued that the process of brand equity accumulation is essentially the deepening of interactive communication between the brand and consumers, and this process can be vividly described as the gradual construction of brand relationships (Blackston, 1992).

Leuthesser et al. (1995) contend that a brand name independently and significantly enhances the perceived value of a product or service. Lassar et al. (1995) defined the brand equity from five dimensions: first, consumers' subjective perceptions; second, the comprehensive value embodied by the brand; third, brand value is rooted not only in the intangible dimension of the brand name but also transcends mere product features; fourth, it must possess unique advantages over competitors; and finally, these advantages can

positively impact a company's financial performance and drive revenue growth.

Despite differences in research perspectives, researchers have reached a widely accepted consensus on the definition of brand equity: the brand equity refers to the better effects or outcomes that branded products can achieve in marketing activities compared with unbranded products of the same category (Aaker, 1991; Dubin, 1998; Farquhar, 1989; Keller, 2003). This specific effect can be considered from the consumer level, reflected in the improvement of subjective constructs such as attitudes, awareness, brand image, and cognition; from the enterprise level, it is reflected in objective outcomes such as price advantages, growth in market share, increase in revenue, and improvement in cash flow (Keller, 1993).

The concept of brand equity defined by the MSI in 1988 demonstrated a high degree of comprehensiveness and extensiveness, covering association systems and behaviors of the brand among stakeholders such as customers, channel members, and parent companies (Leuthesser, 1988).

This not only enables brands to achieve significant growth in sales and marginal profits without direct reliance on brand names, but also endows brands with strong, lasting, and distinctly differentiated competitive advantages over competitors. In short, MSI's definition of brand equity profoundly reveals the multi-dimensional composition of brand value and its far-reaching impact on market performance and competitiveness (He, 2016).

3.2.4 Definition of the hospital brand equity

The hospital brand equity is an important component of a hospital's core competitiveness (Li, 2024).

Internationally, definitions of the hospital brand equity are basically derived from Aaker (1991) or Keller (2003). The core definition of brand equity emphasizes a consumer-or patient-centered approach. The differences lie in how to identify the medical behavior-related factors that affect and shape the value of this asset, as well as in clarifying the importance of these factors in the overall evaluation (Warsewicz, 2022).

The empirical research by Krishnan and Hartline (2001) also showed that consumers' perception of the brand equity value is not affected by their knowledge about specific product categories. Therefore, the theory of consumer goods brand equity has universal significance and can be fully applied to research on service (medical care is a specialized service) brand equity (Li, 2009).

Kim (2008) argued that the hospital brand equity is an important concept in the medical industry, which profoundly affects patients' loyalty, satisfaction, and referral decisions. His research highlights the significant role of high-quality hospital brands in promoting patients' behavioral patterns and institutional operational effectiveness. Specifically, brand loyalty, patients' perception of service quality, brand-induced associations, the strength of brand awareness, and the overall shaping of brand image all constitute indispensable key elements for defining the hospital brand equity.

In recent years, research in China has also been carried out to explore the integration of brand concepts into hospital management systems. Wang (2006) argued that a hospital brand refers to the unique and sustainable competitive, developmental, and service advantages that a hospital and its service products demonstrate compared with competitors. It includes elements such as hospital philosophy, visual identity, service standards, quality, expert teams, and environmental facilities, which together constitute its distinct identity.

Liang (2013) classified hospital assets into tangible and intangible categories based on their forms. Tangible assets include current assets and fixed assets. Intangible assets refer to assets that have no physical forms but can endow hospitals with specific rights and interests, including property rights such as brands, patents, copyrights, land use rights, non-patented technologies, goodwill, and software purchased by hospitals that are not necessary hardware components.

Liu (2021) believed that public hospital brands constitute a type of intangible asset, whose origin lies in the differentiated feedback of patients on medical experiences in different hospitals. This difference is rooted in patients' brand awareness, including their thoughts, emotions, impressions, personal experiences, and deep-seated beliefs about hospital brands. He also pointed out that a hospital's brand, though rooted in tangible reality, ultimately reflects the healthcare experiences and habits of patients and society, residing in the minds of patients and the public.

Against the growing emphasis on hospital operations and management, the value and importance of brands have become increasingly prominent, emerging as a key component that cannot be ignored. Some scholars have also pointed out that among the brand equity of non-profit organizations, brand personality, brand image, and brand awareness, exert a direct positive impact on individuals' willingness to donate. In building the brand of a public welfare organization, the nature of its charitable initiatives must be taken into account (Yu & Zhao, 2003).

In building brand equity, public-welfare organizations emphasize not only conventional factors but also their public-benefit nature, organizational purpose, mission, and future vision. Such a brand is realized by upholding the original aspiration of public welfare, continuously expanding the boundaries of public welfare services, and gaining extensive social recognition and support. The influence of such brands is demonstrated through social visibility, public trust, public participation, and the good reputation of public welfare products (Herzlinger, 2000).

Based on previous studies and combined with the unique attributes of public hospitals in China, this study defines the brand equity of public hospitals as an intangible asset accumulated through differentiated identification and continuous value creation in the delivery of medical and health services, composed of elements such as medical technology, service quality, management efficiency, patient trust, and social responsibility. It represents the cognitive and emotional connections formed by patients and the public based on these elements, as well as the evaluations made by government authorities.

3.2.5 Dimensions and measurement model of hospital brand equity

In 1988, the Marketing Science Institute (MSI) in the United States designated brand equity as a priority research topic at a conference, marking the formal introduction of the concept into the field of marketing management. Since then, brand equity has rapidly emerged as one of the most influential and influential core concepts in the discipline. Over time, it has not only solidified its position as a central concept in marketing theory but has also profoundly shaped the development of related theoretical frameworks, serving as a key foundation for guiding marketing strategies and practices (Ailawadi et al., 2003).

Within the academic field of brand management, numerous scholars have elaborated on the concept of brand equity while simultaneously developing theoretical frameworks for its measurement, providing tools for a deeper understanding and evaluation of brand value. The concept of a brand equity model was first formally proposed by Srivastava and Shocker in their 1991 thesis *Brand Equity: A Perspective on Its Meaning and Measurement* published in the *Journal of Marketing* (Srivastava & Shocker, 1991).

Since then, the field has experienced rapid growth, with notable contributions from scholars such as Aaker, Keller, and Kapferer, who have all played significant roles in refining and expanding brand equity models (Srivastava & Shocker, 1991).

Based on prior research by both international and Chinese scholars, this study focuses on five core theoretical models that have been pivotal in advancing brand equity measurement research, thereby presenting the basic trajectory of theoretical development in the field.

The theoretical measurement of brand equity began in the early 1990s. Srivastava and Shocker (1991) first proposed a Three-Dimensional Model encompassing brand loyalty, brand awareness, and perceived quality, laying the foundation for subsequent research.

Drawing upon this, Aaker (1991) made a seminal extension by introducing the widely recognized “Five-Star” Brand Equity Model, which deconstructs brand equity into brand loyalty, brand awareness, perceived quality, brand associations, and other proprietary assets (Srivastava & Shocker, 1991) (Figure 3.3).

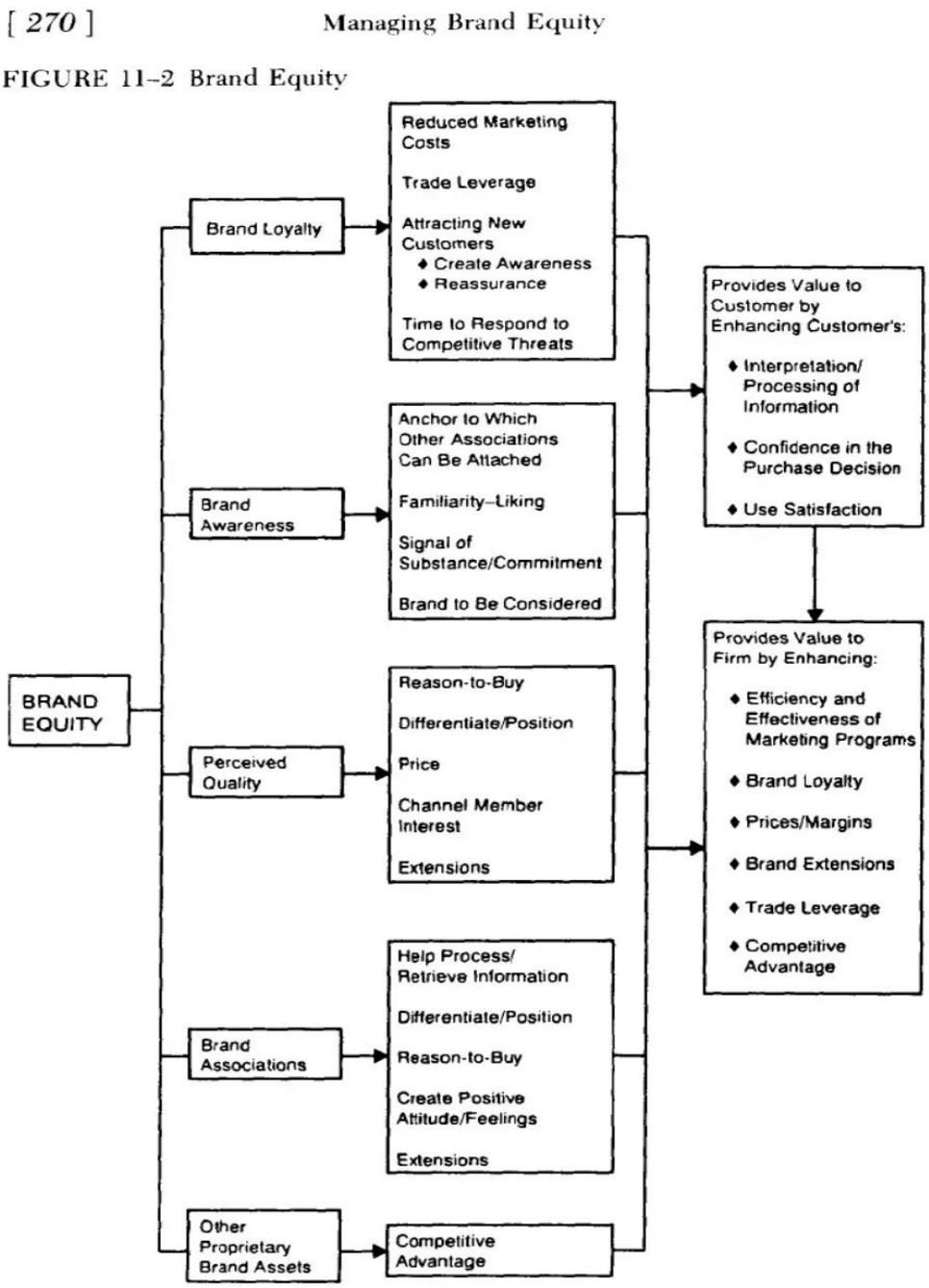


Figure 3.3 Brand equity

Source: Aaker (1991)

Expanding upon the “Five-Star” Brand Equity Model, Aaker (1996) further proposed a more refined Ten-Element Brand Equity Model. This model systematically evaluates brand

equity through ten specific indicators grouped into five dimensions: loyalty (including price premium, customer satisfaction/loyalty), perceived quality (including perceived quality and leadership), brand associations (including perceived value, brand personality, and organizational associations), brand awareness, and market performance (including market share, pricing, and distribution indices). Notably, this model was the first to integrate consumer cognitive perceptions (the first four dimensions) with objective market performance (the fifth dimension) into a unified evaluative framework, thereby providing a systematic basis for the quantitative study of brand equity (Li et al., 2015).

Meanwhile, from a brand identity management perspective, Kapferer (1992) introduced the Brand Identity Prism. This model conceptualizes brand identity as a six-facet prism, encompassing Physique, Personality, Culture, Relationship, Reflection, and Self-image. It systematically analyzes the complex interactions between the brand and consumers, and serves as a theoretical tool for understanding the deeper structural components of brand equity at the identity level (Figure 3.4).

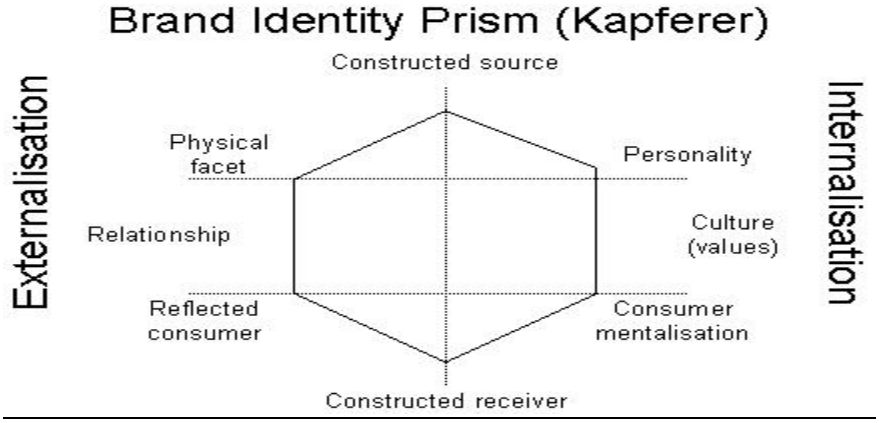


Figure 3.4 Brand identity prism

Source: Kapferer (1992)

In the field of consumer cognition, Keller has made landmark theoretical contributions. In 1993, he first explicitly articulated the concept of customer-based brand equity (Keller, 1993), and further proposed the Customer-Based Brand Equity (CBBE) Pyramid Model in 2001, which systematically delineates four progressive stages in building a strong brand: brand identity, brand meaning, brand responses, and brand resonance. This model provides a logically integrated and hierarchical analytic scaffold for investigating brand equity formation from the vantage point of consumer cognition (Figure 3.5).

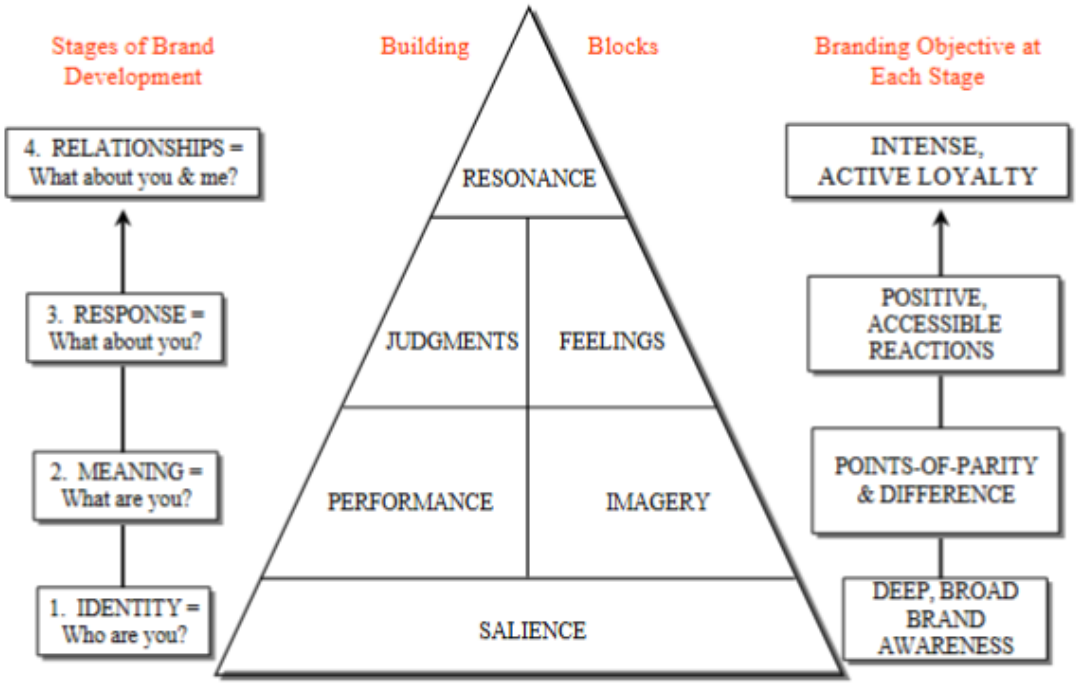


Figure 3.5 Customer-based brand equity pyramid model

Source: Keller (2006)

Within the Chinese market context, domestic scholars have likewise advanced localized model of consumer cognition. In particular, Wang, Yu, and Zhao (2008), proposed a model tailored to the Chinese context, comprising dimensions including brand awareness, brand affect, brand trust, and brand resonance. Anchored in brand awareness, the model posits that initial recognition shapes consumers' cognition, which in turn drives higher-order brand assets such as loyalty and price premium, ultimately reflecting in the firm's market share (Yu et al., 2008).

This model underscores the dual lens of consumer cognition and market outcomes, positing that brand equity accrues through a hierarchically structured interplay among brand awareness, affective trust, and brand resonance. Empirical investigations across categories such as sports footwear and mobile phones further corroborate that perceived quality and brand affect constitute the primary drivers of brand equity formation (Wang, 2014) (Figure 3.6).

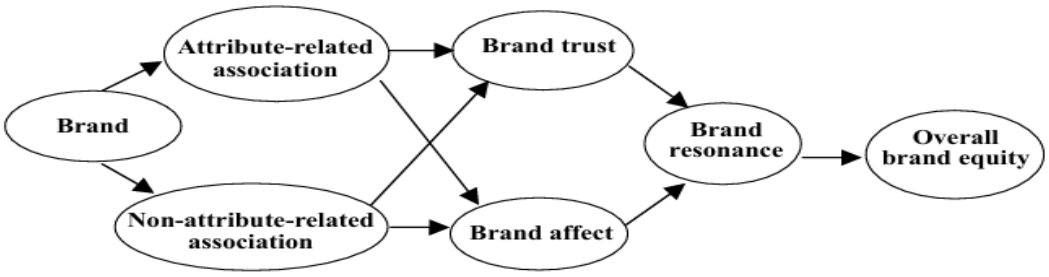


Figure 3.6 Customer-based brand equity model for the Chinese market

Source: Yu et al. (2008)

In recent years, research on brand equity in Chinese public hospitals has increasingly adopted patient-centered models as the dominant paradigm in research. Chen et al. (2019) proposed an evaluative framework comprising core indicators such as patient-perceived brand quality, service experience, and trust, emphasizing the direct influence of patient cognition on brand equity formation.

Another study employed structural equation modeling to verify the significant effects of brand awareness, loyalty, and brand quality on patient satisfaction, highlighting perceived quality as the central dimension of brand equity (Iliyaasi et al., 2025).

Furthermore, Zhu et al. (2024) integrated patient and resident perspectives to combine healthcare experience with brand associations, providing an assessment framework that bridges theoretical insights and practical applications in hospital brand management.

These research trends resonate with the key policy shift outlined in the *Opinions on Implementing the Healthy China Initiative* (The State Council, 2019), which emphasizes a transition from a "treatment-oriented" to a "people-centered" healthcare paradigm. Collectively, they underscore the significance and policy relevance of investigating public hospital brand equity from patient and public perspectives.

In light of the foregoing, the present study systematically constructs a measurement framework for public hospital brand equity from a patient-centered perspective and conducts empirical testing.

Synthesizing the preceding discussion and drawing upon the Customer-Based Brand Equity (CBBE) theoretical framework proposed by Aaker and Keller, this study, after carefully weighing the broad recognition and practical applicability of existing measurement models, adopts Aaker's "Five-Star" Brand Equity Model and the Ten-Element Brand Equity Model as its primary reference.

Notably, in light of the unique public-service nature of Chinese public hospitals and the specific characteristics of healthcare settings, this study excludes certain indicators from consideration: namely, the "other proprietary brand assets" dimension from the "Five-Star" Brand Equity Model and the "market performance" dimension from the Ten-Element Brand Equity Model.

Therefore, public hospital brand equity is conceptualized in this study as encompassing four dimensions—brand loyalty, brand quality, brand associations, and brand awareness—on which a corresponding set of measurable indicators is established. The subsequent sections detail the theoretical underpinnings and operational definitions of each dimension.

As the first measurement dimension, hospital brand loyalty is particularly critical for assessing public hospital brand equity. The classical conceptualization of brand loyalty originates from Oliver (1997), who defined it as "a consumer's enduring commitment to repurchase or repatronize a preferred brand", integrating both behavioral loyalty (repeat patronage) and attitudinal loyalty (emotional attachment).

In recent years, research has further elaborated on this concept within healthcare, emphasizing its dynamic nature. Brand loyalty is not merely manifested in patients' repeated selection of a hospital, but also reflects long-term relational bonds grounded in trust, satisfaction, and emotional connection. For instance, systematic reviews by Kim et al. (2022, 2021) indicate that hospital brand loyalty should capture both patients' behavioral intentions (e.g., willingness to revisit) and attitudinal commitment (e.g., brand identification).

Wathanakom et al. (2024), using Structural Equation Modeling, have demonstrated that in healthcare settings, brand loyalty is expressed through patients' propensity to return for services and reduced price sensitivity, sequentially mediated by service quality, satisfaction, and brand trust.

Domestic scholars have also explored hospital brand loyalty in the context of China's healthcare system. Chen et al. (2019) define it as patients' sustained preference for a hospital despite competitors offering higher-quality, lower-cost, or more convenient services. Such behavior indicates a high level of patient loyalty and substantial hospital brand equity.

Extending previous research, this study further proposes public hospital brand loyalty as patients' sustained utilization and active recommendation of a specific public hospital, grounded in trust, satisfaction, and emotional attachment. It is operationalized as patients' continued choice of and recommendation for the hospital despite various external influences, as well as their willingness to pay relatively higher fees for its services.

This dimension encompasses not only repeated utilization behavior but also positive emotional attachment to the hospital brand, strong recognition of service quality, and consistent support across varying contexts, making it a key indicator of public hospital brand equity.

Notably, price insensitivity is excluded from the measurement, given that public hospitals in China are non-profit institutions with prices strictly regulated by the government; thus, price is not a primary determinant in patients' hospital selection.

The second measurement dimension, brand quality, is defined as consumers' evaluation of the overall excellence of a product or service, reflecting their subjective perceptions rather than objective quality (Warsewicz, 2022). Keller further elaborates it as consumers' holistic perception of product or service quality, based on comparisons with intended purposes and alternatives.

In the healthcare context, brand quality encompasses both technical quality (e.g., medical equipment and professional competence) and functional quality (e.g., reliability, empathy, and responsiveness) (Azzahra et al., 2023). Hospital brand quality represents patients' comprehensive evaluation of medical services, environment, personnel, and overall experience, integrating both technical performance and soft service elements such as care processes, environmental facilities, and physician-patient communication.

Over the past five years, research has generally classified hospital brand quality into two dimensions: technical quality (medical outcomes and safety) and functional quality (service attitude, efficiency, and environment) (Medina-Aguerrebere et al., 2025).

In the era of digital healthcare, hospital brand quality further extends to online service experiences (e.g., website information transparency, appointment convenience, and social media interactions) and brand trust. All these dimensions shape patients' overall perception of the hospital brand (Shie et al., 2022).

Hospital brand quality thus reflects patients' perceived and evaluated overall excellence of services and constitutes a core dimension of hospital brand equity (Górska-Warsewicz, 2022; Syah et al., 2024).

Grounded in prior research and within the framework of public hospital brand equity, this study defines hospital brand quality as patients' and the public's comprehensive evaluation—encompassing both objective experiences and subjective perceptions—of the professional standards, service quality, and associated facilities of medical services.

Keller (1993), in his book *Conceptualizing, Measuring, and Managing Customer-Based Brand Equity*, categorized the third measurement dimension, brand associations, into three types: attributes, benefits, and attitudes.

Subsequently, Keller (2009b) defined brand associations as informational nodes linked to brand-related memory nodes, encapsulating the meaning of the brand to consumers. These associations can be categorized into product-related and non-product-related attributes, with product-related attributes referring to those essential for delivering product or service benefits sought by consumers.

In the hospital context, product-related attributes correspond to treatment outcomes (Wang et al., 2009). Chen et al. (2019) further argued that brand associations include indicators related to the hospital's nature and services.

Wang (2014), in *Brand Management*, similarly emphasized that brand associations are cognitive nodes connected to the brand in memory, which can be analyzed in terms of content (e.g., attributes, benefits) and characteristics (e.g., strength, preference, uniqueness), and recommended employing both qualitative and quantitative methods.

Building on these studies, this research defines public hospital brand associations as the multi-level cognitive and affective linkages activated when patients encounter or recall a hospital, encompassing perceptions of medical service quality, technical competence, service processes, public-service orientation, and emotional experiences. These associations constitute a dynamic, hierarchical cognitive network in patients derived from direct experience or indirect information. Their strength and distinctiveness are influenced by the interplay of government policies, hospital communication strategies, and patients' values.

As the fourth measurement dimension, brand awareness is defined by Aaker (2004) as a customer's ability to recall a brand within a given category. Keller (2014) emphasized it as consumers' overall impression of the brand, noting that it is constituted by both brand recognition and brand recall.

Chinese scholars have investigated brand awareness from multiple theoretical perspectives. Pan (2006) and Gao (2020) highlighted its dynamic nature and formation mechanisms from information-processing and cognitive perspectives. Wang elaborated on the cognitive processes underlying recognition and recall, suggesting that establishing brand awareness contributes to a "first-mover" competitive advantage. Some define public hospital brand awareness as the public's ability to identify and recall hospital names, logos, and reputation, a key component of brand equity (Liu, 2023).

This research defines public hospital brand awareness as the dynamic recognition, value assessment, and behavioral decision-making regarding hospital brand elements formed by patients and the public through direct experiences, social dissemination, and policy awareness in the healthcare context. Specifically, both rational evaluation (e.g., technical credibility) and emotional resonance (e.g., privacy protection) pathways drive patients' healthcare choices and brand loyalty.

It is worth noting that some scholars conceptualize brand awareness from the perspectives of stakeholders, including patients and medical staff. As this study centers on evaluating hospital brand equity from the patient (customer) standpoint, brand awareness is correspondingly defined from the patient (customer) perspective.

3.2.6 Differences between hospital and corporate brand equity

Since its proposition by Aaker (1991) and Keller (1993), the brand equity theory has primarily focused on corporate contexts, but in recent years its application in the public sector has become increasingly widespread (Casanoves-Boix et al., 2025). However, as not-for-profit organizations with a public service mission and subject to multiple institutional constraints, there are systematic differences between public hospital brand equity and corporate brand equity in terms of goal orientation, value connotation, evaluation subjects, and formation mechanisms.

First, there are differences in organizational objectives and value connotations. The ultimate goal of corporate brand equity is to enhance the brand market competitiveness, and achieve premium pricing capabilities and market share growth through dimensions such as brand loyalty, brand awareness, and perceived quality. However, as public-interest-oriented not-for-profit organizations, public hospitals have fundamentally distinct value connotations in their brand equity.

In their study of Ireland's public health service system, Casanoves Boix et al. (2025) demonstrated that brand awareness, brand image, perceived quality, and brand loyalty exert a significant impact on brand equity, with brand loyalty being the most significant factor. This finding indicates that in public health systems, brand equity is not measured by premium pricing power or market share, but rather by public trust and loyalty toward the healthcare system.

Stavař et al. (2026) further pointed out that the unique characteristics of the healthcare industry, including ethical norms and patient vulnerability, pose challenges to the direct

application of commercial brand models. Brand perception "reflects a complex mix of professional, ethical, financial, and relational factors."

Second, there are differences in the evaluation subjects and criteria. The evaluation subjects for corporate brand equity are the consumers, and the evaluation criteria primarily focus on consumer brand awareness, purchase intention, and repeat purchase behavior. Patients are the core evaluation subjects of public hospital brand equity, but the evaluation criteria have unique characteristics.

In an empirical study of public hospitals in China, Iliyaasi et al. (2025) explored the dimensions of hospital brand equity from the patient's perspective and found that all four dimensions—brand awareness, perceived quality, brand association, and brand loyalty—were significantly correlated with patient satisfaction.

In a comparative study of brand equity between public and private hospitals, Hamdi et al. (2026) found that hospital brand equity is "shaped not only by perceived service quality, but also by institutional reputation and the ability to establish strong emotional and relational bonds with patients." It indicates that unlike corporate brand equity which primarily relies on market-oriented marketing and brand promotion, the brand equity of public hospitals depends more on institutional reputation and the emotional bonds of the doctor-patient relationship. Therefore, the evaluation criteria should include not only patient satisfaction but also dimensions such as medical quality and service experience.

Finally, there are differences in formation mechanisms and driving factors. Corporate brand equity is primarily accumulated through marketing activities, advertising campaigns, and brand experiences. Its formation mechanism is a step-by-step process that begins with marketing investment, proceeds through the establishment of brand awareness and the cultivation of brand loyalty, and ultimately translates into market performance (Ewis & Abdou, 2025). However, the formation mechanism of public hospital brand equity exhibits unique characteristics.

Senyapar (2024) emphasized in a systematic study on brand building in the healthcare industry that brand equity plays a crucial role in shaping patient perception, organizational success, and overall health outcomes. Healthcare brand building requires a comprehensive consideration of multidimensional factors such as service quality, patient safety, and ethical practices.

In their empirical study on hospital brand equity, Zhu et al. (2024) explored evaluation methods from the perspectives of patients and residents, and they confirmed that medical

expertise, new media communication effectiveness, and brand association are key dimensions constituting hospital brand equity. It indicates that unlike corporate brand equity which primarily relies on marketing investments, the formation of public hospital brand equity is a complex process involving multidimensional factors such as medical expertise, service experience, communication effectiveness, and institutional reputation.

In summary, there are systematic differences between hospital brand equity and corporate brand equity in terms of goal orientation, value connotation, evaluation criteria, and formation mechanisms. The former is centered on public trust, with patient satisfaction and medical quality as the evaluation benchmark and multidimensional collaborative factors as the driving factor, while the latter is centered on commercial value, with consumer loyalty and market share as the evaluation benchmark and marketing investment as the driving factor.

3.2.7 Distinguishing between the objective and subjective attributes of hospital brand equity

Brand equity, as a critical intangible asset for enterprises, can be understood through two dimensions: objective attributes and subjective attributes. This distinction holds significant theoretical importance in research on brand equity, particularly for public hospitals that combine public service attributes with market competition characteristics. Clarifying the connotations of these two attributes and their interrelationships helps deepen our understanding of the formation mechanisms of hospital brand equity (Jaworeck, 2024).

The objective attributes of hospital brand equity refer to tangible elements and factual foundations that exist independently of patients' subjective perceptions and can be verified by third parties. They constitute the material foundation and core "hard power" of brand value. Specifically, in the hospital context, these objective attributes are primarily manifested in the following aspects.

In terms of technical strength, the objective attributes include disciplinary rankings, breakthroughs in core technologies, and the ability to translate research findings into clinical diagnostic and therapeutic standards (Górska-Warsewicz, 2022).

In terms of resource allocation, the objective attributes include the rational structure of a high-level expert team, the level of advanced medical equipment, the number of approved beds, and their actual turnover efficiency (Liu et al., 2025).

In terms of hardware facilities and application of information technology, the objective

attributes encompass the comfort and safety of the hospital's physical environment, the completeness of information systems such as appointment registration and electronic medical records, and the standardization of service processes (Zhu et al., 2024).

The objective attributes of hospital brand equity, in terms of quality indicators, are represented by quantifiable data such as the incidence of medical safety incidents, surgical success rates, patient readmission rates, and clinical treatment outcomes (Agency for Healthcare Research and Quality, 2020).

The subjective attributes of hospital brand equity refer to the sum of perceptions, emotions, attitudes, and evaluations held in the minds of patients, family members, potential patients, and the local community. Although these attributes originate from objective facts, they undergo individual psychological processing to form a unique and stable subjective understanding of the brand, and are the ultimate manifestation of brand equity value (Maulana & Ayuningtyas, 2023). Aaker's (1991) theoretical framework of brand equity defines subjective attributes through brand loyalty, perceived quality, brand association, and brand awareness, which serves as a crucial theoretical foundation for subsequent research.

The aforementioned objective attributes constitute the foundation of hospital brand equity, while subjective attributes reflect patients' cognitive evaluation and emotional attachment to the hospital brand. Objective and subjective attributes are not isolated from each other but exhibit a dynamic interactive relationship.

To be specific, objective attributes serve as the prerequisite for establishing patient trust and cognitive awareness. Without advanced medical technology and a safe treatment environment, subjective attributes are unlikely to receive positive evaluations (Górska-Warsewicz, 2022). Objective attributes provide verifiable factual evidence, which establishes a cognitive framework for patients' subjective perceptions.

On the other hand, subjective attributes act as amplifiers of the value of objective attributes. Research shows that patients' perceived quality of objective attributes often exceeds the original level of objective indicators, resulting in a certain degree of perceptual bias. Objective factors (such as technology and facilities) are transformed into higher brand equity value through psychological mechanisms including service quality perception, emotional resonance, and brand association after being processed subjectively by patients (Zhu et al., 2024).

Feedback on subjective attributes (such as patient satisfaction and loyalty) will, in turn, influence the investment decision of hospitals on objective attributes. The increased revisit

rate resulting from high loyalty will motivate hospitals to further invest in technological innovation and service quality, thereby forming a virtuous cycle that begins with investment, progresses through cognition and loyalty, and ultimately leads to performance improvement (Putri et al., 2023).

3.3 Hierarchical structure of hospital dynamic capabilities and brand equity

3.3.1 Aggregation mechanism of hospital dynamic capabilities

In research on public hospital management, dynamic capabilities, as a core mechanism for organizations to adapt to environmental changes and obtain sustainable competitive advantages, are characterized by multi-level and nested structures. In recent years, empirical studies have shown that the overall dynamic capabilities of hospitals (such as sensing, learning, and integrative capabilities) are not abstract concepts, but are aggregated from the micro-dynamic capabilities of various clinical departments (Van de Wetering, 2021; Van de Wetering et al., 2022).

This logic stems from the hierarchical nature of dynamic capabilities: organizational-level capabilities need to be realized through the coordination and emergence of department-level capabilities (Benzidia et al., 2023).

Pan and Xie (2021) argued that departments are the basic units composing hospitals and the fundamental structures for exerting hospital functions. Strengthening the construction of branded departments is one of the important connotations for ensuring the construction and development of hospitals.

The sensing capability of clinical departments is reflected in the keen identification of medical technology iteration, changes in patient needs, and policy orientations. For example, departments capture signals of changes in the external environment by real-time monitoring of clinical data, participating in academic exchanges, and analyzing patient feedback (Van de Wetering, 2021).

The learning capability is reflected in absorbing new knowledge through case discussions, technical training, and cross-departmental knowledge sharing to develop continuously improved clinical pathways and diagnosis and treatment plans (Van de Wetering, 2021). The integrative capability is manifested in optimizing resource allocation, coordinating multi-disciplinary teamwork, and innovating service models to transform new

knowledge into executable clinical practices (Benzidia et al., 2023).

Studies have further confirmed that the synergistic effect of capabilities at the department level directly determines the effectiveness of the overall dynamic capabilities of hospitals. Van de Wetering et al. (2021), through empirical analysis of departments in 90 hospitals, found that departments' digital dynamic capabilities (the ability to use big data and AI technologies to sense and respond to patient needs) significantly improved hospitals' patient service performance and market competitiveness.

In addition, Benzidia et al. (2023) pointed out that hospitals' big data analysis capabilities need to rely on green process innovation in clinical departments (such as reducing medical waste and optimizing supply chains) to achieve improvement in operational efficiency. These studies all emphasize that the formation of hospital dynamic capabilities essentially results from the systematic integration and restructuring of capabilities at the departmental level through a bottom-up process (Van de Wetering, 2021).

3.3.2 Synergistic effect of the hospital brand equity

In the brand management theory, the hospital brand equity is regarded as a composite entity jointly constituted by sub-brand equity at multiple levels. A systematic literature review indicates that patients' loyalty to hospitals, brand quality, brand associations, and brand awareness often stem from the independent performance and synergistic effects of various clinical departments in terms of service, technology, and image (Górska-Warsewicz, 2022).

This viewpoint echoes the multi-dimensional brand equity model proposed by Aaker. Following studies have further refined "brand awareness, brand image, and brand loyalty" into "customer-oriented brand equity, finance-oriented brand equity, and relationship-oriented brand equity", among which service quality and patient experience at the departmental level are key elements of relationship orientation (Kurscheidt, 2020).

Empirical studies in China have also confirmed that departmental branding contributes to the hospital's overall brand. In a case analysis of the brand-construction paths of multiple departments in West China Second University Hospital, Sichuan University, Xie (2024) pointed out that departments help create unique brand associations in patients' minds by providing high-quality diagnosis and treatment technologies, personalized patient care, and a unified visual identity system, thereby enhancing the overall brand awareness and loyalty of the hospital.

In international practice, the departmental brand equity model has been explicitly used to

explain the amplification effect of internal brands on external brands. The departmental brand equity model proposed by Kurscheidt (2020) integrated "brand equity levers (such as internal communication and external publicity)" with "the core dimensions of brand equity (brand cognition, brand awareness, brand image)". It highlights that when departments can effectively utilize internal resources and convey consistent brand information externally, both the brand quality and loyalty of the overall hospital brand will be significantly improved.

Similarly, in an empirical study of a hospital in Indonesia, Irmayani et al. (2024) found that social media marketing enhanced the perception of the overall hospital's brand equity by strengthening the brand image of various departments, thereby promoting patients' willingness to return for follow-up visits.

The structural role of brand equity has also been verified at the level of patient behavior. In an empirical analysis of children's hospitals in Sri Lanka, Wickremasinghe and Gamini (2020) found that the direct impact of perceived nursing quality on patient loyalty was significantly amplified under the mediating effect of brand equity, indicating that the brand equity (especially brand associations and brand awareness) serves as a crucial bridge linking connecting quality perception to loyal behaviors.

3.4 Hypotheses

Based on the integrated framework of dynamic capabilities theory and brand equity theory, grounded in the organizational characteristics of public hospitals in China and the context of medical services, this study puts forward the core proposition: the dynamic capabilities of public hospitals systematically drive their brand equity. This driving effect operates through differentiated pathways by which the three core dimensions of dynamic capabilities (sensing capability, learning capability, and integrative capability) influence the four constituent dimensions of brand equity (brand loyalty, brand quality, brand associations, and brand awareness).

Specifically, the hypothesis system constructed in this study includes one overall hypothesis and 12 sub-hypotheses. The overall hypothesis (H0) verifies the impact of the overall dynamic capabilities of hospitals on the hospital brand equity. The sub-dimensional hypotheses separately test the specific effects of sensing capability (H1–H4), learning capability (H5–H8), and integrative capability (H9–H12) on the four dimensions of brand

equity.

H0 (Overall hypothesis): The dynamic capabilities of public hospitals have a significant positive impact on their brand equity.

H1: The sensing capability of hospitals has a significant positive impact on brand loyalty.

H2: The sensing capability of hospitals has a significant positive impact on brand quality.

H3: The sensing capability of hospitals has a significant positive impact on brand associations.

H4: The sensing capability of hospitals has a significant positive impact on brand awareness.

H5: The learning capability of hospitals has a significant positive impact on brand loyalty.

H6: The learning capability of hospitals has a significant positive impact on brand quality.

H7: The learning capability of hospitals has a significant positive impact on brand associations.

H8: The learning capability of hospitals has a significant positive impact on brand awareness.

H9: The integrative capability of hospitals has a significant positive impact on brand loyalty.

H10: The integrative capability of hospitals has a significant positive impact on brand quality.

H11: The integrative capability of hospitals has a significant positive impact on brand associations.

H12: The integrative capability of hospitals has a significant positive impact on brand awareness.

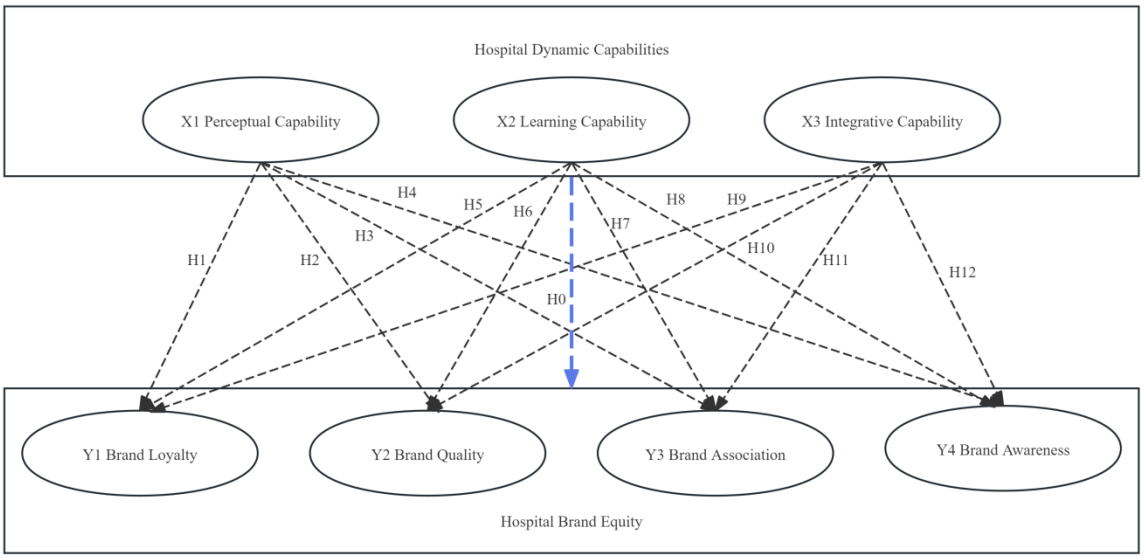


Figure 3.7 Theoretical hypothesis model

This study will develop an integrated set of hypotheses at both the holistic and dimensional levels, aiming to reveal the underlying relationship between the dynamic capabilities and brand equity of public hospitals through empirical data.

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Chapter 4: Research Method

4.1 Literature analysis method

The literature analysis method is a systematic research approach in which researchers retrieve, collect, and identify existing literature (including books, journals, reports, archives, and others), and then conduct qualitative or quantitative analysis of the content. This process enables them to grasp the essential features, historical evolution, and current research status on a given topic, and on that basis, develop their own research perspectives or theoretical framework (Feng, 2012). This method usually includes key steps such as defining the research topic and retrieval scope, extensively collecting literature through channels like libraries and databases, screening, classifying, and organizing the literature, conducting inductive comparison and critical analysis of the content, and on this basis, extracting core concepts, constructing theoretical frameworks, or proposing research hypotheses. A systematic literature analysis enables researchers to identify gaps in existing academic achievements, discern disciplinary trends, and establish a solid theoretical basis for subsequent empirical inquiry.

In the context of this study, literature analysis was conducted with a focus on three key aspects.

First, in constructing the theoretical framework, this study systematically reviewed the core literature on dynamic capabilities theory and brand equity theory. Major Chinese-and English-language databases, including Web of Science, Google Scholar, PubMed, and China National Knowledge Infrastructure (CNKI) were searched to analyze foundational works such as Teece et al.'s "sensing-seizing-reconfiguring" framework of dynamic capabilities and the pioneering research of scholars such as Aaker and Keller on the dimension division and measurement models of brand equity. Building on this review, a content-based analysis of the literature identified a research gap in applying dynamic capabilities theory to public-service organizations (especially medical institutions), thus defining the theoretical starting point of this study.

Second, in designing research methods, literature analysis provides a methodological basis for the design and implementation of empirical research. Relevant theories and

empirical studies on hospital dynamic capabilities and brand equity were reviewed to trace the theoretical origins of core concepts such as the resource-based view, dynamic capabilities, and brand equity, as well as their specific definitions in the field of medical management, especially conducting in-depth analysis of the dimension division of hospital dynamic capabilities and hospital brand equity. On this basis, the study developed measurement dimensions of dynamic capabilities and brand equity suitable for the institutional background and operational characteristics of Chinese public hospitals, thus providing a conceptual foundation for subsequent scale development and empirical testing. Meanwhile, the analysis of literature on the application of the Delphi method provides important references for designing expert selection criteria, consultation processes, and data processing methods in this study. Similarly, the analysis of literature on the application of the case study method provides a methodological basis for case selection, triangulation validation of data collection, and empirical case analysis.

Third, with respect to policy-context analysis, this study examined government work reports and medical and healthcare policy documents and other official texts to trace the policy trajectory of public hospital reform. Particular attention was paid to how policy directions such as the construction of modern hospital management systems and the push for high-quality development impose new demands on hospitals' dynamic capabilities. This analysis helped align the theoretical framework with practical needs in this study, thereby strengthening the practical explanatory power and applied value of the research findings.

4.2 Delphi method: scale development and validation

Delphi method is a structured group communication technique aimed at gradually collecting opinions and reaching the consensus through multiple rounds of anonymous expert surveys and controlled feedback. This method was originally developed by the RAND Corporation in the 1950s for military technology prediction, and has since been widely applied in fields such as prediction, decision support, and policy-making (Sajesh, 2018).

This method has four typical characteristics.

First, anonymity is maintained among experts to prevent social factors such as identity and status from influencing their opinions.

Second, it uses an iterative questionnaire process, where after each round of survey, experts are provided with statistical summaries and reasons behind the results from the

previous round.

Third, a controlled feedback mechanism is introduced, allowing experts to rationally adjust their judgments based on the understanding of the group opinion distribution.

Fourth, statistical analysis, such as calculating the mean and standard deviation, is performed on each round's results to objectively assess the degree of consensus. Through this systematic process, the Delphi method can effectively integrate expert experience and collective wisdom in research contexts where information is incomplete or highly uncertain, thereby producing reliable conclusions or forecasts.

This study selected 30 experts with intermediate-level or senior professional titles and over 15 years of experience in fields such as hospital management, hospital brand management, health policy, and public administration. These experts were recruited from medical institutions, universities, research institutes, and relevant administrative departments.

Expert consultations were conducted via face-to-face interviews or email correspondence to gather input on three main aspects: the design of a dynamic capabilities measurement questionnaire for medical institutions, the design of a brand equity measurement questionnaire for medical institutions, and the construction of a hypothesized model for the relationship between dynamic capabilities and brand equity.

Two rounds of consultation were organized. The results were then analyzed in terms of the concentration and coordination of expert opinions, as well as the internal consistency reliability and validity of the feedback received.

4.2.1 Design of the expert consultation questionnaire

The Delphi expert consultation questionnaire employed in this study consisted of three main sections.

The first section provided instructions, aiming to clarify the consultation objectives (namely, to construct a measurement scale for public hospitals' dynamic capabilities and brand equity), outline the research background, and specify the guidelines for completion, feedback methods and deadlines. A note of appreciation was included at the end of this section.

The second section collected basic expert information, including demographic characteristics and academic-professional backgrounds, in order to assess the experts' qualifications and the representativeness of the sample.

The third section formed the core of the indicator evaluation. Experts were invited to conduct a multi-dimensional review of the preliminary indicators at all levels. For each indicator, they were asked to choose among “Approve” “Delete” “Modify” or “Add” and to provide specific reasons for their judgment. Additionally, they rated each indicator on its importance, their own familiarity with it, and the basis of their judgment. The questionnaire also included an “Additional Suggestions” section to gather constructive feedback for refining the scales.

To ensure the scientific rigor of the Delphi consultation and the reliability of its conclusions, this study established strict criteria for expert selection. The selection was guided by three main principles: the authority of the experts, their representativeness in the field, and the feasibility of their participation.

Specifically, eligible experts were required to have at least 10 years of research or practical experience in health administration, clinical medicine, or related fields, to hold a master’s degree or higher, and to possess a professional title at the associate senior level or above, or to hold an administrative position at the deputy division level or higher.

Furthermore, participation was voluntary and based on informed consent, with experts expected to commit to completing the full consultation process, which consisted of two to three rounds. These criteria collectively helped ensure the professional depth of the expert panel, the breadth of perspectives obtained, and the smooth progression of the study.

4.2.2 Expert consultation process and quality control

Based on the established selection criteria, a total of 30 qualified experts were included in this study.

The expert consultation was conducted in two rounds: the first was from May to June 2025, and the second was from July to August of the same year. Questionnaires for both rounds were distributed and collected via each expert’s preferred method (e.g., email, WeChat, or postal mail). A two-week interval was maintained between rounds to ensure a consistent and efficient schedule.

After collecting the first-round questionnaires, the study collated and analyzed the expert feedback, which was then used to revise the questionnaire for the second round. The process for the second round was identical to that of the first.

To ensure the independence of opinions, the entire process was conducted anonymously, and experts were prevented from discussing their responses with one another. Following data

collection, statistical analysis was performed using Excel, and the experts' qualitative comments were systematically collated and synthesized.

4.2.3 Expert composition and characteristics

Based on the profiles of the 30 experts invited for the Delphi consultation in this study, a systematic analysis is presented from three dimensions: selection scope and age structure, disciplinary background and professional experience, and academic/professional titles and educational attainment.

Experts were selected from academic institutions and medical institutions. Among the participants, 14 (46.7%) are from higher education institutions, specializing in medical/health management and brand strategy research. The remaining 16 (53.3%) are members of the management teams at tertiary public hospitals, including hospital executives, section directors, and heads of administrative departments.

The panel consisted of experts aged 40 to 62 (mean = 52.5 years). This represents a mature profile, with middle-aged experts (45-55 years) constituting the core (46.7%) and senior experts (56 years and above) accounting for 40%, ensuring a balance of practical experience and forward-looking perspective.

All experts have been engaged long-term in work related to hospital management, health policy, or brand operations, with an average professional experience of 29.6 years. 56.7% of them have more than 30 years of experience, constituting a deeply experienced panel.

The distribution of their positions showed a multi-level structure: 50% of the experts served as department/section heads, 10% as deputy heads, 3.3% as assistant heads, and 36.7% had experience in hospital-level leadership. This composite administrative background effectively integrated strategic policy, operational management, and departmental practice, significantly enhancing the practical applicability of the measurement tools.

The expert panel demonstrates high professional standing. Specifically, 80% hold full senior professional titles and 20.0% hold associate senior titles, resulting in 100% coverage of senior-level titles. In addition, 66.7% hold doctoral degrees and 33.3% hold master's degrees, meaning all experts possess at least a master's qualification.

This composition ensures both the authority of the consultation and provides solid scholarly support for the theoretical framework. In summary, the expert panel in this study is well-structured and highly experienced in terms of professional qualifications, practical expertise, and academic caliber, enabling it to deliver high-quality professional consensus

for developing a brand equity measurement system for public hospitals.

4.2.4 Analysis of expert consultation results

The first round of the Delphi expert consultation was conducted between May and June 2025. The initial measurement tool used was the Measurement Scale for Public Hospitals' Dynamic Capabilities and Brand Equity (Version 1.0). This scale comprises a Dynamic Capability Subscale (containing 3 first-level, 12 second-level, and 46 third-level indicators) and a Brand Equity Subscale (containing 4 first-level, 12 second-level, and 49 third-level indicators). In total, the scale consists of 7 first-level, 24 second-level, and 95 third-level indicators (see Annex E).

Questionnaires were distributed to all 30 experts in this round, and 30 valid responses were collected, yielding a 100% valid response rate. The collected data were processed according to a standardized research protocol. First, a database was created using Excel. Data entry and verification were performed by two individuals independently to ensure accuracy through cross-checking. Second, the indicators were quantitatively assessed in strict accordance with the Delphi method standards, based on two core criteria: 1) calculating the approval rate (i.e., the percentage of experts who voted to retain each indicator), and 2) calculating the mean importance score for each indicator based on a five-point Likert scale (where 1 means very unimportant and 5 means very important). The exclusion criteria established in this study were an approval rate below 80% or a mean importance score below 3.0 points.

The data analysis from the first round of consultation shows that the expert approval rates and mean importance scores for all 7 first-level indicators and 24 second-level indicators met the pre-defined retention criteria, indicating a high level of expert consensus on the overall theoretical framework. However, among all 95 third-level indicators, 17 did not meet the retention criteria due to approval rates below 80% or a mean importance score below 3.0 points. This outcome suggests a degree of redundancy in the initial indicator pool, and indicates that the wording of some indicators, or their logical fit within their respective dimensions, requires improvement.

Based on these criteria and the analysis, the study eliminated these 17 third-level indicators. This resulted in the Measurement Scale for Public Hospitals' Dynamic Capabilities and Brand Equity (Version 2.0) containing 78 third-level indicators, which served as the basis for the second round of expert consultation (see Annex F).

Specifically, the revisions at each indicator level are detailed below.

All seven first-level indicators from the first-round scale (three for dynamic capabilities and four for brand equity) successfully passed the screening. The expert approval rates for all first-level indicators exceeded the 80% retention threshold, and their mean importance scores (based on the five-point Likert scale where 1 means very unimportant and 5 means very important) were all above 3.0 points, confirming strong expert agreement on the theoretical dimensions. Consequently, all the first-level indicators were retained.

All the 24 second-level indicators included in the first-round scale (12 for dynamic capability and 12 for brand equity) met the retention criteria. The expert approval rates and mean importance scores for all these indicators satisfied the aforementioned conditions, indicating a sound structural design. Thus, all the second-level indicators were retained.

Following statistical analysis of the 95 third-level indicators (46 for dynamic capabilities and 49 for brand equity), 17were subsequently excluded for failing to meet the retention thresholds of an expert approval rate of at least 80% or a mean importance score of 3.0 points (see Annex G, Annex H).

Based on the feedback from the first round of consultation, the study developed the Measurement Scale for Public Hospitals' Dynamic Capabilities and Brand Equity (Version 2.0). This version comprises 7 first-level indicators, 24 second-level indicators, and 78 third-level indicators, reflecting a reduction of 17 items from Version 1.0.

Subsequently, the second round of the Delphi expert consultation was conducted from July to August 2025. Data analysis in this round followed the same method as in the first.

The results showed that the expert approval rates for all indicators exceeded 80%, and their mean importance scores were all above 3.0 points, indicating strong consensus among the expert panel and convergence of opinions on the scale items. Accordingly, all indicators in Version 2.0 of the scale were retained, marking the successful completion of the two-round Delphi consultation and reflecting stable expert-level consensus on the final scale.

4.2.5 Hospital dynamic capabilities scale development

The valid measurement of hospital dynamic capabilities is the prerequisite and foundation for empirically evaluating their relationship with brand equity. Accordingly, this section details the study's approach to conceptualizing hospital dynamic capabilities, specifying their dimensional structure, and constructing the measurement instrument. Informed by Teece's (1997) dynamic capabilities framework, this study develops a measurement system tailored to

the institutional setting and management of China's public hospitals.

4.2.5.1 Principles for selecting indicators for measuring hospital dynamic capabilities

In selecting indicators to measure the dynamic capabilities in public hospitals, this study adheres strictly to four principles: scientific rigor, research value, practical significance, and operational feasibility.

Scientific rigor. The measurement framework constructed in this study is grounded in Teece's dynamic capabilities theory and closely aligned with the unique institutional context and policies of China's reform of medicine and healthcare system. Using sensing capability as an illustration, indicators such as the "coverage of common and frequently occurring diseases by specialized outpatient clinics" and the "adaptive mechanisms for clinical departments under medical insurance reforms" are designed to translate the theoretical function of opportunity recognition into observable and measurable behaviors in healthcare service scenarios. These indicators provide systematic tools for assessing public hospitals' service model transformation and responsiveness under policy-driven conditions.

Research value. This measurement system advances beyond the traditional static paradigm of hospital management research by operationalizing dynamic capabilities theory into observable and measurable variables.

Specifically, in the dimension of learning capability, indicators such as "number of newly introduced knowledge and technologies" and "monetary value of research outputs transformed into practice" quantify the extent to which knowledge flows drive technological renewal. In the integrative capability dimension, indicators including the "proportion of level-IV surgeries among discharged patients" and "diagnosis and treatment rate based on appointments" focus on critical issues in resource allocation and efficiency improvement during the high-quality development of public hospitals. Together, these indicators generate robust insights for decisions on resource reallocation and operational optimization.

Practical significance. The proposed indicators are closely guided by priority issues of China's reform of the medical and healthcare system. Within the sensing capability dimension, for instance, indicators such as the "establishment of specialized outpatient clinics" and the "institutional units and mechanisms for improving patient experience" directly respond to the *Opinions on Further Improving the Medical and Health Service System* (The General Office of the Central Committee of the Communist Party of China and the General Office of the State Council, 2023). Also, these indicators provide hospital

managers with quantifiable tools to discern patient needs and guide the optimization of service delivery.

Similarly, in the integrative capability dimension, indicators such as “postoperative complications”, “proportion of level-four surgeries among discharged patients”, and “average waiting time after outpatient appointment” focus on quality, safety, and efficiency of medical services—key priorities in national performance evaluation index system of tertiary public hospitals—while offering empirical evidence for continuous improvement in resource integration and operational refinement.

Operational feasibility. Indicator design relies on quantifiable policy standards and existing data sources. For instance, in the learning capability dimension, indicators such as “annual investment in learning resources” and “monetary value of research output per 100 healthcare professionals” can be directly retrieved from hospital financial and research management systems. In the integrative capability dimension, indicators such as “bed occupancy rate”, “staffing ratios”, and “number of pharmacists per 100 beds” adopt standardized definitions from official reports of the National Health Commission, ensuring consistency and accessibility of data for empirical research.

4.2.5.2 Measurement scale and questionnaire for dynamic capabilities of public hospitals

As previously discussed, this study draws upon Teece’s definition (1997) and three-dimensional framework of dynamic capabilities (2007), combined with the independently developed concepts and dimensional classification of public hospital dynamic capabilities presented earlier. Also, following four guiding principles for indicator selection-scientific rigor, research value, practical significance, and operational feasibility-and after two rounds of expert consultation as well as corresponding reliability and validity tests, a three-tiered measurement scale, the *Public Hospital Dynamic Capabilities Measurement Scale*, has been developed. This scale comprises 3 first-level indicators, 12 second-level indicators, and 35 third-level indicators.

The first-level indicators include sensing capability, learning capability, and integrative capability. Sensing capability covers 3 second-level indicators—patient needs identification, policy environment perception, and multidimensional responsiveness—which are further measured through 11 third-level indicators, such as subspecialty establishment, specialized outpatient clinic openings, and coverage of diagnostic groups (DRG). Learning capability comprises 5 second-level indicators: knowledge acquisition channels/content, investment in

learning and research, organizational learning, learning outcomes, and human resources, and is quantified by 12 third-level indicators including the number of newly introduced knowledge and technologies, research project funding, and monetary value of research outputs transformed into practice. Integrative capability is assessed through 4 second-level indicators: quality and safety, technical capability, service processes, and resource allocation and utilization, and is captured by 12 third-level indicators such as bed occupancy rate, staffing ratios, and average waiting time after outpatient appointments (see Annex A).

Among the 35 third-level indicators, 18 (e.g., proportion of day surgeries, growth rate of outpatient cost per visit, proportion of level-four surgeries among discharged patients) have been adapted from national performance evaluation index system of tertiary public hospitals (e.g., growth rate of outpatient cost per visit), performance evaluation index system of Guangdong provincial-level tertiary public hospitals (e.g., proportion of day surgeries among elective procedures), and commonly used core efficiency indicators for healthcare institutions (e.g., bed occupancy rate) (National Health Commission of the People Republic of China, 2023), thereby ensuring consistency and comparability with authoritative policy evaluation systems.

The remaining 17 indicators have been designed in accordance with the dynamic capabilities theory, and are closely aligned with current healthcare reform policies as well as the practical management needs of hospitals.

Based on the above measurement scale, this study further developed the *Public Hospital Dynamic Capabilities Questionnaire*, with specific survey items corresponding to all 35 third-level indicators. A five-point Likert scale was employed as the measurement tool. Following two rounds of expert consultation, the questionnaire underwent reliability and validity testing and was ultimately finalized as a robust empirical data collection instrument, providing a solid foundation for subsequent analyses (see Annex B).

4.2.6 Hospital brand equity scale development

This section systematically constructs a measurement framework for public hospital brand equity. Initially, through a comprehensive review of brand equity theories, the study establishes a patient-centered research perspective. Drawing on Aaker’s “Five-Star” model and the Ten-Element model as the core theoretical foundation, and taking into account the public-service nature of public hospitals, a four-dimensional conceptual model is

independently defined, comprising brand loyalty, brand quality, brand associations, and brand awareness.

Subsequently, to ensure scientific rigor and validity of the measurement tools, the study specifies four guiding principles for indicator selection: integrity, independence, foresight, and operational feasibility. Finally, based on the aforementioned theoretical framework and selection principles, and following two rigorous rounds of Delphi expert consultation and reliability and validity testing, a hierarchical *Public Hospital Brand Equity Measurement Scale* was developed, consisting of 4 first-level indicators, 12 second-level indicators, and 43 third-level indicators. Based on this scale, a corresponding questionnaire using a five-point Likert scale was constructed, thus providing a robust tool for empirical data collection in subsequent analyses.

4.2.6.1 Principles for selecting public hospital brand equity measurement indicators

To ensure that the constructed measurement system for public hospital brand equity is scientifically rigorous, systematically comprehensive, and practically applicable, this study adheres to four fundamental principles in selecting indicators.

First, the principle of comprehensiveness. Indicators should fully cover the core dimensions of brand equity theory-including brand loyalty, brand quality, brand associations, and brand awareness-so as to build a hierarchically structured and complete evaluation system that accurately reflects the overall of public hospital brand equity.

Second, the principle of independence. Each measurement indicator should possess a clear conceptual definition and distinct observation target, avoiding dimensional overlap or content redundancy, thereby ensuring logical rigor and precise results, and providing a reliable foundation for subsequent data analysis and interpretation.

Third, the principle of foresight. While inheriting the essence of classical brand equity theories, the selection of indicators should actively incorporate the latest developments and trends in brand research and align closely with the current state of public hospital brand building, ensuring theoretical depth, innovative value, and policy relevance.

Finally, the principle of operational feasibility. The design of the indicators takes into account the specific institutional environment, resource conditions, and management needs of Chinese public hospitals, aiming for conceptual clarity, well-designed item, and data accessibility, so that the measurement tools are easy to implement, straightforward to interpret, and effectively supports the diagnosis and optimization of hospital brand management.

4.2.6.2 Construction of the public hospital brand equity measurement scale and questionnaire

Drawing on Aaker's "Five-Star" Brand Equity Model and Ten-Element Brand Equity Model, this study, after excluding the indicators of "other proprietary brand assets" and "market performance," and in alignment with the defined dimensions of public hospital brand equity, constructed a hierarchical measurement scale and corresponding questionnaire. The development process adhered to four guiding principles—scientific rigor, research value, practical significance, and operational feasibility—and involved two rounds of expert consultation as well as reliability and validity testing.

The measurement scale is structured across three levels: 4 first-level indicators, 12 second-level indicators, and 43 third-level indicators. The first-level indicators comprise hospital brand loyalty, hospital brand quality, hospital brand associations, and hospital brand awareness. Hospital brand loyalty is organized into 3 second-level dimensions—behavioral loyalty, attitudinal loyalty, and crisis support—further divided into 10 third-level indicators. Hospital brand quality includes 3 second-level dimensions—technical quality, functional quality, and social responsibility—encompassing a total of 10 third-level indicators. Hospital brand associations are structured around 3 second-level dimensions—associative attributes, associative strength, and associative preference—comprising 12 third-level indicators. Finally, hospital brand awareness is divided into 3 second-level dimensions—experiential recognition, relational recognition, and communicative recognition—accounting for 11 third-level indicators (see Annex C).

Based on this scale, a corresponding questionnaire was developed, with each of the 43 third-level indicators operationalized through specific items and measured on a five-point Likert scale. Following two rounds of expert consultation and rigorous reliability and validity testing, the questionnaire serves as a standardized measurement tool for data collection, providing robust support for subsequent empirical analysis (see Annex D).

4.2.7 Rationale for scale design

During the development of the dynamic capability and brand equity scale, we incorporated performance evaluation indicators for national tertiary public hospitals, provincial healthcare quality evaluation systems, and industry-standard operational indicator systems into the measurement framework. This approach effectively enhanced the policy compatibility, practical interpretability, and data availability of the scale.

In constructing the dynamic capability scale, based on Teece's classic theoretical framework, we integrated core indicators from national performance evaluation of tertiary public hospitals, provincial assessment, and routine evaluation of medical institutions. Among the 35 tertiary indicators, 18 are directly adopted from these authoritative systems, such as "proportion of Grade IV surgeries among discharged patients," "average waiting time for outpatient appointments," and "bed occupancy rate."

This design endows the measurement tool with dual attributes. On the one hand, the indicators come from verifiable official statistical data, which ensures the reliability and comparability of data collection. On the other hand, the scale content aligns deeply with the current policy orientation for high-quality development of public hospitals, which enhances the practical explanatory power and policy relevance of the research conclusions.

The design is also supported by relevant research. Qin et al. (2021) have decomposed the national performance evaluation indicators for tertiary public hospitals and integrated them into hospital performance evaluation systems, which has enhanced the applicability of empirical research within specific institutional contexts.

According to Chen et al. (2024), objective behaviors such as resource reorganization and process optimization are concrete manifestations showing how dynamic capabilities play their role, which can be validated through operational indicators such as average length of stay, patient satisfaction, and bed turnover rate. Van Beers et al. (2026) also argue that objective practices such as lean processes and resource reallocation in hospitals can be quantitatively assessed using operational efficiency data such as treatment duration and cost control.

In the construction of the brand equity measurement scale, we continue to adopt the core framework of brand equity theory of Aaker (1991), and emphasize effective alignment with policy orientations and industry practices. The design of the indicators in the scale fully responds to national policy requirements to"improve the healthcare experience and enhance patient satisfaction". We have incorporated dimensions such as patient satisfaction, healthcare experience evaluation, and hospital reputation dissemination into the measurement system. With patients as the primary evaluators, the scale collects raw data through patient surveys. This design aligns with the customer-oriented brand equity perspective of this study (Keller, 1993) and also conforms to the "patient-centered" policy orientation of the Healthy China strategy.

To sum up, this scale demonstrates theoretical rigor, institutional adaptability, and

methodological feasibility. Its rationality is supported by both academic literature and practical logic, which provides a reliable measurement tool for future empirical studies on the relationship between dynamic capabilities and brand equity.

4.3 Questionnaire survey: data collection and processing

This section systematically details the data collection and processing procedures of the questionnaire survey, centering on the relationship between dynamic capabilities and brand equity in public hospitals. Regarding sample selection, the unit of analysis was shifted down to the clinical department level. Based on the sampling frame of 48 clinical departments in the case hospital, 30 clinical departments were selected as the research sample using stratified sampling. Concurrently, patients from these 30 departments were selected via random sampling to measure brand equity perceptions, thereby ensuring the equivalence of the two core concepts at the analytical unit.

In terms of measurement implementation, between September and October 2025, surveys were conducted targeting the heads of the 30 clinical departments and their respective patients using the Dynamic Capabilities Questionnaire and the Brand Equity Questionnaire, both developed through Delphi expert consultations. Following the retrieval of valid data, reliability and validity tests were performed alongside data aggregation procedures, thereby laying the empirical groundwork for subsequent analysis.

4.3.1 Sample selection

4.3.1.1 Sample selection of hospital dynamic capabilities

Grounding the analysis in the theoretical premise that public hospitals' dynamic capabilities can be aggregated from those of their clinical departments, and to ensure depth and operationalizability in measurement, this study drills down to clinical departments as the unit of analysis. Using a rigorous sampling framework and scientifically developed measurement tools, it systematically measures the dynamic capabilities of clinical departments within the case hospital.

This study uses clinical departments as the basic unit of analysis. According to publicly available information from the case hospital, it has a total of 55 specialized departments. Based on standard medical function classification, 16 auxiliary or technical departments (e.g., imaging, laboratory, and pharmacy departments) were first excluded, resulting in a final

sampling framework of 48 clinical departments.

To ensure that the sample comprehensively reflected the structural characteristics and internal heterogeneity of the hospital's clinical operations, a stratified sampling method (Cochran, 1977) was employed within this framework. Stratification considered multiple factors, including department scale (number of beds and staff), specialty area (e.g., internal medicine, surgery, specialized clinics), and operational function. From this, 30 clinical departments were selected as the study sample.

This sample size constitutes 62.5% of the sampling framework, meeting the methodological guideline in social science research that a sampling proportion should generally exceed 60% to ensure representativeness (Babbie, 2020). The selected sample thus provides a solid foundation for subsequent measurement and analysis by reflecting the structural characteristics and internal heterogeneity of the hospital's clinical operations.

4.3.1.2 Sample selection of hospital brand equity

Building on the preceding theoretical discussion which characterizes hospital brand equity as having a composite structure whose formation relies on the synergistic contributions of clinical departments, this study also conducts the measurement of brand equity at the clinical department level. This approach enables a systematic analysis of the internal composition and operational mechanisms of hospital brand equity.

Regarding the measurement subjects, the study maintains the same set of 30 clinical departments established earlier as the sample for measuring hospital brand equity. This ensures consistency in the unit of analysis between the two core constructs, hospital dynamic capabilities and hospital brand equity, thereby providing a comparable empirical basis for subsequent investigation into their interrelationship.

On this basis, the specific measurement of brand equity for each clinical department is further defined with respect to its target patient population. As the direct recipients of medical services and the primary perceivers of brand value, patients' evaluations of the case hospital and its departments serve as the most valid empirical indicator for assessing brand equity.

4.3.2 Measurement implementation

4.3.2.1 Measurement implementation of hospital dynamic capabilities

The measurement was conducted between September and October 2025. The measurement tool used was the Public Hospital Dynamic Capabilities Measurement Questionnaire (Version 2.0), developed through a literature review and two rounds of Delphi expert consultation. This questionnaire measures three primary capability dimensions—perception, learning, and integration—comprising 12 second-level indicators and 35 third-level measurement indicators.

The questionnaire was distributed to the heads of the 30 sampled clinical departments. As the core decision-makers and operators of their departments, these individuals possess comprehensive and in-depth knowledge of departmental operations regarding environmental sensing, organizational learning, and resource integration, which helps ensure the validity of the responses.

Responses were recorded on a five-point Likert scale and evaluated by the respondents based on the actual situation of each department. All the 30 distributed questionnaires were returned and deemed valid. After collection, the data were entered and cleaned using SPSS software and subsequently subjected to reliability and validity tests, confirming that the data quality met the requirements for subsequent aggregate analysis and hypothesis testing.

4.3.2.2 Measurement implementation of hospital brand equity

The measurement of brand equity was conducted concurrently via questionnaire survey across the sampled clinical departments from September to October 2025.

The measurement tool used was the Public Hospital Brand Equity Measurement Questionnaire (Version 2.0), developed through literature review and Delphi expert consultation. This scale covers four first-level indicators including brand loyalty, brand quality, brand associations, and brand awareness, 12 second-level and 43 third-level indicators.

The questionnaire survey was administered at the level of the 30 clinical departments. Uniformly trained investigators visited the inpatient wards of these departments and, using a random sampling method, surveyed patients from these departments. Responses were recorded on a five-point Likert scale based on the patients' actual healthcare experiences.

A target of 55 questionnaires was set for each of the 30 clinical departments, resulting in

a total distribution of 1,650 questionnaires. Following collection, the questionnaires underwent on-site verification and logical checks. Invalid responses including incomplete questionnaires, those with obvious logical inconsistencies, or showing patterned responses were excluded. Ultimately, 1,500 valid questionnaires were retained, yielding an overall valid response rate of 90.9%.

After collection, the data were entered and cleaned using SPSS software. Their reliability and structural validity were assessed through reliability analysis, validity tests, and exploratory factor analysis. Individual patient ratings were then aggregated to form a department-level brand equity score for each clinical department, providing an empirical basis for subsequent analysis.

4.4 Case study method: evidence triangulation

Case study research can be traced to social science research in the late 19th century. Pauline V. Young, an American sociologist and research methodologist, defined it in her work Scientific Social Surveys and Research as “a comprehensive study of a social unit—be it a person, group, institution, area, or community”. This definition has since been widely cited in textbooks and papers on social science methodology, and has become one of the classic definitions of the method (Young, 1956).

In the development of contemporary methodology, Case Study Research: Design and Methods by Yin systematically elaborates on the scientific design, data sources, and validity assurance of case studies, and has become a classic guide to this research method (Yin, 2018).

The method focuses on both the holistic context of a case and interpretations at the detailed level. Widely used in domains including law, medicine, education, and business, it enables researchers to explore the intersections of theory and practice in authentic contexts (Petrina, 2019).

Triangulation theory was systematically proposed and elaborated by Denzin in his 1978 book The Research Act: A Theoretical Introduction to Sociological Methods. He defined the theory as “integrating multiple methods or data sources when researching the same phenomenon to enhance the credibility of research conclusions”, and further categorized it into four types: data triangulation, investigator triangulation, theory triangulation, and methodological triangulation. Since then, this theory has become a significant

methodological foundation for qualitative research, mixed-methods research, and cross-disciplinary verification in social sciences (Denzin, 1978).

Based on quantitative analysis, this study adopts the case study research by performing an in-depth analysis of a single representative sample. Then, it complements the multiple regression analysis for hypothesis testing discussed earlier to achieve “triangulation”, which serves to strengthen the validity and real-world explanatory power of the findings.

Methodologically, this study employs the case study research for three key reasons.

First, its core focus is to identify the specific mechanisms and pathways whereby public hospitals boost brand equity via dynamic capability building, as well as to clarify the inherent logic and causes underpinning this process.

Second, public hospitals, as the research subjects, operate within a distinctive institutional environment and policy constraints, and the cultivation of their dynamic capabilities and brand equity is highly context-dependent and path-specific. In-depth analysis of typical cases selected via theoretical sampling can effectively present contextual nuances and dynamic processes that are difficult to capture with quantitative research, thus uncovering the underlying logic of causal links among variables.

Finally, the case selection prioritizes both typicality and heuristic significance. By conducting thorough investigations of information-rich and typical cases, the study seeks to extract generally applicable patterns and mechanisms, thereby providing theoretical refinement and empirical validation for quantitative findings.

4.4.1 Case background

Guangdong Second People’s Hospital (here after abbreviated as “GD2 General Hospital”) is chosen as the empirical case in this study. Its distinctive development path and strategic practices provide a typical research context for exploring the relationship between dynamic capabilities and brand equity of public hospitals.

Founded in 1947, GD2 General Hospital is a Grade A Tertiary general hospital directly affiliated to the Health Commission of Guangdong Province, with its location in Haizhu District, Guangzhou, Guangdong. It undertakes the mandates of the National Emergency Medical Rescue Team (Guangdong) and the International Emergency Medical Team (certified by WHO) at the same time.

Amid the deepening reform of the medical and health system, the hospital has transformed from an enterprise hospital into a provincial public hospital, set the strategic

goal of developing a modern, research-oriented, high-level hospital, and ultimately completed its transition from a traditional medical institution to a modern, high-level hospital. In this process, it has proactively adapted to shifts in policy and market contexts, concentrated on frontier medical domains, and gradually built a discipline brand system characterized by smart medicine, emergency medicine, and disciplinary innovation via the introduction, R&D, and application of new technologies.

In terms of discipline construction, the hospital boasts several national key clinical specialties, including orthopedics, gynecology, and medical imaging, as well as 17 provincial key clinical specialties such as cardiology, neurology, respiratory medicine, and psychiatry, and has established a multidisciplinary collaborative diagnosis and treatment model. By establishing medical alliances, the hospital has achieved the downward allocation of high-quality medical resources and strengthened its regional influence.

Regarding the development of its medical service system, the hospital set up China's inaugural online hospital in 2014, pioneering the innovative application of "Internet+Healthcare". In 2021, it collaborated with Huawei to build a full-scenario smart hospital, advancing the digital transformation of its medical service model. As a provincial emergency hospital, it performs the duties of the National Emergency Medical Rescue Team and serves as a key player in addressing public health emergencies.

With regard to innovative initiatives, the hospital has established research platforms like the Medical Artificial Intelligence Research Center, committing itself to innovative explorations integrating medicine and engineering. In recent years, it has conducted health promotion via a converged media platform, developed a dedicated team for medical science popularization and a comprehensive medical communication system, and gained a favorable reputation and strong brand image in the emerging field of internet healthcare.

The above practical exploration experience provides a valuable observation sample for investigating how public hospitals achieve innovative development in a changing environment, and also lays an empirical foundation for an in-depth analysis of the relationship between dynamic capabilities and brand equity.

4.4.2 Rationale for case selection

This study selects GD2 General Hospital, a Grade A tertiary provincial public hospital located in Guangzhou, Guangdong Province, as the empirical case, based primarily on a careful consideration of the following four aspects.

First, the hospital is chosen for its representative role in the industry's transformation and development. GD2 General Hospital, a large Grade A tertiary Hospital directly affiliated to the Health Commission of Guangdong Province, has its development trajectory deeply rooted in the macro context of the new medical reform and Healthy China Strategy. The hospital has successfully transformed from a facility with only 400 beds and merely four departments (Internal Medicine, Surgery, Pediatrics, and Obstetrics and Gynecology) into a large Grade A Tertiary General Hospital, achieving several-fold growth in key indicators such as bed capacity, department count, and operating revenue.

At present, the hospital operates 2,300 available beds, has 55 specialized disciplines, and employs a total of 3,395 people, forming a modern hospital framework integrating clinical care, teaching, and scientific research. Its evolution reflects the typical path of public hospitals pursuing development by virtue of dynamic capabilities under the dual impetus of policy and market, making it an ideal sample for this study to examine dynamic capability practices.

Second, the selection is based on its pioneering role and exploratory initiatives in dynamic capability construction. GD2 General Hospital has conducted a series of foresighted practices in such domains as smart hospital development, "Internet+Healthcare", and "Artificial Intelligence+Healthcare Management". For instance, it has successively built China's first online hospital and the country's first full-scenario smart hospital, and taken the lead in launching innovative services, including the "AI-driven Comprehensive Health Management Platform" and the "Proactive Health AI Large Model".

These initiatives are a concentrated reflection of the hospital's dynamic capabilities in three dimensions: perceiving policies, market environments, and patient demands (sensing capability); continuously learning and introducing new knowledge and technologies (learning capability); and integrating internal and external resources to innovate service models (integrative capability). They provide abundant practical materials for this study to observe the three dimensions of dynamic capabilities.

Third, the selection is based on the distinctiveness and observability of its brand equity enhancement. Over the past decade, through a series of strategic innovations and developments, including the establishment of emergency hospitals, internet hospitals, and smart hospitals, GD2 General Hospital has achieved a remarkable upgrade in its brand image.

It has been awarded the titles of "National Demonstration Hospital for Medical Services

Improvement", "Advanced Collective in COVID-19 Prevention and Control Work of the National Health System", and "Key High-level Hospitals in Guangdong Province".

It was approved as a National Emergency Medical Rescue Team in 2013, and became part of the China International Emergency Medical Team in 2017 after passing the assessment by the WHO expert group. With outstanding performance in emergency response to public health crises (such as the Wenchuan Earthquake relief and COVID-19 pandemic), the hospital has fostered deeply entrenched public brand associations of "emergency hospital"and "smart hospital", all pointing to a marked improvement in its brand loyalty and recognition. This distinct brand development path offers a robust logical foundation for testing the causal link between dynamic capabilities and brand equity.

Finally, the selection is based on the accessibility and richness of research data. As a dynamic provincial public hospital, the hospital offers open, systematic, and rich secondary data, ranging from official website publications, annual reports, news reports, academic articles, to policy documents. This not only provides a solid data foundation for the in-depth conduct of the case study, but also creates favorable conditions for the acquisition of primary data that may be involved in subsequent stages, including in-depth interviews and internal document reviews, thereby effectively guaranteeing the depth and reliability of this study.

4.4.3 Case data collection and analysis methods

In line with case study protocol (Yin, 2018), the study employs diverse evidence sources to establish evidence triangulation. It aims to achieve mutual verification from varied angles, which serves to notably improve the construct validity and reliability of the study.

Data collection encompasses three source categories. First is archival records, which mainly include the hospital's annual reports, internal work reviews, official website information, relevant media reports, published academic research findings, as well as relevant policy documents issued at national and local levels. These materials form the basic background and factual basis of the study.

Second is observations. Through on-site or online approaches, the study records and analyzes directly observable objects such as the hospital's service workflows, information system user interfaces, physical space layouts,and signage, so as to capture the actual status of its organizational operations and patient experiences.

Third is interviews. Where feasible, semi-structured, in-depth interviews are intended to be carried out with the hospital's senior management team (e.g., hospital executives and

heads of functional divisions) as well as directors of pertinent clinical departments. This seeks to move beyond textual materials and surface-level observations, and to delve into the strategic motivations underpinning decisions, the practical challenges faced during capability development, and the tangible outcomes of measure implementation.

During the data analysis phase, this study intends to mainly adopt the analytical strategies of pattern matching and explanatory building. Through systematic comparison and validation between the key events, decision-making processes, and implementation effects identified in the case, and the literature-based theoretical framework (three dimensions of dynamic capabilities driving four dimensions of brand equity), the study seeks to propose an empirically underpinned theoretical interpretation of two core questions: “how dynamic capabilities of public hospitals drive brand equity” and “in what manner”.

4.4.4 Case study implementation process

To further verify the functional relationship between dynamic capabilities and brand equity identified in the quantitative research, this study adopts the case study method to conduct an empirical analysis of GD2 General Hospital. By collecting evidence and conducting cross-verification at various internal levels of the hospital, it explores in depth the mechanism underlying the relationship between dynamic capabilities and brand equity in public hospitals.

Guided strictly by the theory-driven principle, the case study builds on the findings of the preliminary quantitative analysis and centers on the following core questions. First, it explores the overall mechanism and specific realization paths through which the dynamic capabilities of public hospitals drive brand equity. Second, it analyzes the internal mechanisms and foundational conditions under which integrative capability (X3) exerts a significant impact on all dimensions of brand equity. Third, it explores the boundary conditions of sensing capability (X1) as well as the profound causes behind its particular influence on brand loyalty (Y1).

Furthermore, it investigates the constraining factors underlying the lack of a direct significant effect of learning capability (X2) and its possible indirect functional pathways. To systematically analyze the core proposition that “dynamic capabilities drive brand equity”, this study adopts the evidence triangulation strategy. By means of cross-validation and supplementation across diverse data sources such as archival records, interviews, and observations, it seeks to furnish ample empirical support, procedural interpretations, and

theoretical refinement for the results derived from the quantitative study.

The case data collection for this study was conducted intensively from October to November 2025. Evidence was systematically gathered through diversified channels to construct a complete chain of evidence.

Specifically, data collection was mainly carried out through three approaches. First, archival records were systematically collected, including the hospital's internal documents over the past five years (2021-2025), such as annual work reports, departmental management systems, and medical service process specifications, as well as media reports on hospital development, academic research literature, and relevant policy documents.

Second, field observations and documentation were carried out. On-site inspections covered the hospital's outpatient workflows, practical application interfaces of the smart hospital system, and the operational status of the Multidisciplinary Treatment (MDT) model, generating comprehensive observational notes.

Third, semi-structured interviews were conducted. Via purposive sampling, 8 key informants were selected, including the hospital's responsible vice presidents, heads of core functional departments, and directors of clinical departments, for in-depth interviews. These interview topics closely focused on the construction process of the hospital's dynamic capabilities and their impact mechanisms on brand equity.

Through the systematic, multi-source data collection and follow-up processing described above, this study has built an evidence system characterized by cross-verification and hierarchical richness, thus laying a solid empirical foundation for an in-depth analysis of the operational mechanism linking dynamic capabilities and brand equity.

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Chapter 5: Results

5.1 Results of scale reliability and validity testing

This study employed quantitative methods to examine the reliability and validity of the measurement tool for public hospital dynamic capabilities (X) and brand equity (Y), and to investigate the relationships between the variables through correlation and regression analyses. The statistical procedures consisted of four main stages. First, the internal consistency and reliability of the scales were assessed using Cronbach's α coefficient. Second, exploratory factor analysis (EFA) was conducted to evaluate structural validity, with the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's test of sphericity used to confirm the adequacy of the data for factor analysis. Third, Pearson correlation coefficients were calculated to examine the linear associations between the dimensions of X and Y. Finally, a multiple linear regression model was constructed to systematically test the influence of the various dynamic capability dimensions on brand equity. This analytical framework was designed to ensure the scientific rigor of the measurement tools and the reliability of the findings.

5.1.1 Reliability test

To ensure the stability and internal consistency of the measurement scales, Cronbach's α coefficient was employed to assess the reliability of the two core constructs—hospital dynamic capabilities and hospital brand equity—along with their respective dimensions. The results indicated that the scales developed and utilized in this study demonstrated high reliability.

Specifically, the Hospital Dynamic Capabilities (X) Scale comprises 35 items, with a Cronbach's α coefficient of 0.780. This value, which exceeds the acceptable threshold of 0.7, indicates good internal consistency, strong homogeneity among its items, and reliable, stable measurement results (Table 5.1).

Table 5.1 Reliability analysis of variable X

Variable	Cronbach's Alpha	Number of terms
X	.780	35

The Hospital Dynamic Capabilities (Y) Scale comprises 43 items, with a Cronbach's α

coefficient of 0.955. This value, which exceeds the acceptable threshold of 0.7, indicates excellent internal consistency. It suggests that the scale's item design is sound and that it accurately measures the intended constructs, yielding highly reliable results (Table 5.2).

Table 5.2 Reliability analysis of variable Y

Variable	Cronbach's Alpha	Number of terms
Y	0.955	43

5.1.2 Validity test

Structural validity was examined using exploratory factor analysis. The results are as follows.

The KMO measure of sample adequacy was 0.991, far exceeding the recommended threshold of 0.8, indicating that the data were highly suitable for factor analysis with substantial shared variance among variables and fully meeting the prerequisites for validity assessment. Bartlett's test of sphericity yielded an approximate χ^2 value of 91,065.071 with a significance level of 0.000 (df=903, p<0.001), rejecting the null hypothesis of variable independence. This confirms that the correlation matrix is not an identity matrix. This result provides essential support for subsequent correlation analysis and multiple regression analysis between variables (Table 5.3).

Table 5.3 KMO measure of sampling adequacy and Bartlett's test of sphericity

KMO Measure of Sampling Adequacy		.991
Bartlett's Test of Sphericity	Approx. Chi-Square	91065.071
	df	903
	p	.000

5.2 Results of testing relationships between variables

5.2.1 Correlation analysis

To initially examine the direction and strength of associations among the variables, a correlation analysis between hospital dynamic capabilities X and hospital brand equity Y was first performed.

The results revealed significant positive correlations between hospital dynamic capabilities X (and its dimensions X1, X2, X3) and hospital brand equity Y (and its dimensions Y1, Y2, Y3, Y4).

Specifically, the correlation coefficients between X and Y (across their four respective dimensions) ranged from 0.498 to 0.520, all significant at the 0.01 level. Similarly, the correlations between dimensions X1, X2, X3 and Y (across its four dimensions) fell between

0.367 and 0.458, each reaching a significance level of 0.05.

These results indicate a consistently positive relationship between X (along with its dimensions) and Y (along with its dimensions), thereby providing a foundation for subsequent regression analysis and offering preliminary support for the hypothesized associations among the variables (Table 5.4).

Table 5.4 Correlation analysis between variable X and variable Y

		X	X1	X2	X3
Y	Pearson Correlation	.511**	.377*	.384*	.447*
	Sig.	0.004	0.04	0.036	0.013
Y1	Pearson correlation	.512**	.386*	.376*	.458*
	Sig.	0.004	0.035	0.04	0.011
Y2	Pearson correlation	.520**	.374*	.398*	.450*
	Sig.	0.003	0.042	0.029	0.013
Y3	Pearson correlation	.507**	.375*	.378*	.447*
	Sig.	0.004	0.041	0.039	0.013
Y4	Pearson correlation	.498**	.367*	.376*	.428*
	Sig.	0.005	0.046	0.041	0.018

* The correlation is significant at the 0.01 level (two-tailed).
* The correlation is significant at the 0.05 level (two-tailed).

5.2.2 Multiple regression analysis

After confirming significant correlations among the variables, this study conducted a multiple linear regression analysis to further test the hypotheses and investigate the influence of hospital dynamic capabilities on hospital brand equity.

First, a regression model was developed with hospital dynamic capabilities as the predictive variable and hospital brand equity as the dependent variable to test its main effect.

The model yielded an R of 0.511, an R^2 of 0.262, and an adjusted R^2 of 0.235.

This indicates that the dynamic capability X alone accounted for 23.5% of the variance in hospital brand equity Y. While the explanatory power of this model is lower than that of the multi-variable regression model, it nevertheless demonstrates a moderate effect.The standard error of estimate was 0.670, which falls within an acceptable range, suggesting that the model provides stable predictions for hospital brand equity Y (Table 5.5).

Table 5.5 Goodness-of-fit for the simple linear regression of [Y] on [X]

R	R^2	Adjusted R^2	Standard Error of the Estimate
.511a	.262	.235	.669516383924416

Note.a. Predictors: (Constant), X

The regression equation yielded an F value of 9.917 with a significance level of 0.004 (p<0.01), which is well below the significance level of 0.01. This result indicates that the model as a whole was statistically significant, leading to the rejection of the null hypothesis

that the coefficient of X is zero. This demonstrates a significant linear predictive relationship of X on Y, confirming the validity of the single-variable regression model (Table 5.6).

Table 5.6 Analysis of variance (ANOVA) for the simple linear regression of [Y] on [X]

Model	Sum of Squares	df	Mean Square	F	*p*
Regression	4.445	1	4.445	9.917	.004b
Residual	12.551	28	.448		

Note.a. Dependent Variable: [Y]
b. Predictors: (Constant), [X]

The regression coefficient of independent variable X is 1.503, the standardized Beta coefficient is 0.511, the t-value is 3.149, and the significance level is 0.004 (p<0.01). This indicates that X has a significant positive predictive effect on Y, meaning that for every unit increase in X, Y increases by an average of 1.503 units, and this predictive relationship has high statistical reliability (Table 5.7).

Table 5.7 Coefficients for the simple linear regression of [Y] on [X]

Predictors	Unstandardized Coefficients		Standardized Coefficients	t	*p*
	B	Standard Error	Beta		
(Constant)	-1.748	1.675		-1.043	.306
X	1.503	.477	.511	3.149	.004

Note.a. Dependent Variable: [Y]

Second, at the dimensional level, to uncover the specific underlying mechanisms, this study performed regression analyses with the dimensions of hospital dynamic capabilities (X1, X2, X3) as the predictive variable and hospital brand equity (Y) as the dependent variable.

The results indicated an adjusted R^2 of 0.340, meaning that the three independent variables (X1, X2, X3) collectively explained 34.0% of the variance in Y, representing a moderate level of explanatory power. The standard error of estimate was 0.622, suggesting relatively low prediction error and good overall predictive accuracy for Y (Table 5.8).

Table 5.8 Goodness-of-fit for the multiple regression of [Y] on [X1], [X2], and [X3]

R	R^2	Adjusted R^2	Standard Error of the Estimate
.639a	.408	.340	.622177979440091

Note.a. Predictors: (Constant), X1, X2, X3

The regression equation yielded an F value of 5.969 with a significance level of 0.003 (p<0.01), which is well below the conventional 0.05 threshold. The model as a whole is statistically significant. This leads to the rejection of the null hypothesis that all predictive variable coefficients are zero, confirming that the combined predictive effect of X1, X2, and X3 on Y is reliable and that the regression model is valid (Table 5.9).

Table 5.9 Analysis of variance (ANOVA) for the multiple regression of [Y] on [X1], [X2], and [X3]

Model	Sum of Squares	df	Mean Square	F	*p*
Regression	6.932	3	2.311	5.969	.003b
Residual	10.065	26	.387		

Note.a. Dependent Variable: Y
b. Predictive Variables: (Constant), X1, X2, X3

The regression coefficient of X1 is 0.732, the standardized Beta coefficient is 0.355, the t-value is 2.042, and the significance level is 0.051 (p>0.05). Its predictive effect on Y is close to the significant level, and further analysis of its potential impact is needed in conjunction with the actual research background.

The regression coefficient of X2 is 0.242, the standardized Beta coefficient is 0.165, the t-value is 0.948, and the significance level is 0.352 (p>0.05). Its predictive effect on Y is not significant, indicating that after controlling other variables, the impact of X2 on Y is relatively small.

The regression coefficient of X3 is 2.690, the standardized Beta coefficient is 0.471, the t-value is 3.041, and the significance level is 0.005 (p<0.01). It has a significant positive predictive effect on Y, and the standardized Beta coefficient is the highest, making it the variable with the strongest predictive power for Y among the three independent variables (Table 5.10).

Table 5.10 Coefficients for the multiple regression of [Y] on [X1], [X2], and [X3]

Predictors	Unstandardized Coefficients		Standardized Coefficients	t	*p*
	B	Standard Error	Beta		
(Constant)	-9.309	3.372		-2.761	.010
X1	.732	.358	.355	2.042	.051
X2	.242	.255	.165	.948	.352
X3	2.690	.885	.471	3.041	.005

Finally, at the dimensional-relationship level, to systematically uncover more nuanced pathways between hospital dynamic capabilities and brand equity, this study further estimated a series of regression models. Each model used the three dimensions of dynamic capability (X1, X2, X3) as predictive variables and the four dimensions of brand equity (Y1, Y2, Y3, Y4) as the dependent variables, allowing for a fine-grained, cross-dimensional examination.

The micro-level mechanisms among dimensions were tested through the following four regression analyses.

First, the joint predictive effect of X1, X2, and X3 on Y1 was examined.

The model yielded an R of 0.650, an R^2 of 0.422, and an adjusted R^2 of 0.355, indicating that the three predictive variables together explained 35.5% of the variance in Y1—a

moderate level of explanatory power. The standard error of estimate was 0.637, reflecting relatively low prediction error (Table 5.11).

Table 5.11 Goodness-of-fit for the multiple regression of [Y1] on [X1], [X2], and [X3]

R	R^2	Adjusted R^2	Standard Error of the Estimate
.650a	.422	.355	.637366269894210

Note.a. Predictors: (Constant), X1, X2, X3

The regression equation yielded an F value of 6.330 with a significance level of 0.002 (p<0.01). This result indicates that the model as a whole was statistically significant. The joint prediction effect of X1, X2, and X3 on Y1 is significant and the model is valid (Table 5.12).

Table 5.12 Analysis of variance (ANOVA) for the multiple regression of [Y1] on [X1], [X2], and [X3]

Model	Sum of Squares	df	Mean Square	F	*p*
Regression	7.715	3	2.572	6.330	.002b
Residual	10.562	26	.406		

Note.a. Dependent Variable: Y1

b. Predictive Variables: (Constant), X1, X2, X3

The regression coefficient of X1 is 0.799, the standardized Beta coefficient is 0.375, the t-value is 2.179, and the significance level is 0.039 (p<0.05), indicating a significant positive predictive effect on Y1; The regression coefficient of X2 is 0.224, the standardized Beta coefficient is 0.147, the t-value is 0.855, and the significance level is 0.400 (p>0.05), indicating no significant predictive effect on Y1; The regression coefficient of X3 is 2.876, the standardized Beta coefficient is 0.485, the t-value is 3.174, and the significance level is 0.004 (p<0.01). It has a significant positive predictive effect on Y1 and the strongest predictive power (Table 5.13).

Table 5.13 Coefficients for the multiple regression of [Y1] on [X1], [X2], and [X3]

Predictors	Unstandardized Coefficients		Standardized Coefficients	t	*p*
	B	Standard Error	Beta		
(Constant)	-10.148	3.454		-2.938	.007
X1	.799	.367	.375	2.179	.039
X2	.224	.262	.147	.855	.400
X3	2.876	.906	.485	3.174	.004

Note.a. Dependent Variable: Y1

Second, the joint predictive effect of X1, X2, and X3 on Y2 was examined.

The model produced an R of 0.642, an R^2 of 0.413, and an adjusted R^2 of 0.345, indicating that the three predictive variables collectively explained 34.5% of the variance in Y2—a moderate level of explanatory power. The standard error of estimate was 0.643, reflecting relatively low prediction error (Table 5.14).

Table 5.14 Goodness-of-fit for the multiple regression of [Y2] on [X1], [X2], and [X3]

R	R^2	Adjusted R^2	Standard Error of the Estimate
.642a	.413	.345	.642952653107824

Note.a. Predictors: (Constant), X1, X2, X3

The regression equation yielded an F value of 6.089 with a significance level of 0.003 (p<0.01). This result indicates that the model as a whole was significant, confirming the reliable joint predictive effect of the three predictive variables (X1, X2, X3) on Y2 (Table 5.15).

Table 5.15 Analysis of variance (ANOVA) for the multiple regression of [Y2] on [X1], [X2], and [X3]

Model	Sum of Squares	df	Mean Square	F	*p*
Regression	7.552	3	2.517	6.089	.003b
Residual	10.748	26	.413		

Note.a. Dependent Variable: Y2

b. Predictive Variables: (Constant), X1, X2, X3

The regression coefficient of X1 is 0.730, the standardized Beta coefficient is 0.342, the t-value is 1.973, and the significance level is 0.059 (p>0.05), indicating a nearly significant predictive effect on Y2; The regression coefficient of X2 is 0.283, the standardized Beta coefficient is 0.186, the t-value is 1.074, and the significance level is 0.293 (p>0.05), indicating no significant predictive effect; The regression coefficient of X3 is 2.781, the standardized Beta coefficient is 0.469, the t-value is 3.042, and the significance level is 0.005 (p<0.01). It has a significant positive predictive effect on Y2 and the strongest predictive power (Table 5.16).

Table 5.16 Coefficients for the multiple regression of [Y2] on [X1], [X2], and [X3]

Predictors	Unstandardized Coefficients		Standardized Coefficients	t	*p*
	B	Standard Error	Beta		
(Constant)	-9.699	3.484		-2.783	.010
X1	.730	.370	.342	1.973	.059
X2	.283	.264	.186	1.074	.293
X3	2.781	.914	.469	3.042	.005

Note.a. Dependent Variable: Y2

Third, the joint predictive effect of X1, X2, and X3 on Y3 was examined.

The model yielded an R of 0.636, an R^2 of 0.404, and an adjusted R^2 of 0.335, indicating that the three predictive variables collectively explained 33.5% of the variance in Y3—a moderate level of explanatory power. The standard error of estimate was 0.640, reflecting relatively low prediction error (Table 5.17).

Table 5.17 Goodness-of-fit for the multiple regression of [Y3] on [X1], [X2], and [X3]

R	R^2	Adjusted R^2	Standard Error of the Estimate
.636a	.404	.335	.639719371139803

Note.a. Predictors: (Constant), X1, X2, X3

The regression equation yielded an F value of 5.878 with a significance level of 0.003 (p<0.01). This result indicates that the model as a whole was significant, confirming the reliable joint predictive effect of the three predictive variables (X1, X2, X3) on Y3 (Table 5.18).

Table 5.18 Analysis of variance (ANOVA) for the multiple regression of [Y3] on [X1], [X2], and [X3]

Model	Sum of Squares	df	Mean Square	F	*p*
Regression	7.217	3	2.406	5.878	.003b
Residual	10.640	26	.409		

Note.a. Dependent Variable: Y3

b. Predictive Variables: (Constant), X1, X2, X3

The regression coefficient of X1 is 0.752, the standardized Beta coefficient is 0.356, the t-value is 2.041, and the significance level is 0.051 (p>0.05), indicating a nearly significant predictive effect on Y3; The regression coefficient of X2 is 0.239, the standardized Beta coefficient is 0.159, the t-value is 0.912, and the significance level is 0.370 (p>0.05), indicating no significant predictive effect; The regression coefficient of X3 is 2.757, the standardized Beta coefficient is 0.471, the t-value is 3.032, and the significance level is 0.005 (p<0.01). It has a significant positive predictive effect on Y3 and the strongest predictive power (Table 5.19).

Table 5.19 Coefficients for the multiple regression of [Y3] on [X1], [X2], and [X3]

Predictors	Unstandardized Coefficients		Standardized Coefficients	t	*p*
	B	Standard Error	Beta		
(Constant)	-9.580	3.467		-2.763	.010
X1	.752	.368	.356	2.041	.051
X2	.239	.263	.159	.912	.370
X3	2.757	.909	.471	3.032	.005

Note.a. Dependent Variable: Y3

Fourth, the joint predictive effect of X1, X2, and X3 on Y4 was examined.

The model yielded an R of 0.617, an R^2 of 0.380, and an adjusted R^2 of 0.309, indicating that the three predictive variables collectively explained 30.9% of the variance in Y4—a moderate level of explanatory power. The standard error of estimate was 0.586, reflecting relatively low prediction error (Table 5.20).

Table 5.20 Goodness-of-fit for the multiple regression of [Y4] on [X1], [X2], and [X3]

R	R^2	Adjusted R^2	Standard Error of the Estimate
.617a	.380	.309	.585831675282078

Note.a. Predictors: (Constant), X1, X2, X3

The regression equation yielded an F value of 5.319 with a significance level of 0.005 (p<0.01). This result indicates that the model as a whole was significant, confirming the

reliable joint predictive effect of the three predictive variables (X1, X2, X3) on Y4 (Table 5.21).

Table 5.21 Analysis of variance (ANOVA) for the multiple regression of [Y4] on [X1], [X2], and [X3]

Model	Sum of Squares	df	Mean Square	F	*p*
Regression	5.477	3	1.826	5.319	.005b
Residual	8.923	26	.343		

Note.a. Dependent Variable: Y4

b. Predictive Variables: (Constant), X1, X2, X3

The regression coefficient of X1 is 0.649, the standardized Beta coefficient is 0.342, the t-value is 1.924, and the significance level is 0.065 (p>0.05), indicating a nearly significant predictive effect on Y4; The regression coefficient of X2 is 0.224, the standardized Beta coefficient is 0.166, the t-value is 0.931, and the significance level is 0.361 (p>0.05), indicating no significant predictive effect; The regression coefficient of X3 is 2.365, the standardized Beta coefficient is 0.450, the t-value is 2.840, and the significance level is 0.009 (p<0.01). It has a significant positive predictive effect on Y4 and the strongest predictive power (Table 5.22).

Table 5.22 Coefficients for the multiple regression of [Y4] on [X1], [X2], and [X3]

Predictors	Unstandardized Coefficients		Standardized Coefficients	t	*p*
	B	Standard Error	Beta		
(Constant)	-7.895	3.175		-2.487	.020
X1	.649	.337	.342	1.924	.065
X2	.224	.240	.166	.931	.361
X3	2.365	.833	.450	2.840	.009

Note.a. Dependent Variable: Y4

5.3 Results of hypothesis testing

Based on the validated scale data, this study employed multiple linear regression analysis to examine the hypothesized relationship between public hospital dynamic capabilities and public hospital brand equity.

5.3.1 Overall hypothesis

To investigate the overall relationship between hospital dynamic capabilities (X) and brand equity (Y), a regression analysis was first conducted between these two constructs.

H0: Hospital dynamic capabilities (X) have a significant positive effect on hospital brand equity (Y).

Results: The regression coefficient of X is 1.503, the standardized Beta coefficient is 0.511, the t-value is 3.149, and the significance level is 0.004 (p<0.01), indicating that X has a significant positive predictive effect on Y.

Analysis: The data analysis supports H0.

The findings indicate that the dynamic capabilities of public hospitals, namely, the abilities to sense, learn, integrate, and reconfigure, positively influence their brand equity by enabling the hospitals to attain sustainable competitive advantages. This mechanism aligns with the theoretical deduction that dynamic capabilities serve as a source of value for brand equity. Accordingly, the core proposition of this study, that public hospitals' dynamic capabilities are positively correlated with their brand equity, is empirically supported.

Conclusion: H0 is supported.

The results indicate that the dynamic capability of public hospitals is an important driving factor for their brand equity, and there is a significant positive correlation between the two. This discovery validates the core theoretical proposition of this study as a whole, laying the foundation for further analysis of the specific mechanisms of action between various dimensions.

5.3.2 Specific hypotheses

Building on the theoretical framework outlined above, this study formulated the following 12 specific hypotheses to systematically examine the relationships between the dimensions of public hospitals' dynamic capabilities (X1, X2, X3) and those of brand equity (Y1, Y2, Y3, Y4).

First, the hypotheses regarding the effect of sensing capability (X1) on each dimension of brand equity were tested.

H1: A hospital's sensing capability (X1) has a significant positive effect on brand loyalty (Y1).

Results: The regression coefficient of X1 is 0.799, the standardized Beta coefficient is 0.375, the t-value is 2.179, and the significance level is 0.039 (p<0.05), showing that X1 has a significant positive predictive effect on Y1.

Analysis: The data support H1.

This finding suggests that a hospital's capacity to keenly perceive patient needs and policy trends can be effectively translated into initiatives that enhance patient loyalty. These initiatives foster trust and dependence, thereby increasing patients' willingness to return and

actively recommend the hospital. This positive influence is statistically significant: for every one-standard-deviation increase in sensing capability, brand loyalty is expected to increase by 0.375 standard deviations.

Conclusion: H1 is supported.

H2: A hospital's sensing capability (X1) has a significant positive effect on brand quality (Y2).

Results: the regression coefficient of X1 is 0.730, the standardized Beta coefficient is 0.342, the t-value is 1.973, and the significance level is 0.059 (p>0.05), indicating that X1 has a nearly significant predictive effect on Y2.

Analysis: The data do not support H2.

However, its significance level (p=0.059) is close to the cutoff and the coefficient is positive, suggesting a trend toward a beneficial relationship between sensing capability and brand quality. This borderline result may reflect limited sample size or influence from unmeasured variables.

Conclusion: H2 is not supported.

H3: A hospital's sensing capability (X1) has a significant positive effect on brand associations (Y3).

Results: The regression coefficient of X1 is 0.752, the standardized Beta coefficient is 0.356, the t-value is 2.041, and the significance level is 0.051 (p>0.05), indicating that X1 showed a positive association with Y3 that approached statistical significance.

Analysis: Similar to H2, the result is at the borderline of significance (p=0 .051).

The data suggest that sensing capability may contribute to shaping a positive brand image, but this influence did not meet the threshold for statistical significance. This pattern implies that the effect could be indirect or may require specific contextual conditions to be clearly observed.

Conclusion: H3 is not supported.

H4: A hospital's sensing capability (X1) has a significant positive effect on brand awareness (Y4).

Results: The regression coefficient of X1 is 0.649, the standardized Beta coefficient is 0.342, the t-value is 1.924, and the significance level is 0.065 (p>0.05), indicating that X1 showed a positive association with Y4 that approached statistical significance.

Analysis: the data do not support H4.

Although the regression coefficient is positive, the p-value exceeds 0.05, indicating that the direct effect of sensing capability on brand awareness is not statistically significant in the current model. Building awareness may depend more on active communication efforts than on sensing alone.

Conclusion: H4 is not supported.

Second, the hypotheses regarding the effect of learning capability (X2) on each dimension of brand equity were examined.

H5: A hospital's learning capability (X2) has a significant positive effect on brand loyalty (Y1).

Results: the regression coefficient of X2 is 0.224, the standardized Beta coefficient is 0.147, the t-value is 0.855, and the significance level is 0.400 (p>0.05), indicating that X2 has no significant predictive effect on Y1.

Analysis: The data do not support H5.

The small and non-significant regression coefficient suggests that learning capability lacks a direct influence on brand loyalty. Its effect may be realized indirectly through mediating variables such as improved quality of care or operational efficiency, implying a possible lag in its impact.

Conclusion: H5 is not supported.

H6: A hospital's learning ability (X2) has a significant positive impact on brand quality (Y2).

Results: The regression coefficient of X2 is 0.283, the standardized Beta coefficient is 0.186, the t-value is 1.074, and the significance level is 0.293 (p>0.05), indicating that X2 shows no significant predictive effect on Y2.

Analysis: The data do not support H6.

The results did not demonstrate a direct effect of learning capability on quality perception. Technical learning and knowledge updates may first need to be translated into optimized clinical pathways or enhanced service standards before they become perceptible to patients, indicating a non-direct pathway of influence.

Conclusion: H6 is not supported.

H7: A hospital's learning ability (X2) has a significant positive impact on brand association (Y3).

Results: the regression coefficient of X2 is 0.239, the standardized Beta coefficient is 0.159, the t-value is 0.912, and the significance is 0.370 (p>0.05), showing that X3 has no significant predictive effect on Y3.

Analysis: The data do not support H7.

A hospital's academic reputation and research strength did not show a statistically significant effect on forming "academic excellence" associations in the public mind. The public may prioritize direct service experiences over background academic activities.

Conclusion: H7 is not supported.

H8: A hospital's learning ability (X2) has a significant positive impact on brand awareness (Y4).

Results: the regression coefficient of X2 is 0.224, the standardized Beta coefficient is 0.166, the t-value is 0.931, and the significance level is 0.361 (p>0.05), showing that X2 has no significant predictive effect on Y4.

Analysis: The data do not support H8.

The anticipated effect of academic achievements serving as a "signal" to raise public awareness was not observed. Media coverage may focus more on social news rather than specialized research outputs, which likely limits their broader promotion.

Conclusion: H8 is not supported.

Finally, the hypotheses regarding the effect of integrative capability (X3) on each dimension of brand equity were examined.

H9: A hospital's integrative capability (X3) has a significant positive effect on brand loyalty (Y1).

Results: the regression coefficient of X3 is 2.876, the standardized Beta coefficient is 0.485, the t-value is 3.174, and the significance is 0.004 (p<0.01), representing a significant positive effect and the strongest influence on Y1.

Analysis: The data strongly support H9.

Integrative capability demonstrated the strongest and most statistically significant positive effect (p<0.01). This indicates that optimizing service processes and achieving efficient coordination represent the most direct and effective pathways to building patient loyalty.

Conclusion: H9 is supported.

H10: A hospital's integrative capability (X3) has a significant positive impact on brand quality (Y2).

Results: the regression coefficient of X3 is 2.781, the standardized Beta coefficient is 0.469, the t-value is 3.042, and the significance level is 0.005 (p<0.01), representing a significant positive effect and the strongest influence on Y1.

Analysis: The data strongly support H10.

Integrating resources to reduce errors and improve efficiency directly enhances patients' perception of service quality, demonstrating a substantial and significant impact.

Conclusion: H10 is supported.

H11: A hospital's integrative capability (X3) has a significant positive impact on brand association (Y3).

Results: the regression coefficient of X3 is 2.757, the standard Beta coefficient is 0.471, the t-value is 3.032, and the significance level is 0.005 (p<0.01), showing a significant positive impact and strong influence on Y3.

Analysis: The data strongly support H11.

Internally excellent coordination and management capabilities can effectively project a brand image of being "reliable, professional, and trustworthy," thereby fostering strong positive associations.

Conclusion: H11 is supported.

H12: A hospital's integrative capability (X3) has a significant positive impact on brand awareness (Y4).

Results: The regression coefficient of X3 is 2.365, the standardized Beta coefficient is 0.450, the t-value is 2.840, and the significance level is 0.009 (p<0.01), showing a significant positive predictive effect and the strongest predictive power on Y4.

Analysis: the data strongly support H12.

The favorable reputation resulting from efficient operations serves as the most effective driver of brand awareness, with its effect being both statistically significant and consistently observed.

Conclusion: H12 is supported.

Based on the empirical results of the dimension-level hypotheses, the outcomes of the 12 specific hypotheses proposed in this study have been clarified.

Overall, five hypotheses were significantly supported by the data (p<0.05). Among these, integrative capability (X3) was supported across all four dimensions of brand equity (H9, H10, H11, H12), demonstrating its comprehensive and robust driving effect on brand loyalty, brand quality, brand associations, and brand awareness.

In addition, the hypothesis (H1) that sensing capability (X1) has a significant positive effect on brand loyalty (Y1) was also supported. However, seven hypotheses were not supported by the data (p>0.05). These include the hypotheses regarding the effect of sensing capability (X1) on brand quality (Y2), brand associations (Y3), and brand awareness (Y4) (H2, H3, H4), as well as the hypotheses concerning the effect of learning capability (X2) on all four dimensions of brand equity (Y1 to Y4) (H5, H6, H7, H8).

Notably, learning capability (X2) did not demonstrate a significant direct effect on any dimension of brand equity in this study, suggesting that its influence may be exerted through more complex indirect or mediated pathways.

In summary, through systematic empirical testing, this study has examined the driving relationship between public hospitals' dynamic capabilities and brand equity at both the overall and sub-dimension levels.

At the overall level, the regression results indicate a significant positive correlation between hospital dynamic capabilities and brand equity, supporting the core theoretical proposition.

At the dimensional level, the testing of the 12 specific hypotheses reveals differential patterns: integrative capability exhibited a significant positive effect on all four dimensions of brand equity, demonstrating its core driving role; sensing capability showed a significant effect only on brand loyalty, indicating a more specific scope of influence; whereas learning capability did not demonstrate a direct significant effect on any dimension, suggesting a more complex pathway of influence.

These findings not only confirm the foundational role of dynamic capabilities in driving brand equity, but also offer empirical support for understanding the distinct mechanisms associated with each capability dimension. This lays a theoretical groundwork for developing subsequent management strategies (Figure 5.1).

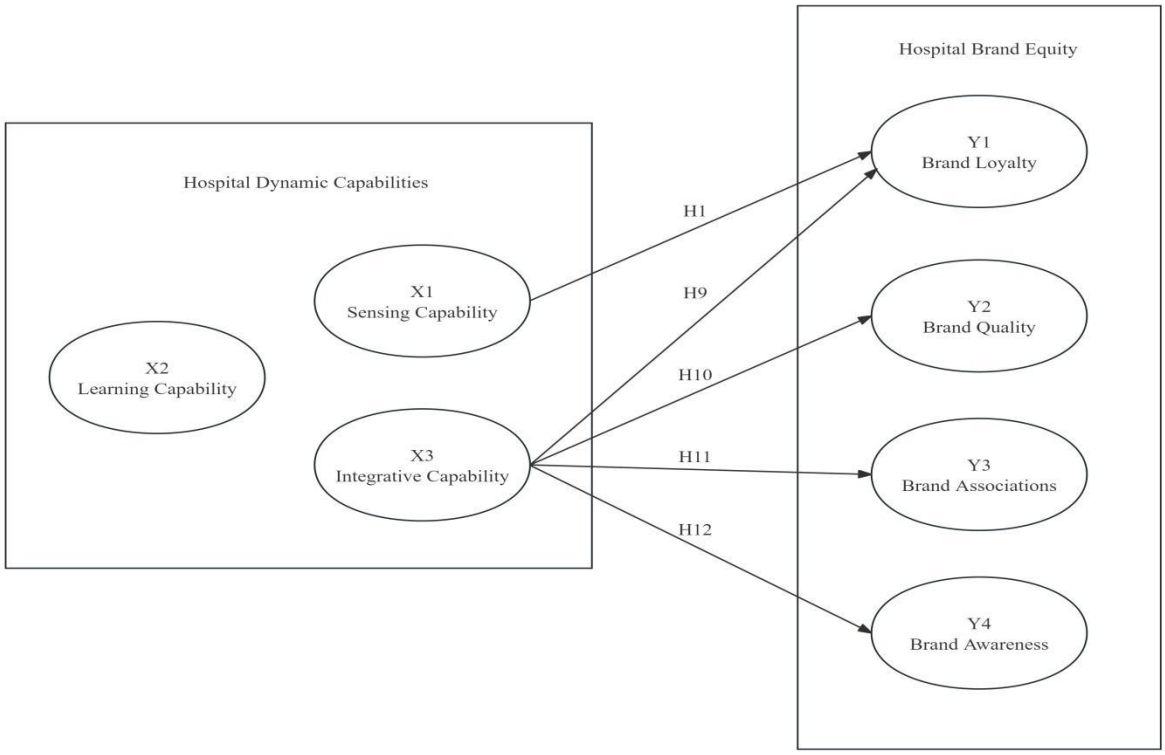


Figure 5.1 Relationship between dynamic capabilities and brand equity in public hospitals

5.4 Results of case study

Based on the aforementioned implementation process of the case study, this research further explores the mechanism underlying the relationship between dynamic capabilities and brand equity through the systematic analysis of the collected archival records, on-site observations, and semi-structured interviews.

The case analysis focuses on the core issues proposed in the theory-driven principle and adopts the evidence triangulation strategy for cross-validation, so as to reveal how the case hospital, against the backdrop of a dynamic environment, drives the formation and enhancement of hospital brand equity (including brand loyalty Y1, brand quality Y2, brand association Y3, and brand awareness Y4) through its hospital sensing capability (X1), hospital learning capability (X2), and hospital integrative capability (X3).

This section first outlines the overall functioning mechanism through which dynamic capabilities drive brand equity, then analyzes the specific impact paths and internal logic of each capability dimension, respectively, and finally summarizes the core findings of the case study.

5.4.1 Overall mechanism of dynamic capabilities driving brand equity

First, through the analysis of internal archival data and interview data of the case hospital, this study finds that the hospital's dynamic capabilities (X) drive the accumulation of hospital brand equity (Y) via acyclic mechanism of "environmental sensing—resource integration—strategic restructuring".

Specifically, when responding to the reform of the medical and health system and changes in market demand, the case hospital demonstrated a high level of dynamic adaptability: by sensing external policy and technological trends (e.g., the development of smart healthcare), the hospital initiated internal learning and innovation processes, and ultimately achieved service upgrading and brand enhancement through resource integration.

This mechanism has formed a clear implementation path in the hospital's transformation practice: first, sensing capability helps the hospital identify opportunities and threats (e.g., the rise of internet healthcare); second, learning capability supports the hospital in absorbing new knowledge and adjusting internal processes; finally, integrative capability converts scattered resources into synergistic advantages, thereby enhancing brand equity.

Specifically, as evidenced by archival documents, the hospital repeatedly highlighted the concept of "innovation-driven development" in its annual work reports from 2021 to 2025. In particular, the 2024 report stated that it would "vigorously advance the innovation-driven development strategies for medical groups, proactive health management, and health products" and "deeply integrate medical technologies with new technologies and new media".

During field observations, the researchers further verified this pathway: in outpatient services and MDT, the hospital leveraged its smart hospital system (e.g., the full-scenario intelligent platform developed in collaboration with Huawei) to optimize service processes. The smart pharmacy reduced the average patient waiting time for medicine collection to less than 5 minutes, and bedside settlement shortened the discharge procedure to 1 minute. These improvements enhanced service efficiency and patient experience, thereby strengthening the hospital's brand awareness and loyalty.

The interview data also support this mechanism. A vice president in charge stated in the interview, "Our brand was not built overnight; instead, it has been gradually constructed through continuous trend sensing, learning, and innovation, and resource integration. For instance, the establishment of the online hospital was a brand breakthrough achieved by integrating technical resources and service teams after we sensed the development trend of

the internet."

Overall, the development course of the case hospital reflects that dynamic capabilities drive the multi-dimensional enhancement of brand equity through a closed-loop mechanism of "sensing-learning-integrating". This mechanism not only explains the positive relationship between dynamic capabilities and brand equity identified in the quantitative research, but also reveals the inherent path for public hospitals to achieve sustainable brand development in a changing environment (thus verifying H0).

5.4.2 Core path of influence of integrative capability

Second, this study confirms the impact mechanisms and enabling foundations through which hospital integrative capability (X3) exerts effects on all dimensions of hospital brand equity (Y1, Y2, Y3, Y4).

Within the case hospital, hospital integrative capability (X3) exerts a notable influence on every dimension of hospital brand equity, with its functioning mechanism primarily embodied in resource synergy and process optimization.

Through the review of archival records and the analysis of interviews, this study finds that the integrating capability (X3) of the case hospital has effectively enhanced brand loyalty (Y1), brand quality (Y2), and brand association (Y3) based on three core pillars: cross-departmental collaboration, technology integration, and service innovation.

First, in terms of resource synergy, by integrating internal disciplinary resources and external partners, the case hospital has established the MDT model and medical consortia, which have effectively improved patients' medical experience and satisfaction, thereby enhancing brand awareness, and patient trust. For example, archival records indicate that the hospital has integrated and adjusted the operations of national and provincial key clinical departments such as orthopedics, medical imaging, neuroscience center, and cardiology, developing a disciplinary brand system of "building disciplinary clusters and nurturing subspecialties". As a clinical department director noted in an interview, "Integrative capability allows us to break down inter-departmental barriers and provide one-stop services via the MDT model. Patients gain higher satisfaction and also develop greater identification with the hospital brand."

Second, in terms of technology integration, the case hospital collaborated with Huawei to build a full-scenario smart hospital, integrating artificial intelligence with medical services, which has improved service efficiency and enhanced the brand image (Tian, 2024). Field

observations further indicated that the hospital's intelligent system streamlined registration and clinical procedures, thus reducing patient waiting periods. Specifically, the average hospital admission waiting time was shortened by over 1.5 days, and the average outpatient waiting time was reduced to 1 hour (Hu et al., 2025), effectively improving brand loyalty.

Finally, in terms of service innovation, the hospital has built an integrated media platform to establish a health communication system and carry out continuous health science education. According to public records, the hospital's 2025 Ten Priority Work Plan explicitly states "cultivating a team of internet-famous medical professionals in science popularization and consistently delivering high-quality health science content" (Zhu, 2025).

In the past two years, the case hospital has built a professional team of science popularization experts and lecturers covering 54 disciplines with a total of 164 members. More than 170 medical staff from 50 clinical departments have opened over 190 personal new media accounts, forming a multi-channel and high-frequency supply system of science popularization knowledge. It has consistently delivered high-quality health science content (Cai & Chen, 2023; Tan, 2024), garnered favorable public praise, and boosted its brand awareness (Y4).

During the interview, a head of a functional division noted, "Integrative capability is the core driving force of brand equity. It enables us to transform scattered innovation points into overall brand advantages. For example, the evolution of the online hospital from a pilot program into a national benchmark is the result of resource integration."

The implementation foundation of the hospital's integrative capability (X3) lies in the organizational structure and cultural support of the case hospital. As can be seen from the hospital's archival records, the hospital has established a multi-level management mechanism and a cross-departmental collaboration model, which provides institutional guarantee for resource integration. Meanwhile, interview data show that the hospital's leadership emphasizes a culture of "collaborative innovation". The hospital has issued the Work Regulations on Hospital Culture Construction, set up a leading group for culture construction and a subordinate office for culture construction work, thus enabling the integrative capability to continuously act on brand equity.

This finding aligns with the notable influence of integrative capability (X3) on every dimension of brand equity demonstrated in the quantitative study, and further clarifies its inherent mechanism: integrative capability directly enhances the multi-dimensional performance of brand equity by optimizing resource allocation and service delivery.

5.4.3 Boundary of effect of sensing capability

Third, through quantitative data analysis and empirical research, this study reveals the functional boundary of hospital sensing capability (X1) and its specific impact on hospital brand loyalty (Y1).

Sensing capability (X1) has demonstrated a clear functional boundary in the case hospital, which is mainly focused on the accurate identification of patients' demand pain points, the keen interpretation of changes in the policy environment, and the forward-looking judgment of industry development trends, and exerts a specific impact on brand loyalty (Y1).

Through interview and archival analysis, this study finds that sensing capability (X1) directly enhances the patients' and public loyalty through the dual pathways of "rapid response to external changes"and "crisis management", yet its effect is constrained by organizational inertia and resource constraints.

Specifically, the sensing capability (X1) of the case hospital is reflected in its keen insight into policy orientations, technological trends, and emergent incidents. As evidenced by archival data, after the outbreak of COVID-19 in 2020, the hospital quickly sensed the emergency response needs of the public health system, promptly strengthened the functions of emergency medical rescue, and expanded service boundaries by relying on the internet hospital platform. Relevant measures were reported by *CCTV News* (Sun, 2020).

In addition, the hospital's successful treatment cases of a 101-year-old senior patient and young pediatric patients during the pandemic (Xinhua News Agency, 2022) were also extensively covered by authoritative media outlets such as Xinhua News Agency and People's Daily, demonstrating its professional medical standards and humanistic care.

This series of rapid response measures not only shaped the hospital's professional image in public health crises, but also strengthened patients' professional trust and emotional identification with the hospital by continuously providing safe and reliable medical services, thereby laying a solid foundation for cultivating long-term patient dependence and brand loyalty. A vice president confirmed in the interview, "Sensing capability (X1) enabled us to seize the initiative in emergent incidents. For example, the operations of the National Emergency Medical Rescue Team have fostered a high level of trust among patients and communities toward the hospital, which constitutes the source of brand loyalty."

However, the functional boundary of sensing capability has also become evident: interview data indicate that when the policy environment changes too drastically, or internal resources are insufficient, sensing capability may not be directly translated into actions,

thereby limiting its impact on other dimensions of brand equity (e.g., brand awareness Y4). For instance, some directors of clinical departments pointed out, “Although we can perceive the trends of new technologies, we are constrained by budgetary and talent shortages, making it difficult to implement them immediately, which has hindered the comprehensive enhancement of brand awareness (Y4).”

In addition, field observations support the specific impact of sensing capability (X1) on brand loyalty (Y1): within emergency care settings, the hospital’s rapid response and information disclosure (e.g., real-time updates on diagnosis and treatment progress via the integrated media platform) have significantly enhanced patients’ trust and reliance. Interview data further reveal the functional pathway of this mechanism—patients regard the hospital’s rapid sensing and transparent communication as the core embodiment of “reliability and responsiveness”, thereby strengthening their loyalty.

As a director of the emergency department stated in the interview, “In public emergencies, what patients need most is certainty and timely responses. When we can sense changes in the situation immediately and take the initiative to release authoritative information via multiple channels, patients’ trust in the hospital will be significantly enhanced, and such trust will be directly translated into their long-term choice of medical treatment.”

This finding explains the significant impact of sensing capability (X1) on brand loyalty (Y1) identified in the quantitative research, while clarifying its functional boundary: sensing capability (X1) is a core driver of brand loyalty (Y1), yet it needs to be coordinated with other capabilities to achieve the comprehensive enhancement of brand equity.

5.4.4 Constraining factors of learning capability

Finally, this study also identifies the indirect functional pathways and restrictive factors of hospital learning capability (X2).

During the research on the case hospital, learning capability (X2) did not demonstrate a direct and significant impact on brand equity, but it supported the overall mechanism of dynamic capabilities through indirect pathways. The results of the case analysis reveal the indirect functional pathways and main restrictive factors of learning capability (X2), including organizational structure rigidity and uneven resource allocation.

According to interviews and archival records, learning capability (X2) is reflected in knowledge absorption, training systems, and experimental innovation in the case hospital.

For instance, the hospital has established a medical artificial intelligence research center and regularly organizes training sessions and academic exchanges for medical staff to facilitate the integration of medicine and engineering for innovation. As a head of the oncology department noted in an interview, “Learning capability enables us to stay at the technological forefront, yet it usually needs to be converted into brand value through integrative capability. For example, the AI technologies we have acquired must be integrated into clinical workflows to enhance brand awareness.”

Field observations have also documented the indirect role of learning capability: in MDT, continuous learning activities have improved the professional competence and collaboration level of the medical team, thereby indirectly enhancing the hospital’s service quality.

Archival records further show that after learning from the operational experience of online hospitals, the hospital upgraded service models such as nurse home visits and drug delivery, forming a more competitive patient treatment pathway (Lin & Li, 2019). This learning-based innovation of service models has improved patients’ recognition and emotional association with the hospital, thereby exerting a positive cumulative effect on brand equity.

However, the restrictive factors of learning capability have significantly weakened its direct influence. Interview data indicate that the hospital’s organizational structure exhibits a certain degree of rigidity, and some departments are accustomed to traditional working models, which hinders the rapid application of new knowledge. Meanwhile, uneven resource allocation (e.g., the disconnect between scientific research investment and clinical needs) makes it difficult to popularize learning outcomes.

A head of a functional division elaborated, “Learning capability itself is of great importance, but it is restricted by work inertia within the system. Without integrative capability as a bridge, learning often remains at the theoretical level and can’t directly enhance the brand.” This finding is consistent with the result of the quantitative research that learning capability does not exert a direct and significant impact, and further clarifies its indirect functional pathway: learning capability contributes to brand equity indirectly, mainly by enhancing sensing capability and integrative capability, while its direct effect is constrained by internal organizational factors.

To sum up, the findings of this case study systematically clarify the functional mechanism linking dynamic capabilities and brand equity in the case hospital: integrative capability serves as the core driver, directly boosting all dimensions of brand equity; sensing

capability reinforces brand loyalty within defined boundaries; while learning capability underpins the overall dynamic capabilities via indirect routes.

These findings not only verify the results of the quantitative research, but also clarify the functional boundaries and synergistic relationship of each capability dimension empirically, which provides support for the further application of the dynamic capability theory in the field of healthcare management and points out specific directions for hospital administrators to optimize brand strategies. The triangulation of case evidence ensures the reliability and validity of the analysis, laying a solid foundation for the in-depth discussion of the theoretical contributions and management implications of this study in subsequent research.

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Chapter 6: Discussion of Results

6.1 Discussion

This study draws on the dynamic capabilities theory and brand equity theory to address six central questions: (1) How should the dynamic capabilities of Grade A tertiary public hospitals in China be defined? (2) How should the brand equity of Grade A tertiary public hospitals in China be defined? (3) What are the dimensions for measuring the dynamic capabilities of Grade A tertiary public hospitals in China? (4) What are the dimensions for measuring the brand equity of Grade A tertiary public hospitals in China? (5) What is the influence mechanism of dynamic capabilities on brand equity in large Grade A tertiary public hospitals? (6) What are the key factors affecting the impact of hospital dynamic capabilities on hospital brand equity? To answer these questions, the study developed a theoretical model and a set of research hypotheses regarding the relationship between dynamic capabilities and brand equity of public hospitals, designed the Scale for Public Hospitals' Dynamic Capabilities and Brand Equity, and tested the framework systematically through questionnaire surveys and case studies. This chapter will focus on the empirical results to deeply analyze their internal logic and management implications.

6.1.1 Confirmation of the overall relationship between dynamic capabilities and brand equity

The correlation analysis and regression analysis in this study confirm that the overall dynamic capabilities of public hospitals exert a significant positive driving effect on their brand equity (H0 was supported).

This conclusion verifies the core viewpoint of theoretical deduction: in a rapidly changing medical environment, hospitals can more effectively allocate resources, optimize service processes, and respond to changes in policy and market demands through systematic sensing, learning, integration, and reconfiguration capabilities, thereby continuously enhancing their brand image and value in patients' minds (brand equity).

As noted earlier by Castelo et al. (2023), dynamic capabilities seem to be particularly relevant to the public sector because they focus on internal resources. The dynamic

capabilities framework facilitates public organizations in implementing strategies. This result also confirms that the application of dynamic capabilities theory has been successfully extended from the field of corporate strategic management to the context of non-profit-oriented public hospitals. It proves that in the highly professional and policy-influenced field of healthcare, an organization's ability to adapt to environmental changes through systematic sensing, learning, integration, and reconfiguration is also a driving source to obtain sustainable competitive advantages and shape an excellent brand image.

This conclusion also resonates with the perspective of Chen et al. (2017), who argue that hospital dynamic capabilities should manifest in the timely acquisition and rational allocation of medical resources, as well as the cultivation of brand intangible equity. Building on this foundation, the present study further narrows its focus: not only is brand equity clearly defined as a measurable multidimensional construct, but the differentiated impact pathways of various dimensions of dynamic capabilities on each dimension of brand equity are also systematically examined through empirical methods.

This echoes the core assertion emphasized by Teece (2007) that "dynamic capabilities are the key to an organization's long-term competitiveness" and provides empirical evidence from Chinese public hospitals for this assertion.

6.1.2 Core driving role of integrative capability

This study tested 12 specific hypotheses regarding the relationships between each dimension of public hospitals' dynamic capabilities and each dimension of brand equity, revealing the differentiated mechanism through which each dimension of dynamic capabilities acts on brand equity. This is one of the most important findings in this research.

Hospital integrative capability (X3) exhibited a strong and significant driving effect on all four dimensions of brand equity (H9–H12 were supported), indicating that the integrative capability has a robust positive impact on brand loyalty, perceived quality, brand associations, and brand awareness. This confirms Teece's (2007) emphasis that integration and reconfiguration capabilities represent the final critical step in realizing the value of dynamic capabilities.

As noted by Eisenhardt and Martin (2000), dynamic capabilities represent the processes through which organizations integrate, reconfigure, acquire, and release resources to align with or create changes in the market. The findings of this study further concretize the

manifestation of this process in the context of public hospitals: integrative capability serves as the core mechanism enabling hospitals to rapidly reconfigure internal and external resources—such as inter-departmental collaboration, process optimization, and technological integration—in response to dynamic environmental shifts. This observation aligns with the perspective of Zott (2003), who argues that dynamic capabilities allow organizations to restructure resources in the shortest possible time to build competitive advantages.

Case studies further illustrate that in the context of public hospitals, the integrative capability is reflected in the cross-departmental collaboration (such as the MDT model), the process reengineering (such as day surgery and the "single bed management across the hospital" initiative), and the coordination of medical and service resources. The efficient integration can directly improve the efficiency and reliability of medical services (enhancing brand quality), create unique and consistent patient experiences (shaping brand associations), and build reputation through successful treatment of complex cases and high-efficiency operations (strengthening brand awareness and loyalty).

In case interviews, the deputy dean in charge of medical affairs described the "stroke center green channel", while the deputy dean responsible for brand culture construction explained efforts to "integrate media resources and build a consistent external brand communication system". These accounts provide vivid practical illustrations of the aforementioned statistical significance, further proving that the integrative capability serves as the key bridge connecting a hospital's internal capabilities and external brand value.

6.1.3 Specificity of the boundary of sensing capability's effect

The verification results of the 12 hypotheses proposed in this study reveal that each dimension of dynamic capability presents a differentiated mechanism of action on brand equity. The sensing capability (X1) only has a significant positive impact on the brand loyalty (Y1) (H1 was supported), while its impacts on brand quality, brand associations, and brand awareness failed to pass the significance test (H2–H4 were not supported).

This finding aligns with Lu's (2020) assertion that "effectively sensing environmental changes is a critical foundation for public hospitals to achieve sustained service advantages", while further specifying its pathway of influence: acute sensing enhances service responsiveness, which in turn elevates patient satisfaction and ultimately drives the formation of loyalty. This mechanism is inherently consistent with the process revealed by Hussain et al. (2025), in which service outcomes and satisfaction positively affect loyalty.

This result shows the specificity of the mechanism through which the sensing capability acts. The sensing capability enables hospitals to keenly perceive changes in patient needs and market trends, thereby making rapid responses and personalized service adjustments. The experience of "being understood and valued" directly affects patients' emotional attachment and willingness to seek medical treatment repeatedly (brand loyalty).

It is evident that public hospitals' acute awareness of the external environment and patient needs first adds value by deepening ties with core patient groups. This assessment is also consistent with the trend in recent scholarship toward deepening this line of inquiry. A growing number of scholars argue that hospital brand loyalty represents not merely a behavioral pattern of patients repeatedly choosing a particular hospital, but rather a long-term relationship grounded in trust, satisfaction, and emotional attachment (Górska-Warsewicz, 2022; Kim et al., 2021).

However, the impact of such perception based on in-depth interaction may be more implicit and relational. To establish extensive external brand quality (Y2), distinct brand associations (Y3), and brand awareness (Y4), it is necessary to realize transformation through subsequent integration actions. This reveals the path characteristics of sensing capability's effect, which is "from inside to outside" and "from depth to breadth".

In addition, patients' evaluations of brand quality (Y2), brand associations (Y3), and brand awareness (Y4) may be more dependent on long-term, stable, and visible service outputs and tangible evidence (which is more reliant on integrative capability). The impact of merely having keen sensing capability without accompanying efficient internal integration is limited.

6.1.4 Complexity of the influence pathway of learning capability

The verification results of the 12 hypotheses in this study reveal that learning capability (X2) did not exhibit a direct significant impact on any dimension of the brand equity (H5–H8 were not supported).

This finding seems to contradict theoretical expectations, but it does not mean that the learning capability is unimportant; instead, it reveals the indirectness and complexity of its influence path. As Zollo and Winter (2002) observed, learning capability emerges from the co-evolution of implicit experience accumulation, explicit knowledge articulation, and codification activities, and its value is often realized through processes of knowledge integration and transformation within the organization.

Case interviews indicate that within hospital organizations, the learning capability may serve as a foundational competence, and its value can only be achieved through the integrative capability as a “transformer”. The new knowledge and skills acquired by hospitals through training, knowledge management, and other means cannot directly drive patient-perceivable brand equity unless they are effectively integrated into daily workflows, diagnosis and treatment protocols, and service design.

This result suggests that the future research can further focus on the internal mechanism of interaction among the dimensions of hospital dynamic capabilities. For example, whether hospital dynamic capabilities indirectly affect the hospital brand equity through the mediating role of integrative capability, rather than examining their direct impacts in isolation. In terms of management practice, greater attention should also be paid to how to build a bridge from “learning” to “integrated application”.

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Chapter 7: Conclusions of Results

7.1 Conclusions

Focusing on the six research questions proposed, this study draws the following conclusions through systematic theoretical construction and empirical testing.

First, regarding the theoretical definition and dimensions of dynamic capabilities in China's Grade A Tertiary public hospitals. This study defines hospital dynamic capabilities as follows: the capability of public hospitals to support their sustainable development by promptly sensing environmental changes, rapidly learning and acquiring information matching the external environment, applying theoretical knowledge and technical skills, continuously adapting to changes, re-planning and integrating existing resources, providing high-quality and efficient medical services, and meeting the public health needs. Its core dimensions include hospital sensing capability, hospital learning capability, and hospital integrative capability.

Second, regarding the definition and measurement dimensions of brand equity in China's Grade A Tertiary public hospitals. This study defines public hospital brand equity as an intangible asset composed of elements such as medical technology, service quality, management efficiency, patient trust, and social responsibility, which is accumulated through differentiated identification and continuous value creation in the process of providing medical and health services; it is the cognitive and emotional connection formed by patients and the public based on the aforementioned elements, as well as the evaluation result formed by government departments based on these elements. Its measurement dimensions include hospital brand loyalty, hospital brand quality, hospital brand associations, and hospital brand awareness.

Finally, as the core conclusion of this study, it concerns the influence mechanism and key functional pathways of dynamic capabilities on brand equity. The empirical results show that the dynamic capabilities of public hospitals are important driving factors for their brand equity, and there is a significant positive correlation between the two, yet the influence mechanism presents clearly differentiated pathways.

Specifically, integrative capability serves as a direct and core driving force, exerting a

comprehensive and significant positive impact on all four dimensions of brand equity. The influence of sensing capability demonstrates a specific boundary effect, with its role mainly concentrated on the enhancement of brand loyalty. As of now, no direct pathway of learning capability has been found to exert an influence; whether an indirect pathway does exist still remains to be confirmed by subsequent studies. In summary, among the components of dynamic capabilities, integrative capability is the most critical factor affecting and shaping hospital brand equity.

As Teece, the founding scholar of dynamic capabilities, stated, “moving beyond the next big thing: managing intangible equity through dynamic capabilities.” The innovation of this research lies precisely in systematically introducing the dynamic capability theory and brand equity theory, which originated from corporate strategic management, into the unique organizational field of Chinese public hospitals characterized by distinct public welfare attributes and strong institutional constraints. Brand equity, as an important intangible asset for enterprises, is equally a key intangible capital for public organizations like hospitals to achieve sustainable development.

Therefore, exploring the influence mechanism of dynamic capabilities on brand equity in public hospitals holds significant theoretical and practical importance for enhancing their core competitiveness and social value.

This study has independently developed and rigorously validated a set of measurement indicators, scales, and questionnaires for assessing dynamic capabilities and brand equity in public hospitals, thereby providing a standardized measurement toolkit for hospital management. The development of this tool also integrates national policy orientations, practical realities of hospital administration, and genuine patient experiences, ensuring both policy relevance and practical applicability. It is anticipated that this toolkit will facilitate the transition of hospital management from experiential decision-making to evidence-based governance.

In summary, this study has not only theoretically revealed the relationship and mechanisms between dynamic capabilities and brand equity in public hospitals but has also developed a set of scientific and practical research tools and models, providing a directly referable theoretical framework and practical guide for subsequent academic research and management practice.

7.2 Limitations

Through theoretical construction and empirical testing, this study has systematically explored the functional relationship between the dynamic capabilities and brand equity of public hospitals and obtained a series of valuable research findings.

In terms of sample selection, this study was restricted by the confidentiality of medical data and thus adopted a single-case study design. Meanwhile, the internal validity and theoretical support of the research results were guaranteed by implementing a series of quality control measures, including innovatively integrating national and provincial relevant assessment indicators into scale construction, conducting multiple rounds of Delphi expert consultations to ensure content validity, and carrying out cross-level data collection based on "department-hospital" matching.

Nevertheless, this study still has certain limitations in terms of sample universality, interpretation of the mechanism of action, and comprehensiveness of measurement perspectives. These limitations offer explicit directions for future in-depth research, such as carrying out cross-regional comparative studies, probing into complex mediating and moderating effects, incorporating the perspectives of diverse stakeholders, and adopting new theoretical frameworks and research methods. Sustained and in-depth exploration will facilitate the development of a more systematic and sound theoretical system, laying a solid academic foundation for the high-quality development of public hospitals.

In terms of the research sample and geographic scope, this study chose a Grade A Tertiary provincial public hospital in Guangzhou, Guangdong Province as a single case for thorough analysis, with this research design entailing dual considerations at the methodological level.

On the one hand, the hospital's cutting-edge practices in fields such as smart hospital construction and emergency medicine have provided a sufficient observation window for the development of its dynamic capabilities, and its representativeness and forward-looking nature have offered rich and in-depth empirical materials for this study.

On the other hand, this research design has also fully taken into account the special attributes of the measurement tools. To ensure that the dynamic capability measurement scale conforms to policy orientation and possesses practical value, this study integrated the core indicators of the national performance assessment for Grade A public hospitals,

provincial assessments, and routine medical evaluations into the construction of the indicator system. This design strategy is not only innovative, but also significantly improves the policy adaptability and practical explanatory power of the scale. By adopting standardized and verifiable assessment indicators, it effectively ensures the reliability and comparability of data collection.

Since these indicators involve sensitive information related to the operation and management of medical institutions, cross-institutional data acquisition faces substantial obstacles under the constraints of medical data confidentiality norms. Owing to the objective restrictions on medical data confidentiality, adopting the single-case study method has become a reasonable choice that balances data quality and research depth.

Nevertheless, choosing a single case and a single-region sample, while guaranteeing research depth, also restricts the universality of the study's conclusions.

In addition, it should be pointed out that public hospitals in different regions of China exhibit significant differences in terms of resource endowments, policy implementation intensity, and market competition environment. Therefore, future research can adopt cross-regional and multi-case comparative studies to test the robustness of the theoretical model constructed in this study under different scenarios, and reveal the moderating effect of regional factors and institutional settings in the "capability-brand" relationship, so as to promote the construction of a more universally applicable theoretical framework for public hospital brand management.

In terms of mechanism analysis, this study identified the important phenomenon that learning capability exerts a complex indirect effect on brand equity through empirical analysis, and put forward a preliminary judgment based on theoretical deduction that its value transmission may be realized through key mediating variables such as integrative capability.

However, constrained by the research design and data structure, this mediating mechanism has not yet been verified through standardized statistical testing procedures. This finding suggests that within the theoretical framework of dynamic capabilities, the dimensions are probably characterized by more refined synergistic mechanisms and hierarchical relationships than existing knowledge has revealed.

Specifically, how the environmental signals captured by sensing capability are converted into organizational knowledge stock through learning mechanisms, and then how resource restructuring and value output are achieved via integrative capability. This complete

capability transformation chain still needs to be analyzed through further research design.

It is worth noting that the theoretical model established herein primarily centers on the core operational routes linking dynamic capabilities and brand equity, whereas some contextual factors that might influence this process have not been fully incorporated.

For example, key variables such as the guiding role of hospital strategic leadership and the supporting function of organizational culture may play important moderating roles in this complex system. As promoters of dynamic capability construction and decision-makers of resource allocation, strategic leaders' cognitive models and decision-making preferences may profoundly affect the way organizations interpret the external environment and their response speed; as the soft infrastructure for value creation, organizational culture may regulate the efficiency boundaries of knowledge transformation and resource integration by shaping internal behavioral norms and innovation.

Drawing on the findings of this study, future studies may continue to advance the refinement and extension of the theoretical model. They can further probe into the intrinsic interaction mechanisms across the dimensions of dynamic capabilities and investigate the interrelationships between core variables under varied organizational contexts. Through the development of a more complex theoretical framework, it is promising to uncover the full pathways of dynamic capabilities' impact on brand equity in a more systematic manner, thus enhancing the comprehension of the internal value creation mechanisms within public hospitals.

In addition, it is worth noting that in the highly specialized field of medical services, the value realization of dynamic capabilities may also be affected by factors specific to the healthcare industry. For example, industry-specific variables such as the update cycle of medical technology, the construction mechanism of doctor-patient trust, and the reform of medical insurance payment methods may interact with the dynamic capabilities of hospitals and jointly shape the accumulation path of brand equity. In-depth discussion of these industry-specific factors will further enhance the explanatory power and application value of the theoretical model in the field of healthcare management.

In terms of measurement perspective, this study mainly adopted a patient-perspective evaluation system in terms of brand equity measurement. Although this design is consistent with the theoretical core of "customer-based brand equity", it has certain limitations in comprehensively capturing the multi-dimensional characteristics of public hospital brand equity. As a special type of public good, medical services have their brand equity formation

jointly shaped by diverse stakeholders.

As direct providers of medical services, the medical staff's internal brand identification directly affects service quality and patient experience. The degree to which medical personnel recognize the hospital's values is directly transmitted to patients through diagnosis and treatment behaviors and service attitudes, which becomes a key link in brand image shaping. Meanwhile, as important components of the organization, the hospital administrative staff and logistics support teams' brand cognition is also related to the overall operational efficiency and service quality of the hospital.

Medical staff's internal identification with the hospital brand serves as the cornerstone for shaping the external brand image, while government evaluations are directly related to the hospital's access to resources and policy support, and even play an authoritative guiding role in public perception. The evaluations from these multiple subjects will further form a complete picture of the brand equity of public hospitals.

The current hospital brand equity measurement system, based on the patient perspective, can well reflect the brand cognition at the terminal of medical services, but it has certain limitations in comprehensively capturing the composite value of medical institutions as public service providers.

Future research may consider establishing an integrated measurement framework that integrates multiple internal and external perspectives, and incorporates medical staff's organizational identification, government evaluation indicators, partner satisfaction, and other dimensions into the brand equity assessment system. Such methodological innovation will facilitate the adaptive evolution of brand equity theory within the public service sector, offering more holistic theoretical underpinnings for brand development in public hospitals.

7.3 Research implications

Through a systematic analysis of the relationship between dynamic capabilities and brand equity of public hospitals, it is found that in China's complex healthcare environment, the formation of sustainable competitiveness of the hospitals depends on not only technical strength, but also their capabilities to adapt to changes, integrate resources, create value, and transform these into social trust. Such capabilities are not formed spontaneously, but require deliberate management design and sustained investment.

To transform theoretical insights into practical effectiveness, hospital administrators

should focus on establishing a three-in-one management system featuring sensing—reengineering—transformation, thereby internalizing dynamic capabilities to be the organizational gene and externalizing them to be an excellent brand image.

First, it is necessary to establish a systematic mechanism for environmental sensing and strategic decoding. The foundation of dynamic capabilities lies in acute sensitivity to changes in policies, technologies, and patient demands. It is recommended to establish a strategic development committee led by hospital leadership and composed of key personnel from multiple departments. Its core function is to systematically interpret key information, such as healthcare payment reforms (DRG/DIP), new drug and medical device approvals, and public health policies, on a regular basis (for example, once a quarter), and assess their impact on the hospital operational model, disciplinary layout, and cost structure.

For example, as for the DRG payment reform, the committee should take the lead in decomposing macro-level policies into department-level disease-specific cost accounting and clinical pathway optimization plans, so as to shift from a “passive response” to a “proactive design”. This mechanism ensures that the hospital strategic adjustment is always based on a profound understanding of the institutional environment, and it is a concrete practice of the “sensing and identification” dimension in dynamic capabilities.

Second, it is necessary to promote resource restructuring and process reengineering oriented by clinical value. The core of dynamic capabilities lies in integrating and restructuring internal and external resources to create new value. It is recommended that public hospitals shift the focus of resource investment from scale expansion to value creation, and enhance operational efficiency through the structural reform.

At the operational level, it is necessary promote the integration of service units centered on disease types or patients, break down disciplinary barriers in treating major diseases, establish specialized disease treatment centers.These centers should be granted autonomy in personnel allocation, equipment provision, and performance distribution to achieve integrated diagnosis and treatment and maximized efficiency.

At the technical level, a medical technology innovation and transformation fund should be established to encourage clinical teams to implement technological innovation and process improvement aimed at enhancing therapeutic efficacy, improving patient experience, or reducing costs, and a rapid evaluation and promotion mechanism should be established.

Third, it is necessary to establish a brand narrative and trust-based communication system that facilitates the external transformation of internal capabilities.

Strong brand equity results from social recognition of internal value creation and requires proactive management. Hospital administrators should lead the development of a systematic brand communication strategy, and transform achievements in dynamic capability building (such as new technologies, high efficiency, and quality services) into clear and credible brand narratives.

To be specific, apart from utilizing self-owned platforms such as the hospital's official website and WeChat official account, the hospital should also make full use of the mainstream media to present its practical cases and achievements in discipline development, technological innovation, service optimization, and humanistic care through special columns and series reports.

In addition, clinical experts are encouraged to disseminate authoritative medical knowledge through popular science articles and health lectures, which can help transform technical authority into public trust. During crises or public opinion events, communication contingency plans featuring fact-orientation, rapid response and sincere attitude should be established to safeguard the brand reputation.

This process effectively connects the internal development practices of hospitals with external public perception, and helps achieve the transmission from dynamic capabilities to brand equity. It is found that when hospitals proactively disclose quality and performance information through public platforms, patients' trust in the hospital and their intention to select the hospital will be significantly enhanced (Berwick et al., 2003; Hibbard et al., 2005).

Finally, it is necessary to cultivate an organizational culture that supports innovation and collaboration.

The cultivation of dynamic capabilities and brand equity ultimately relies on people and culture. Hospitals should increase the weighting of dimensions such as innovation contribution, interdisciplinary collaboration, and process optimization in their talent evaluation and promotion systems. Management innovation salons or clinical improvement case competitions should be organized regularly to share outstanding practices and award value creators.

More importantly, hospital administrators must lead by example, demonstrate clear support for continuous improvement and a willingness to embrace trial and error, and foster a safety-based learning culture that empowers healthcare professionals to explore new approaches with confidence and enthusiasm to enhance patient value.

To sum up, the management practices promoting high-quality development of public

hospitals are a systematic project that strategically integrates building of dynamic capabilities and accumulation of brand equity. The administrators should make concerted efforts from four dimensions: establishing perception systems, reshaping value processes, utilizing communication narratives, and nurturing a culture of innovation. In this way, the external pressure can be transformed into endogenous motivation, and the public service mission can be realized with outstanding performance. Ultimately, enduring, hard-to-replicate core competitiveness will be established with social responsibility fulfilled at the same time.

7.4 Future research prospects

Building on the theoretical framework, empirical findings, and limitations of this study, future research could be extended in several directions. First, regarding sampling and data collection, subsequent work could move beyond the single-case design by conducting cross-regional and multi-level comparative studies. For example, comparing tertiary hospitals, specialized hospitals, and even county-level public hospitals in regions with varying economic development (e.g., coastal eastern vs. central-western areas) would help test the external validity of the theoretical model proposed here. Furthermore, employing a longitudinal design to collect panel data on the development of dynamic capabilities and brand equity would allow for a more precise examination of the causal and temporal relationships among the variables.

Future research could further refine the theoretical model by exploring more complex causal mechanisms. The present study found that learning capability did not exert a direct and significant effect on brand equity, suggesting the need to examine its indirect pathways through potential mediators. For instance, a mediation model such as “learning capability → service innovation/medical quality → brand equity” could be constructed and tested to elucidate the underlying processes of knowledge translation and value creation. Additionally, introducing moderating variables such as hospital strategic leadership, level of digitalization, or regional healthcare competition intensity would allow for testing moderated mediation or mediated moderation models. This would further uncover the complex mechanisms through which dynamic capabilities influence brand equity.

Future studies could further explore the use of innovative mixed-methods designs. Beyond traditional surveys and case studies, big-data analytical approaches could be incorporated, for example, applying natural language processing to review patient online evaluations or utilizing

hospital information system data to construct indicators of dynamic capabilities. Experimental designs also merit consideration, such as using scenario-based experiments to examine how varying levels of demonstrated dynamic capabilities influence patients' brand perceptions.

Future research could broaden its theoretical lens by integrating perspectives such as institutional theory and resource orchestration theory. This would allow for a deeper analysis of how public hospitals, under institutional pressures like healthcare payment reforms and tiered diagnosis-and-treatment policies, strategically configure their dynamic capabilities to orchestrate resources and ultimately enhance brand equity. A particularly promising direction would be to investigate, within the context of digital transformation, how hospitals create brand value by integrating digital capabilities with traditional dynamic capabilities.

Finally, the measurement tools developed in this study provide a solid foundation for future research. Moving forward, the scales can undergo cross-sample validation and further refinement across diverse institutional and organizational settings, ultimately establishing a robust and widely applicable measurement system for public hospitals' dynamic capabilities and brand equity. Through sustained inquiry along these avenues, a more systematic and comprehensive theoretical framework can be gradually developed, offering stronger scholarly grounding for understanding the mechanisms underlying the sustainable development of public hospitals in China during their high-quality transformation.

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Annex A: Framework for Hospital Dynamic Capabilities Indicators

First-level indicators	Secondary indicators	Third-level indicators
I-1 Sensing Capability	II-1 Patient NeedsIdentification	III-1 Sub-specialty (Quaternary Specialty) Development Status
		III-2 Establishment of Specialized Disease Clinics
		III-3 Case Mix Breadth (Number of Diagnosis-Related Groups, DRGs)
	II-2 Policy Context Sensing	III-4 Development Status of Key Specialties Designated by the National Health Commission
		III-5 Internal Organizational Structure in Response to Healthcare Security Reforms
		III-6 Internal Organization and Operational Mechanism for Hospital Operations Management
		III-7 Internal Unit Dedicated to Patient Experience Improvement Policies
	II-3 Multidimensional Sensing	III-8 Proportion of AmbulatorySurgeries
		III-9 Coverage Rate of Wards Providing High-Quality Nursing Services
		III-10 Growth Rate of Average Cost per Outpatient Visit▲
		III-11 Growth Rate of Average Cost per Hospitalization▲
I-2 Learning Capability	II-4 Ways/Contents of Knowledge Acquisition	III-12 Number of New Knowledge and Technology Introductions

		III-13 Frequency of Healthcare Staff Participation in Academic Conferences
		III-14 Completion Status of Continuing Medical Education (CME) Credits
	II-5 Learning and Research Funding	III-15 Annual Financial Investment in Learning Resources
		III-16 Research Project Funding per 100 Healthcare Technicians▲
		III-17 Revenue from Research Output Translation per 100 Healthcare Technicians
	II-6 Organizational Learning	III-18 Number of Internal Training Sessions Conducted
		III-19 Quantity and Outcomes of Innovation Projects
	II-7 Learning Effect	III-20 Quantity and Quality of Scientific Research Outputs
		III-21 First-Attempt Pass Rate of the National Medical Licensing Examination for Hospital Resident Physicians▲
	II-8 Human Resources	III-22 New Appointments as Committee Chairs in Medical Societies/Associations over Three Years
		III-23 Change in Proportion of Doctoral Degree Holders among Healthcare Technicians over Three Years
I-3 Integrative Capability	II-9 Quality Safety	III-24 Incidence of Surgical Complications▲
		III-25 Positive Rate of Major Medical Equipment Examinations
	II-10 Technology Level	III-26 Proportion of Grade IV

		Surgeries among Discharged Patients▲
		III-27 Proportion of Revenue from Adjunctive Medications (Change over Three Years)
		III-28 Application Level Classification of Electronic Medical RecordFunctions▲
		III-29 Energy Consumption Expenditure per 10,000 CNY Revenue (Change over Three Years) ▲
	II-11 Service Process	III-30 Average Outpatient Appointment Rate
		III-31 Average Post-Appointment Waiting Time for Outpatients
	II-12 Resource Allocation and Utilization	III-32 Bed Occupancy Rate
		III-33 Daily Average Inpatient Workload per Licensed Physician
		III-34 Physician-to-Nurse Ratio▲
		III-35 Number of Pharmacists per 100 Hospital Beds

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Annex B: Survey Questionnaire on Dynamic Capabilities of Public Hospitals

1. To what extent do the subspecialties within the clinical department cover common and frequently occurring diseases?

□ (1 point) □ (2 points) □ (3 points) □ (4 points) □ (5 points)

1 point:The clinical department has only a few basic specialties, lacking dedicated subspecialty coverage for its common diseases.

2points:Covers some high-incidence common diseases, but subspecialty differentiation is coarse and insufficient for segmented needs (e.g., only a "General Internal Medicine" without subdivisions for cardiology, endocrinology, etc.).

3 points:Basically covers the main common and frequently occurring diseases within the department's scope with corresponding subspecialties, meeting conventional diagnostic and treatment demands.

4 points:Comprehensively covers common and frequent diseases with subspecialties, with some areas further subdivided (e.g., an Endocrinology Department hosting dedicated Diabetes and Thyroid clinics).

5 points:Not only comprehensive coverage of common diseases, but also establishes distinctive subspecialties targeting regionally prevalent diseases (e.g., Thalassemia in southern China).

(Score 0 if no subspecialties are established.)

2. To what extent do the disease-specific clinics within the clinical department cover common and frequently occurring diseases?

□ (1 point) □ (2 points) □ (3 points) □ (4 points) □ (5 points)

1 point:The department operates very few disease-specific clinics for only the most common conditions, covering a minimal range.

2 points:Covers some common high-incidence diseases, but lacks dedicated clinics for several other prevalent conditions.

3 points:Basically covers the common high-incidence diseases within the department's scope with corresponding dedicated clinics for major conditions.

4 points:Comprehensively covers common high-incidence diseases, and includes clinics for

some less frequent but high-severity diseases.

5 points:Not only comprehensive coverage, but also establishes disease-specific clinics for conditions uniquely prevalent in the region.

(Score 0 if no disease-specific clinics are established.)

3. To what extent does the number of DRG groups managed by the clinical department cover basic common diseases?

□ (1 point) □ (2 points) □ (3 points) □ (4 points) □ (5 points)

1 point: The number of DRG groups managed is significantly below the average for comparable departments in peer hospitals, covering only a very limited number of basic common diseases.

2 points:The number is below the average for comparable departments, covering some basic common diseases.

3 points:The number meets the average for comparable departments, basically covering all fundamental common diseases within the department's scope.

4 points:The number exceeds the average for comparable departments, not only covering all basic common diseases comprehensively but also including some uncommon subtypes of common diseases.

5 points:The number is significantly higher than the average for comparable departments, with no apparent gaps in coverage of basic common diseases.

4. To what extent does the clinical department cover nationally mandated key specialty areas?

□ (1 point) □ (2 points) □ (3 points) □ (4 points) □ (5 points)

1 point:The department does not cover nationally mandated key specialty areas for development, failing to meet basic patient care needs.

2 points:The department partially covers nationally mandated areas, but with significant gaps, resulting in limited service capacity.

3 points:The department basically covers the main nationally mandated specialty areas, providing common specialized diagnostic and treatment services.

4 points:The department comprehensively covers nationally mandated specialty areas and includes some subspecialized fields, offering more refined services.

5 points:Beyond comprehensive coverage, the department has specifically strengthened key nationally mandated specialties corresponding to regionally high-prevalence diseases.

5. How well-developed is the clinical department’s adaptation mechanism for healthcare

insurance reform?

□ (1 point) □ (2 points) □ (3 points) □ (4 points) □ (5 points)

1 point:No designated personnel handles insurance reform matters; patients face difficulties with reimbursement and inquiries.

2 points:Part-time staff handle insurance affairs but struggle with core aspects like payment reform.

3 points:Dedicated personnel manage insurance, covering basic functions like policy interpretation and reimbursement review.

4 points:An insurance management team/group (e.g., DRG/DIP accounting specialists) is established, capable of addressing specialized reform issues precisely.

5 points:A "Insurance Administrator + Clinical Liaison" mechanism is built, comprehensively covering reform tasks and resolving patient issues in real-time.

6. How well-developed is the clinical department's operational management mechanism?

□ (1 point) □ (2 points) □ (3 points) □ (4 points) □ (5 points)

1 point:No operational management mechanism exists; processes are chaotic, with frequent patient problems like appointment difficulty and long wait times for tests.

2 points:A simple operational coordination role exists but is not systematized, only handling basic scheduling.

3 points:A basic operational management mechanism exists, covering functions like process optimization and resource scheduling.

4 points:The operational management mechanism includes specialized teams (e.g., outpatient optimization group) to tackle specific operational problems.

5 points: An "Operations Manager + Clinical Liaison" mechanism is built, capable of collecting and rapidly responding to patient needs in real-time.

7. How well-developed is the clinical department's mechanism for improving patient experience?

□ (1 point) □ (2 points) □ (3 points) □ (4 points) □ (5 points)

1 point:No one is responsible for patient experience; problems are prominent and unresolved.

2 points:A simple role exists for collecting patient feedback but lacks a systematic processing mechanism.

3 points:A dedicated patient experience manager/administrator handles routine feedback and process improvements.

4 points:A patient experience management team/group addresses key process pain points like registration and payment.

5 point:A collaborative “Patient Experience Manager + Patient Representative” mechanism is built, comprehensively collecting needs and optimizing services.

8. Proportion of day surgery among elective surgeries.

The indicator’s score is proportionally converted from the corresponding score in the National (or Provincial) Performance Evaluation for third-level public hospitals.

9. Coverage rate of wards providing high-quality nursing services.

The indicator’s score is proportionally converted from the corresponding score in the National (or Provincial) Performance Evaluation for third-level public hospitals.

10. Increase rate of average outpatient expense per visit.

The indicator’s score is proportionally converted from the corresponding score in the National (or Provincial) Performance Evaluation for third-level public hospitals.

11. Increase rate of average inpatient expense per admission.

The indicator’s score is proportionally converted from the corresponding score in the National (or Provincial) Performance Evaluation for third-level public hospitals.

12. In the previous year (2024), how many new knowledge areas or technologies were introduced by the clinical department?

□ (1 point) □ (2 points) □ (3 points) □ (4 points) □ (5 points)

1 point:≤3 introductions, primarily basic technologies with minimal involvement in cutting-edge areas.

2 points:4-6 introductions, covering a narrow range of conditions, only addressing some routine diagnostic/treatment issues.

3 points:7-10 introductions, encompassing common technologies for the department, basically meeting daily patient care needs.

4 points:11-15 introductions, featuring diverse technology types, including multi-disciplinary specialty techniques.

5 points:>15 introductions, with a high proportion being cutting-edge technologies, significantly enhancing core diagnostic and treatment capabilities.

13. In the previous year (2024), how many academic conferences did the clinical department’s medical staff attend?

□ (1 point) □ (2 points) □ (3 points) □ (4 points) □ (5 points)

1 point:Annual attendance ≤10, far below comparable departments, indicating lagging

knowledge renewal.

2 points:Annual attendance 11-20, below average, indicating slow knowledge renewal.

3 points:Annual attendance 21-30, meeting basic requirements, with relatively timely knowledge updates.

4 points:Annual attendance 31-40, exceeding industry average, covering multi-disciplinary frontier conferences.

5 points:Annual attendance >40, including many high-caliber conferences, closely following technological frontiers.

14. In the previous year (2024), what was the completion status of Continuing Medical Education (CME) credits for the clinical department's medical staff?

□ (1 point) □ (2 points) □ (3 points) □ (4 points) □ (5 points)

1 point:Credit attainment rate ≤60%; most staff did not meet annual requirements.

2 points:Attainment rate 60%-75%; nearly half of staff are non-compliant, indicating overall insufficient knowledge renewal.

3 points:Attainment rate 75%-90%; most staff complete credits, with relatively timely knowledge updates.

4 points:Attainment rate 90%-95%; the vast majority are compliant, with continuous knowledge/skill enhancement.

5 points:Attainment rate >95%; essentially all staff complete credits, indicating efficient knowledge/skill renewal.

15. In the previous year (2024), what was the level of investment in learning and research funding for the clinical department?

□ (1 point) □ (2 points) □ (3 points) □ (4 points) □ (5 points)

1 point:Annual per capita investment in learning resources < ¥500, indicating severe underfunding.

2 points:Annual per capita investment ¥500-1000, relatively low, leading to slow knowledge renewal.

3 points:Annual per capita investment ¥1001-2000, moderate, able to meet basic learning needs.

4 points:Annual per capita investment ¥2001-3000, relatively sufficient, supporting high-end academic activities.

5 points:Annual per capita investment > ¥3000, sufficient and rationally allocated, facilitating mastery of frontier technologies.

16. Research project funding per 100 health technicians.

The indicator's score is proportionally converted from the corresponding score in the National (or Provincial) Performance Evaluation for third-level public hospitals.

17. Commercialization revenue from research outcomes per 100 health technicians.

The indicator's score is proportionally converted from the corresponding score in the National (or Provincial) Performance Evaluation for third-level public hospitals.

18. In the previous year (2024), how many internal training sessions did the clinical department conduct?

□ (1 point) □ (2 points) □ (3 points) □ (4 points) □ (5 points)

1 point:Average ≤5 sessions annually; extremely low frequency, content limited to basic protocols.

2 points:Average 6-10 sessions annually; coverage not comprehensive, mostly routine content.

3 points:Average 11-15 sessions annually; covering basic skills for major disease areas, meeting daily needs.

4 points:Average 16-20 sessions annually; including multi-disciplinary specialized skills, with targeted training.

5 points:Average ≥20 sessions annually; containing diverse content like frontier tech and emergency response, indicating a well-developed training system.

19. Over the past three years (Jan 2022 - Dec 2024), how many research projects did the clinical department undertake?

□ (1 point) □ (2 points) □ (3 points) □ (4 points) □ (5 points)

1 point:0-3 projects initiated; minimal outcomes, difficult to translate/applicate.

2 points:4-6 projects initiated; limited outcomes, with little translation/application.

3 points:7-9 projects initiated; some outcomes translated, enhancing basic diagnostic/treatment capabilities.

4points:10-12 projects initiated; good outcome translation, with notable technological innovation.

5points:13-15 (or more) projects initiated; abundant outcomes with significant translation/application, markedly elevating diagnostic/treatment standards.

Note: Research projects include: ①Funded vertical/horizontal projects at various levels led by the department, IITs, and collaborative projects with allocated funds. ②Clinical trial projects.

20. Over the past three years (Jan 2022 - Dec 2024), what is the level of the clinical department's research output?

□ (1 point) □ (2 points) □ (3 points) □ (4 points) □ (5 points)

1 point:Scarce research output. No national/provincial projects, or only a few unfunded provincial ones. Minimal total publications (≤3), with no SCI papers or only a few low-tier SCI/core Chinese journal papers.

2 points: Limited research output. No national projects, but undertakes 1-2 funded provincial projects. Few publications (4-9), possessing SCI publication capability but primarily in Q3/Q4, with scarce high-quality papers.

3 points:Good research output. Leads 1 national project, or undertakes ≥3 well-funded provincial projects. Publications number 10-15, with a considerable proportion being SCI papers including some Q2 or above.

4 points:Excellent research output. Leads 2-4 well-funded national projects. Prolific publications (14-26), dominated by SCI with stable output in Q1 or TOP journals.

5 points:Outstanding research output. Leads far more than 4 national key projects with substantial funding. High volume and quality of publications, overwhelmingly SCI, with sustained high output in Q1 TOP journals, representing domestic leadership.

21. First-time pass rate for the National Medical Licensing Examination for the hospital's resident physicians.

The indicator's score is proportionally converted from the corresponding score in the National (or Provincial) Performance Evaluation for third-level public hospitals.

22. In the previous year (2024), how many members of the clinical department held positions as Chairperson, Vice-Chairperson, or Standing Committee Member in provincial-level or above health-related societies/associations?

□ (1 point) □ (2 points) □ (3 points) □ (4 points) □ (5 points)

1 point:0 persons. Academic influence needs enhancement; no core roles in major academic societies.

2 point:1 person. Breakthrough in society involvement, beginning to generate initial influence.

3 points:2 persons. Establishing preliminary team influence within societies, possessing stable communication channels.

4 points:3-4 persons. Formed an influential team within societies, or holds important roles in national-level societies, with influence extending beyond the province.

5 points:≥5 persons. Possesses strong voice and leadership in both national and provincial academic societies, recognized as an academic highland in the field.

23. Over the past three years (Jun 2022 - Jun 2025), what is the change in the proportion of doctors with doctoral degrees in the clinical department?

□ (1 point) □ (2 points) □ (3 points) □ (4 points) □ (5 points)

1 point:No change or decrease (increase ≤0%). Reflects stagnant or regressing talent structure, lacking mechanisms for high-level talent recruitment/development, indicating a weak foundation for learning capability.

2 points:Increase of 1%-5%. Indicates initial attempts at talent upgrading with limited effect; proportion of PhD holders remains low (typically ≤10%); learning capability improves slowly.

3 points:Increase of 6%-15%, OR final proportion reaches 11%-30%. Shows continuous optimization of talent structure; PhD holders become a significant component; learning capability gradually strengthens.

4 points:Increase of 16%-25%, OR final proportion reaches 31%-50%. Signifies markedly increased talent density; PhD holders approach or exceed one-third; learning capability is relatively strong with improved knowledge translation efficiency.

5 points:Increase ≥26%, OR final proportion ≥51%. Represents a leap in talent structure; PhD holders become the dominant force; outstanding learning capability with advantages in sustained innovation and knowledge integration.

24. Incidence of complications in surgical patients.

The indicator’s score is proportionally converted from the corresponding score in the National (or Provincial) Performance Evaluation for third-level public hospitals.

25. Positive detection rate for large medical equipment examinations.

The indicator’s score is proportionally converted from the corresponding score in the National (or Provincial) Performance Evaluation for third-level public hospitals.

26. Proportion of Level IV surgeries among discharged patients.

The indicator’s score is proportionally converted from the corresponding score in the National (or Provincial) Performance Evaluation for third-level public hospitals.

27. Proportion of revenue from auxiliary medications.

The indicator’s score is proportionally converted from the corresponding score in the National (or Provincial) Performance Evaluation for third-level public hospitals.

28. Functional grading level of Electronic Medical Record application.

The indicator's score is proportionally converted from the corresponding score in the National (or Provincial) Performance Evaluation for third-level public hospitals.

29. Energy consumption expenditure per ¥10,000 revenue.

The indicator's score is proportionally converted from the corresponding score in the National (or Provincial) Performance Evaluation for third-level public hospitals.

30. Average rate of appointment-based outpatient visits.

The indicator's score is proportionally converted from the corresponding score in the National (or Provincial) Performance Evaluation for third-level public hospitals.

31. Average waiting time after appointment for outpatients.

The indicator's score is proportionally converted from the corresponding score in the National (or Provincial) Performance Evaluation for third-level public hospitals.

32. In the previous year (2024), what was the bed occupancy rate of the clinical department?

□ (1 point) □ (2 points) □ (3 points) □ (4 points) □ (5 points)

1 point:45% (inclusive) to 55%. Inefficient bed utilization, with excessively long inpatient waiting times.

2 points:55% (inclusive) to 65%. Average bed utilization efficiency, with relatively long patient waits.

3 points:65% (inclusive) to 75%. Moderate bed utilization efficiency, basically meeting inpatient demand.

4 points:75% (inclusive) to 85%. Moderate bed utilization efficiency, with short patient wait times.

5 points:≥85%. Highly efficient bed utilization, ensuring timely patient admission.

(Score 0 if below 45%.)

33. Average daily inpatient workload per licensed physician.

The indicator's score is proportionally converted from the corresponding score in the National (or Provincial) Performance Evaluation for third-level public hospitals.

34. Nurse-to-Physician ratio.

The indicator's score is proportionally converted from the corresponding score in the National (or Provincial) Performance Evaluation for third-level public hospitals.

35. Number of pharmacists per 100 hospital beds.

The indicator's score is proportionally converted from the corresponding score in the National (or Provincial) Performance Evaluation for third-level public hospitals.

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Annex C: Framework for Hospital Brand Equity Indicators

First-level indicators	Secondary indicators	Third-level indicators
I-1 Hospital Brand Loyalty	II-1 Behavioral Loyalty	III-1 Revisit Rate
		III-2 Patient Retention Rate
		III-3 Likelihood to Recommend
	II-2 Attitude Loyalty	III-4 Overall Trust Sensing
		III-5 Relationship Value Sensing
		III-6 Repurchase Intention
		III-7 Word-of-Mouth Propagation
	II-3 Crisis Support	III-8 Willingness to Retain Medical Treatment after Negative Events
		III-9 Trust Restoration Willingness
		III-10 Recommendation Restoration Willingness
I-2 Brand Quality	II-4 Technical Quality	III-11 Proportion of Grade IV Surgeries among Discharged Patients
		III-12 Mortality Rate among Low-Risk Group Cases
	II-5 Functional Quality	III-13 Utilization Rate of Full-Process Self-Service Terminals
		III-14 Timeliness Rate of “Cloud-based Film” Delivery for Examinations and Tests
		III-15 Compliance Rate of Barrier-Free Facilities
		III-16 Compliance Rate of Anti-Slip Floors
		III-17 Clarity of sign guidance
		III-18 Timely Response Rate for Follow-up Visits via Internet Hospital
	II-6 Social Responsibility	III-19 Coverage Rate of Public Welfare Medical Science Popularization Services
		III-20 Medical Support Rate for Vulnerable Groups
I-3 Brand	II-7 Association Attributes	III-21 Technical Competence Sensing

Associations		III-22 Compliance Rate of Treatment Effectiveness
		III-23 Service Response Efficiency
		III-24 Costs Rationality Sensing
		III-25 Quality of Physician-Patient Communication
		III-26 Sense of Acquired Emotional Support
	II-8 Association Strength	III-27 Memory Retrieval Speed
		III-28 Feature Association Density
		III-29 Emotional Resonance Intensity
	II-9 Association Preference	III-30 Revisit Choice Inclination
		III-31 Differentiating Features Identification
		III-32 Irreplaceability Sensing
I-4 Brand Awareness	II-10 Experience Layer Awareness	III-33 Name Awareness / Name Recognition Rate
		III-34 Architectural (Landmark) Awareness / Recognition Rate of Major Hospital Buildings
		III-35 Specialized Disease TreatmentsAwareness
		III-36 Characteristic TechnologiesAwareness
		III-37 Characteristic ServicesAwareness
	II-11 Relationship Layer Awareness	III-38 Forwarding Rate of Negative Public Sentiment
		III-39 Interaction Density of User-Generated Content
		III-40 Public Event Awareness
		III-41 Emergency Response Evaluation
	II-12 Communication Layer Awareness	III-42 Search Weight Index
		III-43 Content Quality Coefficient

Annex D: Survey Questionnaire on Brand Equity of Public Hospitals

Dear Sir/Madam,

We are writing to sincerely invite you to participate in this survey on brand equity of public hospitals. Your genuine feedback and valuable opinions are crucial to helping us improve the quality of our medical services and enhance our hospital's brand.

This questionnaire is conducted anonymously. All data will be used solely for overall analysis, and your personal information will be kept strictly confidential. Please feel assured to provide your responses. The survey will take approximately 8–10 minutes to complete.

Thank you for your support. Wishing you good health and happiness!

Basic Information

Name: _____

Contact Phone Number (For follow-up purposes): _____

Age: _____ years (Year _____ Month _____)

Gender: Male□ Female□

Highest Education Level (Please check the appropriate option ☑):

①Primary school or below ②Junior high school ③High school / Technical secondary school ④Bachelor’s / Associate degree ⑤Master’s degree ⑥Doctoral degree

Your Occupation (Please check the appropriate option ☑):

①Employee of government agencies, political parties, mass organizations, or public institutions ②Corporate employee ③Flexible / Informal employment ④Urban resident ⑤Rural resident ⑥Student ⑦Military personnel ⑧Retired ⑨Other (Please specify): _____

Current Living Arrangement (Please check the appropriate option ☑):

①Living alone ②Living with family (spouse, children, parents, or other relatives) ③Living with roommates (non-relatives) ④Other (Please specify): _____

Average Monthly Income (CNY) (Please check the appropriate option ☑):

①Less than 3,000 ②3,000–4,999 ③5,000–7,999 ④8,000–9,999 ⑤10,000 and above

Hospital / Clinical Department where the patient was interviewed:

Survey Questionnaire

1. Number of follow-up visits within the past year:

□ 1 time (1 point): Only 1 follow-up visit

□ 2 times (2 points): 2 follow-up visits

□ 3 times (2 points): 3 follow-up visits

□ 4 times (2 points): 4 follow-up visits

□ ≥ 5 times (5 points): 5 or more follow-up visits

□ 0 times (0 points): No follow-up visit conducted

2. In the next three years, if ongoing medical treatment is required, how likely are you to choose to continue receiving care at this hospital/clinical department?

□ Very low (1 point): Highly unlikely; would prioritize transferring to another hospital/department

□ Low (2 points): Reluctant; would only choose it if no better options are available

□ Neutral (3 points): Acceptable; no strong preference

□ High (4 points): Quite willing; it meets most of my needs

□ Very high (5 points): Definitely continue; high level of trust and dependence

3. How likely are you to recommend this hospital/clinical department to relatives or friends?

□ Very low (1 point): Would not recommend; multiple significant issues

□ Low (2 points): Rarely recommend; many aspects need improvement

□ Neutral (3 points): Might consider recommending; no notable strengths

□ High (4 points): Willing to recommend; has commendable strengths worth sharing

□ Very high (5 points): Highly recommend; strong trust and actively share positive experiences

4. To what extent do you trust this hospital/clinical department?

□ Very low (1 point): No trust at all; believe serious problems exist

□ Low (2 points): Low level of trust; significant doubts about technical competence and service

□ Neutral (3 points): Moderately trust; have some recognition but also concerns

□ High (4 points): Quite trusting; recognize the medical standards and service attitude

□ Very high (5 points): Complete trust; highly rely on and feel assured entrusting my health

to them

5. Do you feel respected and valued in the patient-doctor relationship?

□ Not at all (1 point): Feel completely disrespected and undervalued

□ Seldom (2 points): Occasionally felt respected, but overall experience is poor

□ Sometimes (3 points): Feel moderately respected; experience varies

□ Often (4 points): Frequently feel respected and valued

□ Always (5 points): Always feel respected and valued

6. If the same condition recurs, how likely are you to choose this hospital/clinical department as your first option?

□ Very low (1 point): Would not choose; would prioritize another hospital/department

□ Low (2 points): Unlikely to choose; have concerns about receiving treatment here again

□ Neutral (3 point): Would depend on the situation; no strong preference

□ High (4 points): Very likely to choose; recognize its strengths

□ Very high (5 points): Would definitely choose; high level of dependence and trust

7. In the past six months, how often have you actively praised this hospital/clinical department to others?

□ Almost never (1 point): 0 times

□ Occasionally (2 points): 1-2 times

□ Sometimes (3 points): 3-5 times

□ Often (4 points): Fairly often (approximately 6-9 times)

□ Very frequently (5 points): Frequently and actively recommend (10 times or more)

8. In the event of a medical dispute (non-major incident), how willing would you be to continue receiving care at this hospital/clinical department?

□ Unwilling (1 point): No longer trust; would transfer immediately

□ Low willingness (2 points): Would carefully consider transferring; doubtful about resolution capabilities

□ Neutral (3 points): Would defer decision pending observation of how the situation is handled

□ Willing (4 points): Believe it can be properly resolved; would continue treatment

□ Very willing (5 points): Complete trust; firmly choose to continue

9. After the dispute is resolved, how willing are you to restore your trust in this hospital/clinical department?

□ Very low (1 point): Unable to restore; completely lost trust

□ Low (2 points): Difficult to restore; requires concrete proof through actions

□ Neutral (3 points): Adopt a wait-and-see attitude; depends on subsequent performance

□ High (4 points): Willing to restore; acknowledge resolution and improvements

□ Very high (5 points): Fully restored; trust has even strengthened

10. After the dispute is resolved, how likely are you to resume recommending this hospital/clinical department?

□ Very low (1 point): Completely lost trust; would not recommend

□ Low (2 points): Resolution did not meet expectations; unlikely to recommend

□ Neutral (3 points): Adopt a wait-and-see stance; depends on subsequent improvements

□ High (4 points): Resolution was proactive and effective; willing to recommend

□ Very high (5 points): Very satisfied; would actively and consistently recommend

11. Are you aware of the complex/high-difficulty surgeries performed in this hospital/clinical department?

□ Not at all aware (1 point): Completely unaware

□ Slightly aware (2 points): Have heard but not certain

□ Somewhat aware (3 points): Know about it but unclear on specifics

□ Basically informed (4 points): Understand the main types of surgeries

□ Very clear (5 points): Fully understand the details of the surgeries

12. How would you rate the level of medical safety in this hospital/clinical department?

□ Very low (1 point): Frequent incidents; poor safety management

□ Low (2 points): Some hidden risks; safety issues occur often

□ Moderate (3 points): Generally safe but room for improvement

□ High (4 points): Well-managed; feel assured during visits

□ Very high (5 points): Strict management; zero incident record

13. How often do you use self-service machines (for registration/payment/reports)?

□ Very rarely (1 point): Never use

□ Rarely (2 points): Seldom use; only in special cases

□ Occasionally (3 points): Use sometimes

□ Frequently (4 points): Use often; handle most transactions via self-service machines

□ Very frequently (5 points): Use self-service machines whenever possible

14. How timely do you receive cloud-based imaging reports from this hospital/clinical department?

□ Severely delayed (1 point): Always significantly delayed

□ Often delayed (2 point): Frequently not received on time

□ Mostly on time (3 points): Usually received within expected time

□ Quite timely (4 points): Generally received quickly

□ Real-time push (5 points): Reports are pushed immediately and received promptly

15. How accessible are the wheelchair ramps/braille pathways and other facilities in this hospital/clinical department?

□ Completely inaccessible (1 point): Blocked or severely damaged; cannot be used normally

□ Not very accessible (2 points): Often obstructed or flawed; relatively difficult to use

□ Moderately accessible (3 points): Basically usable but with some inconveniences or defects

□ Quite accessible (4 points): Unobstructed and standard; no significant barriers; easy to use

□ Highly accessible (5 points): Well-designed and smooth; greatly facilitate user movement

16. How would you rate the slip resistance safety of floors in this hospital/clinical department?

□ Very hazardous (1 point): Floors are slippery; high risk of falling; poor safety

□ Somewhat hazardous (2 points): Some areas lack slip resistance; slipping risks exist

□ Moderately safe (3 points): Generally safe, but still risky in wet conditions

□ Quite safe (4 points): Proper anti-slip measures in place; relatively safe to walk

□ Very safe (5 points): Excellent slip resistance; fully ensured safety

17. Are the guidance signs/wayfinding boards in this hospital/clinical department clear and easy to understand?

□ Very confusing (1 point): Signs are chaotic and illogical; very difficult to follow

□ Not very clear (2 points): Guidance is vague; poorly placed; hard to use

□ Basically clear (3 points): Mostly understandable but with room for improvement

□ Quite clear (4 points): Well-designed; directions are clear; easy to navigate

□ Very clear (5 points): Clear and intuitive; prominently placed; highly efficient guidance

18. How timely are the responses to online follow-up consultations in this hospital/clinical department?

□ Over 48 hours (1 point): Responses take over 48 hours; severely delayed

□ 24–48 hours (2 points): Responses within 24–48 hours; relatively slow

□ 12–24 hours (3 points): Responses within 12–24 hours; average speed

□ 2–12 hours (4 points): Responses within 2–12 hours; fairly quick

□ Within 2 hours (5 points): Responses within 2 hours; highly efficient

19. Have you been exposed to health lectures/educational materials from this hospital/clinical department?

□ Never (1 point): Never encountered any related lectures or materials

□ Rarely (2 points): Exposed only once; left little impression

□ Occasionally (3 points): Exposed 1–2 times; somewhat beneficial

□ Quite often (4 points): Exposed 2–3 times; content was practical and helpful

□ Frequently (5 points): Exposed ≥3 times; highly beneficial

20. Have you observed special considerations for the elderly/people with disabilities in this hospital/clinical department?

□ None (1 point): No special facilities; extremely inconvenient

□ Very few (2 points): Only minimal basic facilities; inadequate for needs

□ Some (3 points): Basic facilities available but not comprehensive; still some inconvenience

□ Quite a few (4 points): Facilities available in most areas; details could be improved

□ Fully covered (5 points): Comprehensive and well-designed facilities; excellent barrier-free experience

21. How would you rate the professional competence of physicians in this hospital/clinical department?

□ Highly unprofessional (1 point): Weak foundational knowledge and insufficient experience; unable to practice independently

□ Below average (2 points): Incomplete knowledge; not yet proficient in routine operations

□ Average (3 points): Capable of handling routine cases independently; moderate ability to manage complex situations

□ Quite professional (4 points): Solid knowledge and extensive experience; skilled in managing both common and complex cases

□ Top-level (5 points): Outstanding experience and technical excellence; highly efficient in resolving difficult and severe cases

22. To what extent did the actual treatment effectiveness meet your expectations?

□ Far below expectations (1 point): Symptoms worsened after treatment; completely contrary to expected improvement

□ Below expectations (2 points): Some symptom relief, but significant discomfort remains; improvement did not meet expectations

□ Met expectations (3 points): Noticeable symptom improvement; generally consistent with expected level and pace of recovery

□ Exceeded expectations (4 points): Good symptom improvement; recovery better than expected

□ Far exceeded expectations (5 points): Symptoms almost completely resolved; excellent physical condition; greatly surpassed pre-treatment expectations

23. How long was the waiting time for registration/medication pickup/examinations in this hospital/clinical department?

□ Extremely long (1 point): Extremely time-consuming; seriously delayed subsequent schedules

□ Quite long (2 points): Long waiting time; significantly negatively affected the medical experience

□ Moderate (3 points): Waiting time acceptable

□ Relatively short (4 points): Waiting time reasonable and tolerable

□ Very short (5 points): Almost no long waiting; highly efficient process

24. How well do the medical costs align with the service quality in this hospital/clinical department?

□ Poor value (1 point): High cost, poor service, unsatisfactory experience

□ Slightly mismatched (2 points): Slightly high cost with average service

□ Basically matched (3 points): Cost matches service; meets expectations

□ Well matched (4 points): Reasonable cost with good service

□ Excellent value (5 points): Reasonable cost, high-quality service, exceeded expectations

25. Did the doctors explain the medical condition patiently and clearly?

□ Perfunctory (1 point): Doctor was indifferent and explained briefly; patient felt unable to ask further questions

□ Somewhat impatient (2 points): Doctor explained hastily, spoke quickly, and did not emphasize important information

□ Neutral attitude (3 points): Doctor spoke calmly, explained normally, responded to some questions, but with limited depth

□ Patient and detailed (4 points): Doctor listened attentively, answered all questions, and explained in an understandable manner

□ Thorough and clear (5 points): Doctor explained patiently with aids like cases or diagrams; patient fully understood

26. Did the medical staff in this hospital/clinical department provide psychological support?

□ No support at all (1 point): Showed no concern; offered no comfort

□ Minimal support (2 points): Occasionally provided reassurance, but rather perfunctory

□ Moderate support (3 points): Proactively inquired and offered simple comfort

□ Quite proactive (4 points): Often took initiative to reassure and encourage

□ Extremely caring (5 points): Provided continuous proactive care and comprehensive support

27. Can you quickly recall the details of your visit to this hospital/clinical department?

□ Completely forgotten (1 point): No memory of the entire visit process

□ Vague memory (2 points): Only remember having been there; cannot recall specific details

□ Some impression (3 points): Remember key steps, but details are unclear

□ Quite clear (4 points): Can clearly recall main procedures and key instructions

□ Extremely vivid (5 points): All details are deeply impressed and clear as yesterday

28. How many keywords come to mind when you think of this hospital/clinical department?

□ 0 keywords (1 point): No impression; lacks basic awareness

□ 1–2 keywords (3 points): Basic awareness (e.g., location, name)

□ ≥3 keywords (5 points): In-depth understanding (e.g., specialty departments, experts)

29. How strong is your emotional connection to this hospital/clinical department?

□ No feeling (1 point): No emotional attachment; view it as an ordinary place

□ Slight impression (2 points): Vague memory but no emotional resonance

□ Mildly touched (3 points): Slight emotional response due to certain details (e.g., staff care)

□ Growing attachment (4 points): Developed trust and positive feelings through multiple contacts; willing to recommend

□ Strong identification (5 points): Strong sense of belonging; highly identify with and actively uphold its reputation

30. Compared to other hospitals, how inclined are you to choose this hospital/clinical department for follow-up visits?

□ Definitely not (1 point): Would not consider returning under any circumstances

□ Slightly inclined (2 points): Usually not a priority; relatively unlikely

□ Neutral (3 points): Would consider if conditions are suitable

□ Quite inclined (4 points): Would prioritize unless there are special reasons

□ Absolute first choice (5 points): Unconditionally prefer; would not consider others

31. Compared to other hospitals, how clearly can you identify the unique features of this hospital/clinical department?

□ Not at all (1 point): Unable to identify any distinctive features

□ Somewhat difficult (2 points): Difficult to recognize significant characteristics

□ Neutral (3 points): Can notice some differences, but they are not prominent or easily confused

□ Relatively easy (4 points): Can relatively easily identify noticeable features in multiple aspects

□ Very clear (5 points): Very familiar with distinct features in all aspects; can differentiate instantly

32. Do you consider this hospital/clinical department irreplaceable?

□ Easily replaceable (1 point): No distinctive features; experience is no different from other hospitals

□ Somewhat replaceable (2 points): Slightly distinctive, but easily imitated by other hospitals

□ Somewhat difficult to replace (3 points): Clearly distinctive; other hospitals/departments would need considerable effort to match

□ Difficult to replace (4 points): Unique system; other hospitals would find it hard to surpass in the short term

□ Completely irreplaceable (5 points): Truly unique; provides value unavailable elsewhere

33. Can you accurately state the full name of this hospital/clinical department?

□ Incorrect (1 point): Completely unaware

□ Vaguely correct (2 points): Have a vague impression but cannot state it accurately

□ Partially correct (3 points): Can state part of the name but not the full title

□ Mostly accurate (4 points): Can accurately state the full name

□ Fully accurate (5 points): Can accurately state the full name and understand its meaning

34. Can you describe the iconic building/logo of this hospital/clinical department?

□ Unable to describe (1 point): No impression at all

□ Faint impression (2 points): Only a vague sense; cannot recall details

□ Vague description (3 points): Can recall some elements but description is incomplete or inaccurate

□ Mostly accurate (4 points): Can describe most features with only minor inaccuracies

□ Accurate description (5 points): Can fully and accurately describe all details

35. Can you name at least one key department in this hospital/clinical department?

□ Completely unaware (1 point): Do not know any key departments

□ Aware of existence only (2 points): Know key departments exist but cannot name any

□ Know the field (3 points): Understand the general field but cannot provide exact names

□ Relatively familiar (4 points): Can accurately name at least one key department

□ Well informed (5 points): Can name departments and describe their specialties, experts, etc.

36. Are you aware of any specialized techniques (e.g., minimally invasive surgery) offered by this hospital/clinical department?

□ Not at all aware (1 point): Unaware of any specialized techniques

□ Slightly aware (2 points): Have heard of specialized techniques but do not know specifics

□ Know the name (3 points): Can name the technique but do not understand details

□ Partially understand (4 points): Know the basic applications and advantages

□ Fully understand (5 points): Clear about the principles, procedures, and applicable conditions

37. Are you aware of any specialized services (e.g., multidisciplinary consultation) offered by this hospital/clinical department?

□ Not at all aware (1 point): Unaware of any specialized services

□ Slightly aware (2 points): Have heard of specialized services but do not know specifics

□ Know the name (3 points): Can name the service but do not understand details

□ Understand the content (4 points): Know the service content and process but have not experienced it

□ Have personal experience (5 points): Have used the service and understand its process and value

38. If you saw negative news about this hospital/clinical department, how likely would you be to share it?

□ Share immediately (1 point): Would share without verifying authenticity

□ Share after skimming (2 points): Would briefly review content and share without verification

□ Share after partial verification (3 points): Would verify some information before possibly sharing

□ Share only after full verification (4 points): Would share only after detailed verification

□ Would never share (5 points): Would not share under any circumstances

39. How often do you comment on or like this hospital/clinical department's social media content?

□ Very rarely (1 point): Never comment or like; completely uninvolved

□ Rarely (2 points): At most once per month; very low engagement

□ Occasionally (3 points): About 1-2 times per week; interact when interested

□ Frequently (4 points): 3-5 times per week; regularly view and interact

□ Very frequently (5 points: Almost daily interaction; highly active and engaged

40. Are you aware of public events involving this hospital/clinical department (e.g., COVID-19 response efforts)?

□ Not at all aware (1 point): Have never heard of any related events

□ Slightly aware (2 points): Have heard of events but know no details

□ Vaguely aware (3 points): Know about involvement but not specific work

□ Partially aware (4 points): Know some specific work or roles

□ Fully aware (5 points): Clear about specific details and outcomes

41. How confident are you in this hospital/clinical department's ability to handle emergencies (e.g., power outages)?

□ Very low (1 point): No confidence at all; poor emergency response

□ Low (2 points): Weak confidence; measures are often superficial

□ Neutral (3 points): Moderate confidence; effectiveness is uncertain

□ High (4 points): Strong confidence; measures are scientific and effective

□ Very high (5 points): Full confidence; can quickly control the situation

42. How many times have you searched for information about this hospital/clinical department in the past six months?

□ 0 times (0 points)

□ 1 time (1 point): Searched occasionally; low level of attention

□ 2 times (2 points): Searched infrequently; low intention

□ 3 times (3 points): Searched multiple times; relatively attentive

□ 4 times (4 points): Searched frequently; actively seeking information

□ ≥5 times (5 points): Highly attentive; search very often

43. How useful is the popular science/news content released by this hospital/clinical department?

□ Very low (1 point): Content is useless; no help at all

□ Low (2 points): Information is superficial; limited practicality

□ Neutral (3 points): Generally useful but room for improvement

□ High (4 points): Relevant to needs; clear and practical explanations

□ Very high (5 points): Forward-looking content; highly instructive and significantly helpful

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Annex E: Scale for Measuring Hospital Dynamic Capabilities and Brand Equity (First-Round Expert Consultation Form)

Dear Expert:

Hello! The high-quality development of public hospitals depends on the coordinated improvement of dynamic capabilities and brand assets. Constructing a set of scientific and applicable dynamic capability and brand asset measurement index system is of great significance for public hospitals to optimize resource allocation and enhance core competitiveness. Based on the literature analysis and the foundation of previous research, the research team of this study initially constructed a measurement scale for the dynamic capacity and brand assets of public hospitals, which consists of 7 first-level indicators, 24 second-level indicators, and 96 third-level indicators (for details, see Table 1-6). To further improve this indicator system, given that you have long been engaged in research in the fields of health management, medical and health care, medical education, clinical medicine or related areas, and possess rich experience and profound academic attainments, we hereby invite you to serve as a consulting expert for this research. The research team of this study is expected to conduct 2 to 3 rounds of consultations. The collected data will be strictly confidential. Thank you sincerely for your support and guidance.

The instructions for filling out this form are as follows:

1. Please determine whether the indicators at each level are appropriate:

①If you think this “indicator” does not need to be modified, please mark a “√” in the “In Favor” column of the table.

②If you think this “indicator”should be deleted, please mark a “√” in the “Delete” column of the table and fill in the reason in the “Reason for Deletion” column.

③If you think the “indicator name” needs to be modified, please mark a “√” in the "Modification" column of the table and write the modified name and the modification reason in the “Modification Reason” column.

④If you think it is necessary to “add indicators”, please write down the name of the new indicator and the reason for the addition in the table, and mark “√” in the corresponding “importance” section.

⑤If you have any other suggestions, please fill them in the “Other Suggestions” column.

Please respectively determine the “importance of each level of indicators, familiarity with the indicators, and basis for judgment”.

* Feedback methods: ① Email address: 173835393@qq.com; ② Contact: Wechat (wingwing_thankful)

* Completion time: Given the tight schedule of the project, please complete it by May 15th. We sincerely thank you for your support!

* Contact: Zhou Yingyi, Converged Media Center of the GuangdongSecond Provincial General Hospital, Tel: 13925081291, Email: 173835393@qq.com

* Note: The selection criteria for experts consulted by letter: ① Having engaged in research work in the fields of health management, medical and health care, medical education, clinical medicine or related areas for 10 years or more; ② Master's degree or above; ③ Professional and technical title of associate senior or above, or position of deputy director or above; ④Experts who are willing to participate in this research project and can complete at least two rounds of inquiries by letter are not allowed to withdraw halfway.

Research Group on the Framework Architecture of Dynamic Capabilities and Brand Equity of Public Hospitals
May 2nd, 2025

1. Basic Information of the Expert:

1.Your gender: ☐Male ☐Female;
2. Your age: years old;
3. Your years of service: years;
4. Your highest academic degree: ☐Master's degree☐Doctoral student
5. Your professional title:☐Associate Senior; ☐Senior
6. Your position: ☐Assistant to the Director of the department/section ☐Deputy Director of the department/section ☐Department/Section HeadOther positions:
7. Your workplace and department: ☐Higher education institutions; ☐Medical and health institutions ☐Other units:
8. Your work email address: Office Number:

2. Expert Judgment of the First-level Indicators:

Table 1 Expert Judgment Table for the First-Level Indicators of Hospital Dynamic Capacities

Serial Number	First-level indicators	Experts' opinions on the indicators					The importance of indicators (Mark "√" according to your own judgment)				
		Agree	Delete	Modify	Modify to	Reasons for deletion/modification	Very unimportant（1 point）	Not very unimportant（2 points）	Average（3 points）	Quite important（4 points）	Very important（5 points）
1	I-1Sensing Capability	☐	☐	☐			☐	☐	☐	☐	☐
2	I-2Learning Capability	☐	☐	☐			☐	☐	☐	☐	☐
3	I-3Integrative Capability	☐	☐	☐			☐	☐	☐	☐	☐
New Indicators											
Other suggestions											

Table 2 Expert Judgment Table for the First-Level Indicators of Hospital Brand Equity

Serial Number	First-level indicators	Experts' opinions on the indicators					The importance of indicators (Mark "√" according to your own judgment)				
		Agree	Delete	Modify	Modify to	Reasons for deletion/modification	Very unimportant（1 point）	Not very unimportant（2 points）	Average（3 points）	Quite important（4 points）	Very important（5 points）
1	I-1 Hospital Brand	☐	☐	☐			☐	☐	☐	☐	☐

	Loyalty										
2	I-2 Hospital BrandQuality	☐	☐	☐			☐	☐	☐	☐	☐
3	I-3 Hospital Brand Associations	☐	☐	☐			☐	☐	☐	☐	☐
4	I-4 Hospital Brand Awareness	☐	☐	☐			☐	☐	☐	☐	☐
New Indicators											
Other suggestions											

3. Expert Judgment of the Secondary Indicators:

Table 3 Expert Judgment Table for the Secondary Indicators of Hospital Dynamic Capacities

Number	First-level indicators	Secondary indicators	Indicator determination (Mark "√" or fill in the content according to your own judgment)					The importance of indicators (Mark "√"according to your own judgment)				
			Agree	Delete	Modify	Modify to	Reasons for deletion/modification	Very unimportant（1 point）	Not very unimportant（2 points）	Average（3 points）	Quite important（4 points）	Very important（5 points）
1	I-1Sensing Capability	II-1 Patient Needs Identification	☐	☐	☐			☐	☐	☐	☐	☐
		II-2 Policy Context Sensing	☐	☐	☐			☐	☐	☐	☐	☐
		II-3Multi-dimensional Sensing response	☐	☐	☐			☐	☐	☐	☐	☐
2	I-2Learning Capability	II-4 Knowledge acquisition	☐	☐	☐			☐	☐	☐	☐	☐
		II-5Learning and Research Funding	☐	☐	☐			☐	☐	☐	☐	☐

		II-6 Organizational Learning	☐	☐	☐			☐	☐	☐	☐	☐
		II-7Learning Effect	☐	☐	☐			☐	☐	☐	☐	☐
		II-8Human Resources	☐	☐	☐			☐	☐	☐	☐	☐
3	I-3Integrative Capability	II-9QualitySafety	☐	☐	☐			☐	☐	☐	☐	☐
		II-10Technical Level	☐	☐	☐			☐	☐	☐	☐	☐
		II-11Service Process	☐	☐	☐			☐	☐	☐	☐	☐
		II-12Resource Allocation	☐	☐	☐			☐	☐	☐	☐	☐
New Indicators												
Other suggestions												

Table 4 Expert Judgment Table for the Secondary Indicators of Hospital Brand Equity

Number	First-level indicators	Secondary indicators	Indicator determination (Mark "√" or fill in the content according to your own judgment)					The importance of indicators (Mark "√" according to your own judgment)				
			Agree	Delete	Modify	Modify to	Reasons for deletion/modification	Very unimportant（1 point）	Not very unimportant（2 points）	Average（3 points）	Quite important（4 points）	Very important（5 points）
1	I-1Hospital Brand Loyalty	II-1Behavioral loyalty	☐	☐	☐			☐	☐	☐	☐	☐
		II-2Attitude loyalty	☐	☐	☐			☐	☐	☐	☐	☐
		II-3Crisis support	☐	☐	☐			☐	☐	☐	☐	☐
2	I-2 Hospital BrandQuality	II-4 Technical Quality	☐	☐	☐			☐	☐	☐	☐	☐

		(Sensing)										
		II-5 Functional Quality(Sensing)	☐	☐	☐			☐	☐	☐	☐	☐
		II-6Social Responsibility (Sensing)	☐	☐	☐			☐	☐	☐	☐	☐
3	I-3 Hospital Brand Associations	II-7 Association Attributes	☐	☐	☐			☐	☐	☐	☐	☐
		II-8 Association Intensity	☐	☐	☐			☐	☐	☐	☐	☐
		II-9 Association Preference	☐	☐	☐			☐	☐	☐	☐	☐
4	I-4 Hospital Brand Awareness	II-10Experience Layer Awareness	☐	☐	☐			☐	☐	☐	☐	☐
		II-11Relationship Layer Awareness	☐	☐	☐			☐	☐	☐	☐	☐
		II-12Communication Layer Awareness	☐	☐	☐			☐	☐	☐	☐	☐
New Indicators												
Other suggestions												

4. Expert Judgment of the Third-level Indicators:

Table 5 Expert Judgment Table for the Third-level Indicators of Hospital Dynamic Capacities

Serial Number	First-level indicators	Secondary indicators	Third-level indicators	Indicator determination (Mark "√" or fill in the content according to your own judgment)					The importance of indicators (Mark "√" according to your own judgment)				
				Agree	Delete	Modify	Modify to	Reasons for deletion/ modification	Very unimportant (1 point)	Not very unimportant (2 points)	Average (3 points)	Quite important (4 points)	Very important (5 points)
1	I-1Sensing Capability	II-1Patient Needs Identification (Corresponding to III-1 to III-6)	III-1 Sub-specialty (Quaternary Specialty) Development Status	☐	☐	☐			☐	☐	☐	☐	☐
			III-2 Establishment of Specialized Disease Clinics	☐	☐	☐			☐	☐	☐	☐	☐
			III-3 Case Mix Breadth (Number of Diagnosis-Related Groups, DRGs)	☐	☐	☐			☐	☐	☐	☐	☐
			III-4 Proportion of Premium (or Private) Medical Services	☐	☐	☐			☐	☐	☐	☐	☐
			III-5 Average Outpatient Appointment Rate	☐	☐	☐			☐	☐	☐	☐	☐
			III-6 Average Post-Appointment Waiting Time for Outpatients	☐	☐	☐			☐	☐	☐	☐	☐
		II-2Policy	III-7 Development	☐	☐	☐			☐	☐	☐	☐	☐

		Context Sensing (Corresponding toIII-7 to III-12)	Status of Key Specialties Designated by the National Health Commission										
			III-8 Internal Organizational Structure in Response to Healthcare Security Reforms	☐	☐	☐			☐	☐	☐	☐	☐
			III-9 Internal Organization and Operational Mechanism for Hospital Operations Management	☐	☐	☐			☐	☐	☐	☐	☐
			III-10 Quality Control Performance for Single-Disease Diagnoses	☐	☐	☐			☐	☐	☐	☐	☐
			III-11 Physician-to-Nurse Ratio	☐	☐	☐			☐	☐	☐	☐	☐
			III-12 Internal Unit Dedicated to Patient Experience Improvement Policies	☐	☐	☐			☐	☐	☐	☐	☐
		II-3Multi-dimensional Sensing Response (Corresponding toIII-13 to III-18)	III-13 Provision of Ambulatory Chemotherapy Services	☐	☐	☐			☐	☐	☐	☐	☐
			III-14 Proportion of AmbulatorySurgeries	☐	☐	☐			☐	☐	☐	☐	☐
			III-15Implementatio	☐	☐	☐			☐	☐	☐	☐	☐

			n Status of Tiered Healthcare Delivery System										
			III-16 Coverage Rate of Wards Providing High-Quality Nursing Services	☐	☐	☐			☐	☐	☐	☐	☐
			III-17 Growth Rate of Average Cost per Outpatient Visit	☐	☐	☐			☐	☐	☐	☐	☐
			III-18 Growth Rate of Average Cost per Hospitalization	☐	☐	☐			☐	☐	☐	☐	☐
2	I-2Learning Capability	II-4Knowledge Acquisition(Corresponding toIII-19 to III-21)	III-19 Number of New Knowledge and Technology Introductions	☐	☐	☐			☐	☐	☐	☐	☐
			III-20 Frequency of Healthcare Staff Participation in Academic Conferences	☐	☐	☐			☐	☐	☐	☐	☐
			III-21 Completion Status of Continuing Medical Education (CME) Credits	☐	☐	☐			☐	☐	☐	☐	☐
		II-5 Learning and Research Funding(Corresponding toIII-22 to III-24)	III-22 Annual Financial Investment in Learning Resources	☐	☐	☐			☐	☐	☐	☐	☐
			III-23 Research Project Funding per 100 Healthcare Technicians	☐	☐	☐			☐	☐	☐	☐	☐
			III-24 Revenue from Research Output	☐	☐	☐			☐	☐	☐	☐	☐

			Translation per 100 Healthcare Technicians										
		II-6 Organizational Learning (Corresponding toIII-25 to III-26)	III-25 Number of Internal Training Sessions Conducted	☐	☐	☐			☐	☐	☐	☐	☐
			III-26 Quantity and Outcomes of Innovation Projects	☐	☐	☐			☐	☐	☐	☐	☐
		II-7Learning Effect (Corresponding toIII-27 to III-29)	III-27 Quantity and Quality of Scientific Research Outputs	☐	☐	☐			☐	☐	☐	☐	☐
			III-28 Clinical Application Rate of New Technologies and Therapies	☐	☐	☐			☐	☐	☐	☐	☐
			III-29 First-Attempt Pass Rate of the National Medical Licensing Examination for Hospital Resident Physicians	☐	☐	☐			☐	☐	☐	☐	☐
		II-8Human Resources(Corresponding toIII-30 to III-33)	III-30 Newly Recruited Key Talents at Various Levels over Three Years	☐	☐	☐			☐	☐	☐	☐	☐
			III-31 New Appointments as Committee Chairs in Medical Societies/Associations over Three Years	☐	☐	☐			☐	☐	☐	☐	☐
			III-32 Change in Proportion of Doctoral Degree Holders among	☐	☐	☐			☐	☐	☐	☐	☐

			Healthcare Technicians over Three Years										
			III-33 Performance in Medical Talent Training and Education	☐	☐	☐			☐	☐	☐	☐	☐
3	I-3 Integration Capability	II-9 QualitySafety	III-34 Incidence of Surgical Complications	☐	☐	☐			☐	☐	☐	☐	☐
			III-35 Positive Rate of Major Medical Equipment Examinations	☐	☐	☐			☐	☐	☐	☐	☐
			III-36 Maintenance, Repair, and Quality Control Management of Major Medical Equipment	☐	☐	☐			☐	☐	☐	☐	☐
		II-10 Technical Level	III-37 Proportion of Grade IV Surgeries among Discharged Patients	☐	☐	☐			☐	☐	☐	☐	☐
			III-38 Proportion of Revenue from Adjunctive Medications (Change over Three Years)	☐	☐	☐			☐	☐	☐	☐	☐
			III-39 Application Level Classification of Electronic Medical RecordFunctions	☐	☐	☐			☐	☐	☐	☐	☐
			III-40 Energy Consumption Expenditure per	☐	☐	☐			☐	☐	☐	☐	☐

			10,000 CNY Revenue (Change over Three Years)										
		II-11 Service Process	III-41 Average Outpatient Appointment Rate	☐	☐	☐			☐	☐	☐	☐	☐
			III-42 Average Post-Appointment Waiting Time for Outpatients	☐	☐	☐			☐	☐	☐	☐	☐
		II-12 Resource Allocation	III-43 Bed Occupancy Rate	☐	☐	☐			☐	☐	☐	☐	☐
			III-44 Daily Average Inpatient Workload per Licensed Physician	☐	☐	☐			☐	☐	☐	☐	☐
			III-45 Physician-to-Nurse Ratio	☐	☐	☐			☐	☐	☐	☐	☐
			III-46 Number of Pharmacists per 100 Hospital Beds	☐	☐	☐			☐	☐	☐	☐	☐
New indicators													
Others													

suggestions	

Table 6 Expert Judgment Table for the Third-level Indicators of Hospital Brand Equity

Serial Number	First-level indicators	Secondary indicators	Third-level indicators	Indicator determination (Mark "√" or fill in the content according to your own judgment)					The importance of indicators (Mark "√" according to your own judgment)				
				Agree	Delete	Modify	Modify to	Reasons for deletion/ modification	Very unimportant (1 point)	Not very unimportant (2 points)	Average (3 points)	Quite important (4 points)	Very important (5 points)
1	I-1Hospital Brand Loyalty	II-1Behavioral loyalty	III-1 Revisit Rate	☐	☐	☐			☐	☐	☐	☐	☐
			III-2Patient Retention Rate	☐	☐	☐			☐	☐	☐	☐	☐
			III-3 Likelihood to Recommend	☐	☐	☐			☐	☐	☐	☐	☐
		II-2Attitude loyalty	III-4 Overall Trust Sensing	☐	☐	☐			☐	☐	☐	☐	☐
			III-5 Relationship Value Sensing	☐	☐	☐			☐	☐	☐	☐	☐
			III-6 Affective Commitment	☐	☐	☐			☐	☐	☐	☐	☐
			III-7 Repurchase Intention	☐	☐	☐			☐	☐	☐	☐	☐
			III-8	☐	☐	☐			☐	☐	☐	☐	☐

			Word-of-Mouth Propagation										
		II-3Crisis support	III-9Willingness to Retain Medical Treatment after Negative Events	☐	☐	☐			☐	☐	☐	☐	☐
			III-10Trust Restoration Willingness	☐	☐	☐			☐	☐	☐	☐	☐
			III-11 Recommendation Restoration Willingness	☐	☐	☐			☐	☐	☐	☐	☐
2	I-2 Hospital Brand Quality	II-4 Technical Quality (Sensing)	III-12 Proportion of Grade IV Surgeries among Discharged Patients	☐	☐	☐			☐	☐	☐	☐	☐
			III-13 Medical Quality Control	☐	☐	☐			☐	☐	☐	☐	☐
			III-14 Incidence of Surgical Complications	☐	☐	☐			☐	☐	☐	☐	☐
			III-15Mortality Rate among Low-Risk Group Cases	☐	☐	☐			☐	☐	☐	☐	☐
		II-5 Functional Quality(Sensing)	III-16 Utilization Rate of Full-Process Self-Service Terminals	☐	☐	☐			☐	☐	☐	☐	☐
			III-17 Timeliness Rate of “Cloud-based Film” Delivery for Examinations and Tests	☐	☐	☐			☐	☐	☐	☐	☐
			III-18 Compliance	☐	☐	☐			☐	☐	☐	☐	☐

			Rate of Barrier-Free Facilities										
			III-19 Compliance Rate of Anti-Slip Floors	☐	☐	☐			☐	☐	☐	☐	☐
			III-20 Clarity of sign guidance	☐	☐	☐			☐	☐	☐	☐	☐
			III-21 Timely Response Rate for Follow-up Visits via Internet Hospital	☐	☐	☐			☐	☐	☐	☐	☐
		II-6Social Responsibility (Sensing)	III-22 Completeness Rate of Medical Service Price Publicity	☐	☐	☐			☐	☐	☐	☐	☐
			III-23 Coverage Rate of Public Welfare Medical Science Popularization Services	☐	☐	☐			☐	☐	☐	☐	☐
			III-24 Medical Support Rate for Vulnerable Groups	☐	☐	☐			☐	☐	☐	☐	☐
3	I-3 Hospital Brand Associations	II-7 Association Attributes	III-25 Technical Competence Sensing	☐	☐	☐			☐	☐	☐	☐	☐
			III-26 Compliance Rate of Treatment Effectiveness	☐	☐	☐			☐	☐	☐	☐	☐
			III-27 Service Response Efficiency	☐	☐	☐			☐	☐	☐	☐	☐
			III-28 Costs Rationality Sensing	☐	☐	☐			☐	☐	☐	☐	☐
			III-29 Quality of Physician-Patient	☐	☐	☐			☐	☐	☐	☐	☐

			Communication										
			III-30 Sense of Acquired Emotional Support	☐	☐	☐			☐	☐	☐	☐	☐
		II-8 Association Intensity	III-31 Memory Retrieval Speed	☐	☐	☐			☐	☐	☐	☐	☐
			III-32 Feature Association Density	☐	☐	☐			☐	☐	☐	☐	☐
			III-33 Emotional Resonance Intensity	☐	☐	☐			☐	☐	☐	☐	☐
		II-9 Association Preference	III-34 Revisit Choice Inclination	☐	☐	☐			☐	☐	☐	☐	☐
			III-35 Differentiating Features Identification	☐	☐	☐			☐	☐	☐	☐	☐
			III-36 Irreplaceability Sensing	☐	☐	☐			☐	☐	☐	☐	☐
4	I-4 Hospital Brand Awareness	II-10Experience Layer Awareness	III-37 Name Awareness / Name Recognition Rate	☐	☐	☐			☐	☐	☐	☐	☐
			III-38 Architectural (Landmark) Recognition / Recognition Rate of Major Hospital Buildings	☐	☐	☐			☐	☐	☐	☐	☐
			III-39 Specialized Disease Treatments Recognition	☐	☐	☐			☐	☐	☐	☐	☐
			III-40 Characteristic Technologies Recognition	☐	☐	☐			☐	☐	☐	☐	☐
			III-41 Characteristic Services Recognition	☐	☐	☐			☐	☐	☐	☐	☐

		II-11Relationship Layer Awareness	III-42 Forwarding Rate of Negative Public Sentiment	☐	☐	☐			☐	☐	☐	☐	☐
			III-43 Interaction Density of User-Generated Content	☐	☐	☐			☐	☐	☐	☐	☐
			III-44 Public Event Awareness	☐	☐	☐			☐	☐	☐	☐	☐
			III-45 Emergency Response Evaluation	☐	☐	☐			☐	☐	☐	☐	☐
		II-12Communication Layer Awareness	III-46 Reach Rate of Science Popularization Content	☐	☐	☐			☐	☐	☐	☐	☐
			III-47 Search Weight Index	☐	☐	☐			☐	☐	☐	☐	☐
			III-48 Content Quality Coefficient	☐	☐	☐			☐	☐	☐	☐	☐
			III-49 Cross-Platform Activity Level	☐	☐	☐			☐	☐	☐	☐	☐
New indicators													
Other													

Suggestions	

5. Please mark "√" on the items you think are appropriate based on your familiarity with the above indicators:

Table 7 Content Familiarity Judgement Table(Please evaluate the familiarity of the above indicators and mark "√" on the options you think are appropriate)

Not familiar☐	not very familiar☐	average☐	relatively familiar☐	very familiar☐

6. Your basis for judging the above indicators:

Table 8 Expert Judgment Basis Table (Please select the basis for the above indicators' judgment and mark"√" on the options you think are appropriate)

Basis for judgment	**The degree of influence on your judgment of the above indicators (only one "√" can be marked for each judgment)**		
Practical experience	☐significant	☐moderate	☐minor
Theoretical analysis	☐significant	☐moderate	☐minor
Understanding of domestic and foreign counterparts	☐significant	☐moderate	☐minor
Intuitive feeling	☐significant	☐moderate	☐minor

7. Your other suggestions for this round of consultation:

Acknowledgement: Once again, thank you sincerely for your support, and I wish you good physical and mental health and happy work!

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Annex F: Scale for Measuring Hospital Dynamic Capabilities and Brand Equity (Second-Round Expert Consultation Form)

Dear Expert:

Hello! The high-quality development of public hospitals depends on the coordinated improvement of dynamic capabilities and brand assets. Constructing a set of scientific and applicable dynamic capability and brand asset measurement index system is of great significance for public hospitals to optimize resource allocation and enhance core competitiveness. Based on the literature analysis and the foundation of previous research, the research team of this study initially constructed a measurement scale for the dynamic capacity and brand assets of public hospitals, which consists of 7 first-level indicators, 24 second-level indicators, and 78 third-level indicators (for details, see Table 1-6). To further improve this indicator system, given that you have long been engaged in research in the fields of health management, medical and health care, medical education, clinical medicine or related areas, and possess rich experience and profound academic attainments, we hereby invite you to serve as a consulting expert for this research. The research team of this study is expected to conduct 2 to 3 rounds of consultations. The collected data will be strictly confidential. Thank you sincerely for your support and guidance.

The instructions for filling out this form are as follows:

1. Please determine whether the indicators at each level are appropriate:

①If you think this “indicator” does not need to be modified, please mark a “√” in the “In Favor” column of the table.

②If you think this “indicator”should be deleted, please mark a “√” in the“Delete” column of the table and fill in the reason in the “Reason for Deletion” column.

③If you think the “indicator name” needs to be modified, please mark a “√” in the "Modification" column of the table and write the modified name and the modification reason in the “Modification Reason” column.

④If you think it is necessary to “add indicators”, please write down the name of the new indicator and the reason for the addition in the table, and mark “√” in the corresponding “importance” section.

⑤If you have any other suggestions, please fill them in the “Other Suggestions” column.

Please respectively determine the “importance of each level of indicators, familiarity with the indicators, and basis for judgment”.

* Feedback methods: ① Email address: 173835393@qq.com; ② Contact: Wechat (wingwing_thankful)

* Completion time: Given the tight schedule of the project, please complete it by August 5th. We sincerely thank you for your support!

* Contact: Zhou Yingyi, Converged Media Center of the GuangdongSecond Provincial General Hospital, Tel: 13925081291, Email: 173835393@qq.com

* Note: The selection criteria for experts consulted by letter: ① Having engaged in research work in the fields of health management, medical and health care, medical education, clinical medicine or related areas for 10 years or more; ② Master's degree or above; ③ Professional and technical title of associate senior or above, or position of deputy director or above; ④Experts who are willing to participate in this research project and can complete at least two rounds of inquiries by letter are not allowed to withdraw halfway.

Research Group on the Framework Architecture of Dynamic Capabilities and Brand Equity of Public Hospitals
July 5th, 2025

1. Basic Information of the Expert:

1.Your gender: ☐Male ☐Female;
2. Your age: years old;
3. Your years of service: years;
4. Your highest academic degree: ☐Master’s degree☐Doctoral student
5. Your professional title:☐Associate Senior; ☐Senior
6. Your position: ☐Assistant to the Director of the department/section ☐Deputy Director of the department/section ☐Department/Section HeadOther positions:
7. Your workplace and department: ☐Higher education institutions; ☐Medical and health institutions ☐Other units:
8. Your work email address: Office Number:

2. Expert Judgment of the First-level Indicators:

Table 1 Expert Judgment Table for the First-Level Indicators of Hospital Dynamic Capacities

Serial Number	First-level indicators	Experts' opinions on the indicators					The importance of indicators (Mark "√" according to your own judgment)				
		Agree	Delete	Modify	Modify to	Reasons for deletion/modification	Very unimportant（1 point）	Not very unimportant（2 points）	Average（3 points）	Quite important（4 points）	Very important（5 points）
1	I-1Sensing Capability	☐	☐	☐			☐	☐	☐	☐	☐
2	I-2Learning Capability	☐	☐	☐			☐	☐	☐	☐	☐
3	I-3Integrative Capability	☐	☐	☐			☐	☐	☐	☐	☐
New Indicators											
Other suggestions											

Table 2 Expert Judgment Table for the First-Level Indicators of Hospital Brand Equity

Serial Number	First-level indicators	Experts' opinions on the indicators					The importance of indicators (Mark "√" according to your own judgment)				
		Agree	Delete	Modify	Modify to	Reasons for deletion/modification	Very unimportant（1 point）	Not very unimportant（2 points）	Average（3 points）	Quite important（4 points）	Very important（5 points）
1	I-1 Hospital Brand Loyalty	☐	☐	☐			☐	☐	☐	☐	☐

2	I-2 Hospital Brand Quality	☐	☐	☐			☐	☐	☐	☐	☐
3	I-3 Hospital Brand Associations	☐	☐	☐			☐	☐	☐	☐	☐
4	I-4 Hospital Brand Awareness	☐	☐	☐			☐	☐	☐	☐	☐
New Indicators											
Other suggestions											

3. Expert Judgment of the Secondary Indicators:

Table 3 Expert Judgment Table for the Secondary Indicators of Hospital Dynamic Capacities

Number	First-level indicators	Secondary indicators	Indicator determination (Mark "√" or fill in the content according to your own judgment)					The importance of indicators (Mark "√"according to your own judgment)				
			Agree	Delete	Modify	Modify to	Reasons for deletion/modification	Very unimportant（1 point）	Not very unimportant（2 points）	Average（3 points）	Quite important （4 points）	Very important （5 points）
1	I-1Sensing Capability	II-1 Patient NeedsIdentification	☐	☐	☐			☐	☐	☐	☐	☐
		II-2 Policy Context Sensing	☐	☐	☐			☐	☐	☐	☐	☐
		II-3 Multidimensional Sensing	☐	☐	☐			☐	☐	☐	☐	☐
2	I-2Learning Capability	II-4 Ways / Contents of Knowledge Acquisition	☐	☐	☐			☐	☐	☐	☐	☐
		II-5 Learning and	☐	☐	☐			☐	☐	☐	☐	☐

		Research Funding										
		II-6 Organizational Learning	☐	☐	☐			☐	☐	☐	☐	☐
		II-7 Learning Effect	☐	☐	☐			☐	☐	☐	☐	☐
		II-8 Human Resources	☐	☐	☐			☐	☐	☐	☐	☐
3	I-3Integrative Capability	II-9 Quality Safety	☐	☐	☐			☐	☐	☐	☐	☐
		II-10 Technology Level	☐	☐	☐			☐	☐	☐	☐	☐
		II-11 Service Process	☐	☐	☐			☐	☐	☐	☐	☐
		II-12 Resource Allocation and Utilization	☐	☐	☐			☐	☐	☐	☐	☐
New Indicators												
Other suggestions												

Table 4 Expert Judgment Table for the Secondary Indicators of Hospital Brand Equity

Number	First-level indicators	Secondary indicators	Indicator determination (Mark "√" or fill in the content according to your own judgment)					The importance of indicators (Mark "√" according to your own judgment)				
			Agree	Delete	Modify	Modify to	Reasons for deletion/modification	Very unimportant（1 point）	Not very unimportant（2 points）	Average（3 points）	Quite important（4 points）	Very important（5 points）
1	I-1Hospital Brand Loyalty	II-1Behavioral loyalty	☐	☐	☐			☐	☐	☐	☐	☐
		II-2Attitude loyalty	☐	☐	☐			☐	☐	☐	☐	☐
		II-3Crisis support	☐	☐	☐			☐	☐	☐	☐	☐

2	I-2 Hospital BrandQuality	II-4 Technical Quality	☐	☐	☐			☐	☐	☐	☐	☐
		II-5 Functional Quality	☐	☐	☐			☐	☐	☐	☐	☐
		II-6Social Responsibility	☐	☐	☐			☐	☐	☐	☐	☐
3	I-3 Hospital Brand Associations	II-7 Association Attributes	☐	☐	☐			☐	☐	☐	☐	☐
		II-8 Association Intensity	☐	☐	☐			☐	☐	☐	☐	☐
		II-9 Association Preference	☐	☐	☐			☐	☐	☐	☐	☐
4	I-4 Hospital Brand Awareness	II-10Experience Layer Awareness	☐	☐	☐			☐	☐	☐	☐	☐
		II-11Relationship Layer Awareness	☐	☐	☐			☐	☐	☐	☐	☐
		II-12Communication Layer Awareness	☐	☐	☐			☐	☐	☐	☐	☐
New Indicators												
Other suggestions												

4. Expert Judgment of the Third-level Indicators:

Table 5 Expert Judgment Table for the Third-level Indicators of Hospital Dynamic Capacities

[Note: The third-level dynamic capabilities indicators include three categories: 1. "National Examination" indicators (marked with ▲); 2. "Provincial Examination" indicators (marked with underline); 3. Indicators designed for this study]

Serial number	First-level indicators	Secondary indicators	Third-level indicators	Indicator determination (mark "√" or fill in the content)					Importance of indicator (mark "√")				
				Agree	delete	Revise	Modified to	Reason for deletion/modification	Very important (5 points)	More important (4 points)	generally (3 points)	Not very important (2 points)	Veryunimportant (1 point)
1	I-1 Sensing Capability	II-1 Patient Needs Identification (Corresponding to III-1 to III-3)	III-1 Sub-specialty (Quaternary Specialty) Development Status	☐	☐	☐			☐	☐	☐	☐	☐
			III-2 Establishment of Specialized Disease Clinics	☐	☐	☐			☐	☐	☐	☐	☐
			III-3 Case Mix Breadth (Number of Diagnosis-Related Groups, DRGs)	☐	☐	☐			☐	☐	☐	☐	☐
		II-2 Policy Context Sensing (corresponding to III-4 to III-7)	III-4 Development Status of Key Specialties Designated by the National Health	☐	☐	☐			☐	☐	☐	☐	☐

			Commission										
			III-5 Internal Organizational Structure in Response to Healthcare Security Reforms	☐	☐	☐			☐	☐	☐	☐	☐
			III-6 Internal Organization and Operational Mechanism for Hospital Operations Management	☐	☐	☐			☐	☐	☐	☐	☐
			III-7 Internal Unit Dedicated to Patient Experience Improvement Policies	☐	☐	☐			☐	☐	☐	☐	☐
		II-3 Multidimensional Sensing (corresponding to III-8 to III-11)	III-8 Proportion of AmbulatorySurgeries	☐	☐	☐			☐	☐	☐	☐	☐
			III-9 Coverage Rate of Wards Providing High-Quality Nursing Services	☐	☐	☐			☐	☐	☐	☐	☐
			III-10 Growth Rate of Average	☐	☐	☐			☐	☐	☐	☐	☐

			Cost per Outpatient Visit▲										
			III-11 Growth Rate of Average Cost per Hospitalization▲	☐	☐	☐			☐	☐	☐	☐	☐
2	I-2 Learning Ability	II-4 Ways / Contents of Knowledge Acquisition (Corresponding to III-12 to III-14)	III-12 Number of New Knowledge and Technology Introductions	☐	☐	☐			☐	☐	☐	☐	☐
			III-13 Frequency of Healthcare Staff Participation in Academic Conferences	☐	☐	☐			☐	☐	☐	☐	☐
			III-14 Completion Status of Continuing Medical Education (CME) Credits	☐	☐	☐			☐	☐	☐	☐	☐
		II-5 Learning and Research Funding (corresponding to	III-15Annual Financial Investment in Learning Resources	☐	☐	☐			☐	☐	☐	☐	☐
			III-16Research Project	☐	☐	☐			☐	☐	☐	☐	☐

		III-15 to III-17)	Funding per 100 Healthcare Technicians ▲										
			III-17Revenue from Research Output Translation per 100 Healthcare Technicians	☐	☐	☐			☐	☐	☐	☐	☐
		II-6 Organizational Learning (corresponding to III-18 to III-19)	III-18Number of Internal Training Sessions Conducted	☐	☐	☐			☐	☐	☐	☐	☐
			III-19Quantity and Outcomes of Innovation Projects	☐	☐	☐			☐	☐	☐	☐	☐
		II-7 Learning Effect (corresponding to III-20 to III-21)	III-20Quantity and Quality of Scientific Research Outputs	☐	☐	☐			☐	☐	☐	☐	☐
			III-21First-Attempt Pass Rate of the National Medical Licensing Examination for Hospital Resident Physicians▲	☐	☐	☐			☐	☐	☐	☐	☐

		II-8 Human Resources (corresponding to III-22 to III-23)	III-22New Appointments as Committee Chairs in Medical Societies/Associations over Three Years	□	□	□			□	□	□	□	□
			III-23Change in Proportion of Doctoral Degree Holders among Healthcare Technicians over Three Years	□	□	□			□	□	□	□	□
3	I-3 Integration Capabilities	II-9 Quality Safety (corresponding to III-24 to III-25)	III-24Incidence of Surgical Complications▲	□	□	□			□	□	□	□	□
			III-25Positive Rate of Major Medical Equipment Examinations	□	□	□			□	□	□	□	□
		II-10 Technology Level (corresponding to III-26 to III-29)	III-26Proportion of Grade IV Surgeries among Discharged Patients▲	□	□	□			□	□	□	□	□
			III-27Proportion of	□	□	□			□	□	□	□	□

			Revenue from Adjunctive Medications (Change over Three Years)										
			III-28Application Level Classification of Electronic Medical RecordFunctions▲	☐	☐	☐			☐	☐	☐	☐	☐
			III-29Energy Consumption Expenditure per 10,000 CNY Revenue (Change over Three Years) ▲	☐	☐	☐			☐	☐	☐	☐	☐
		II-11 Service Process (corresponding to III-30 to III-31)	III-30Average Outpatient Appointment Rate	☐	☐	☐			☐	☐	☐	☐	☐
			III-31Average Post-Appointment Waiting Time for Outpatients	☐	☐	☐			☐	☐	☐	☐	☐
		II-12 Resource Allocation and Utilization (correspond	III-32Bed Occupancy Rate	☐	☐	☐			☐	☐	☐	☐	☐
			III-33Daily Average Inpatient	☐	☐	☐			☐	☐	☐	☐	☐

		ing to III-32 to III-35)	Workload per Licensed Physician										
			III-34Physician-to-Nurse Ratio▲	☐	☐	☐			☐	☐	☐	☐	☐
			III-35Number of Pharmacists per 100 Hospital Beds	☐	☐	☐			☐	☐	☐	☐	☐
New indicators													
Other suggestions													

Table 6 Expert Judgment Table forCorresponding Questionnaire Items for the Third-Level Indicators of Hospital Dynamic Capabilities

Serial Number	Specific questionnaire items	Item determination (mark "√" or fill in the content)				
		Agree	delete	Revise	Modified to	Reason for deletion/modification
1	1. To what extent do the subspecialties within the clinical department cover common and frequently occurring diseases? □ (1 point) □ (2 points) □ (3 points) □ (4 points) □ (5 points) 1 point:The clinical department has only a few basic specialties, lacking dedicated subspecialty coverage for its common diseases. 2points:Covers some high-incidence common diseases, but subspecialty differentiation is coarse and insufficient for segmented needs (e.g., only a "General Internal Medicine" without subdivisions for cardiology, endocrinology, etc.). 3 points:Basically covers the main common and frequently occurring diseases within the department's scope with corresponding subspecialties, meeting conventional diagnostic and	☐	☐	☐		

	treatment demands. 4 points:Comprehensively covers common and frequent diseases with subspecialties, with some areas further subdivided (e.g., an Endocrinology Department hosting dedicated Diabetes and Thyroid clinics). 5 points:Not only comprehensive coverage of common diseases, but also establishes distinctive subspecialties targeting regionally prevalent diseases (e.g., Thalassemia in southern China). (Score 0 if no subspecialties are established.)					
2	2. To what extent do the disease-specific clinics within the clinical department cover common and frequently occurring diseases? □ (1 point) □ (2 points) □ (3 points) □ (4 points) □ (5 points) 1 point:The department operates very few disease-specific clinics for only the most common conditions, covering a minimal range. 2 points:Covers some common high-incidence diseases, but lacks dedicated clinics for several other prevalent conditions. 3 points:Basically covers the common high-incidence diseases within the department's scope with corresponding dedicated clinics for major conditions. 4 points:Comprehensively covers common high-incidence diseases, and includes clinics for some less frequent but high-severity diseases. 5 points:Not only comprehensive coverage, but also establishes disease-specific clinics for conditions uniquely prevalent in the region. (Score 0 if no disease-specific clinics are established.)	☐	☐	☐		
3	3. To what extent does the number of DRG groups managed by the clinical department cover basic common diseases? □ (1 point) □ (2 points) □ (3 points) □ (4 points) □ (5 points) 1 point: The number of DRG groups managed is significantly below the average for comparable departments in peer hospitals, covering only a very limited number of basic common diseases. 2 points:The number is below the average for comparable departments, covering some basic common diseases. 3 points:The number meets the average for comparable departments, basically covering all fundamental common diseases within the department's scope. 4 points:The number exceeds the average for comparable departments, not only covering all basic common diseases comprehensively but also including some uncommon subtypes of common diseases. 5 points:The number is significantly higher than the average for comparable departments, with no apparent gaps in coverage of basic common diseases.	☐	☐	☐		
4	4. To what extent does the clinical department cover nationally mandated key specialty areas? □ (1 point) □ (2 points) □ (3 points) □ (4 points) □ (5 points) 1 point:The department does not cover nationally mandated key specialty areas for	☐	☐	☐		

	development, failing to meet basic patient care needs. 2 points:The department partially covers nationally mandated areas, but with significant gaps, resulting in limited service capacity. 3 points:The department basically covers the main nationally mandated specialty areas, providing common specialized diagnostic and treatment services. 4 points:The department comprehensively covers nationally mandated specialty areas and includes some subspecialized fields, offering more refined services. 5 points:Beyond comprehensive coverage, the department has specifically strengthened key nationally mandated specialties corresponding to regionally high-prevalence diseases.					
5	5. How well-developed is the clinical department's adaptation mechanism for healthcare insurance reform? □ (1 point) □ (2 points) □ (3 points) □ (4 points) □ (5 points) 1 point:No designated personnel handles insurance reform matters; patients face difficulties with reimbursement and inquiries. 2 points:Part-time staff handle insurance affairs but struggle with core aspects like payment reform. 3 points:Dedicated personnel manage insurance, covering basic functions like policy interpretation and reimbursement review. 4 points:An insurance management team/group (e.g., DRG/DIP accounting specialists) is established, capable of addressing specialized reform issues precisely. 5 points:A "Insurance Administrator + Clinical Liaison" mechanism is built, comprehensively covering reform tasks and resolving patient issues in real-time.	☐	☐	☐		
6	6. How well-developed is the clinical department's operational management mechanism? □ (1 point) □ (2 points) □ (3 points) □ (4 points) □ (5 points) 1 point:No operational management mechanism exists; processes are chaotic, with frequent patient problems like appointment difficulty and long wait times for tests. 2 points:A simple operational coordination role exists but is not systematized, only handling basic scheduling. 3 points:A basic operational management mechanism exists, covering functions like process optimization and resource scheduling. 4 points:The operational management mechanism includes specialized teams (e.g., outpatient optimization group) to tackle specific operational problems. 5 points: An "Operations Manager + Clinical Liaison" mechanism is built, capable of collecting and rapidly responding to patient needs in real-time.	☐	☐	☐		
7	7. How well-developed is the clinical department's mechanism for improving patient experience? □ (1 point) □ (2 points) □ (3 points) □ (4 points) □ (5 points) 1 point:No one is responsible for patient experience; problems are prominent and unresolved.	☐	☐	☐		

	2 points:A simple role exists for collecting patient feedback but lacks a systematic processing mechanism. 3 points:A dedicated patient experience manager/administrator handles routine feedback and process improvements. 4 points:A patient experience management team/group addresses key process pain points like registration and payment. 5 point:A collaborative "Patient Experience Manager + Patient Representative" mechanism is built, comprehensively collecting needs and optimizing services.					
8	8. Proportion of day surgery among elective surgeries. This indicator's score is proportionally converted from the corresponding score in the National (or Provincial) Performance Evaluation for third-level public hospitals.	☐	☐	☐		
9	9. Coverage rate of wards providing high-quality nursing services. This indicator's score is proportionally converted from the corresponding score in the National (or Provincial) Performance Evaluation for third-level public hospitals.	☐	☐	☐		
10	10. Increase rate of average outpatient expense per visit. This indicator's score is proportionally converted from the corresponding score in the National (or Provincial) Performance Evaluation for third-level public hospitals.	☐	☐	☐		
11	11. Increase rate of average inpatient expense per admission. This indicator's score is proportionally converted from the corresponding score in the National (or Provincial) Performance Evaluation for third-level public hospitals.	☐	☐	☐		
12	12. In the previous year (2024), how many new knowledge areas or technologies were introduced by the clinical department? □ (1 point) □ (2 points) □ (3 points) □ (4 points) □ (5 points) 1 point:≤3 introductions, primarily basic technologies with minimal involvement in cutting-edge areas. 2 points:4-6 introductions, covering a narrow range of conditions, only addressing some routine diagnostic/treatment issues. 3 points:7-10 introductions, encompassing common technologies for the department, basically meeting daily patient care needs. 4 points:11-15 introductions, featuring diverse technology types, including multi-disciplinary specialty techniques. 5 points:>15 introductions, with a high proportion being cutting-edge technologies, significantly enhancing core diagnostic and treatment capabilities.	☐	☐	☐		
13	13. In the previous year (2024), how many academic conferences did the clinical department's medical staff attend? □ (1 point) □ (2 points) □ (3 points) □ (4 points) □ (5 points) 1 point:Annual attendance ≤10, far below comparable departments, indicating lagging knowledge renewal.	☐	☐	☐		

	2 points:Annual attendance 11-20, below average, indicating slow knowledge renewal. 3 points:Annual attendance 21-30, meeting basic requirements, with relatively timely knowledge updates. 4 points:Annual attendance 31-40, exceeding industry average, covering multi-disciplinary frontier conferences. 5 points:Annual attendance >40, including many high-caliber conferences, closely following technological frontiers.					
14	14. In the previous year (2024), what was the completion status of Continuing Medical Education (CME) credits for the clinical department's medical staff? □ (1 point) □ (2 points) □ (3 points) □ (4 points) □ (5 points) 1 point:Credit attainment rate ≤60%; most staff did not meet annual requirements. 2 points:Attainment rate 60%-75%; nearly half of staff are non-compliant, indicating overall insufficient knowledge renewal. 3 points:Attainment rate 75%-90%; most staff complete credits, with relatively timely knowledge updates. 4 points:Attainment rate 90%-95%; the vast majority are compliant, with continuous knowledge/skill enhancement. 5 points:Attainment rate >95%; essentially all staff complete credits, indicating efficient knowledge/skill renewal.	☐	☐	☐		
15	15. In the previous year (2024), what was the level of investment in learning and research funding for the clinical department? □ (1 point) □ (2 points) □ (3 points) □ (4 points) □ (5 points) 1 point:Annual per capita investment in learning resources < ¥500, indicating severe underfunding. 2 points:Annual per capita investment ¥500-1000, relatively low, leading to slow knowledge renewal. 3 points:Annual per capita investment ¥1001-2000, moderate, able to meet basic learning needs. 4 points:Annual per capita investment ¥2001-3000, relatively sufficient, supporting high-end academic activities. 5 points:Annual per capita investment > ¥3000, sufficient and rationally allocated, facilitating mastery of frontier technologies.	☐	☐	☐		
16	16. Research project funding per 100 health technicians. This indicator’s score is proportionally converted from the corresponding score in the National (or Provincial) Performance Evaluation for third-level public hospitals.	☐	☐	☐		
17	17. Commercialization revenue from research outcomes per 100 health technicians. This indicator’s score is proportionally converted from the corresponding score in the National (or Provincial) Performance Evaluation for third-level public hospitals.	☐	☐	☐		
18	18. In the previous year (2024), how many internal training sessions did the clinical department	☐	☐	☐		

	conduct? □ (1 point) □ (2 points) □ (3 points) □ (4 points) □ (5 points) 1 point:Average ≤5 sessions annually; extremely low frequency, content limited to basic protocols. 2 points:Average 6-10 sessions annually; coverage not comprehensive, mostly routine content. 3 points:Average 11-15 sessions annually; covering basic skills for major disease areas, meeting daily needs. 4 points:Average 16-20 sessions annually; including multi-disciplinary specialized skills, with targeted training. 5 points:Average ≥20 sessions annually; containing diverse content like frontier tech and emergency response, indicating a well-developed training system.					
19	19. Over the past three years (Jan 2022 - Dec 2024), how many research projects did the clinical department undertake? □ (1 point) □ (2 points) □ (3 points) □ (4 points) □ (5 points) 1 point:0-3 projects initiated; minimal outcomes, difficult to translate/applicate. 2 points:4-6 projects initiated; limited outcomes, with little translation/application. 3 points:7-9 projects initiated; some outcomes translated, enhancing basic diagnostic/treatment capabilities. 4points:10-12 projects initiated; good outcome translation, with notable technological innovation. 5points:13-15 (or more) projects initiated; abundant outcomes with significant translation/application, markedly elevating diagnostic/treatment standards. Note: Research projects include: ① Funded vertical/horizontal projects at various levels led by the department, IITs, and collaborative projects with allocated funds. ② Clinical trial projects.	☐	☐	☐		
20	20. Over the past three years (Jan 2022 - Dec 2024), what is the level of the clinical department's research output? □ (1 point) □ (2 points) □ (3 points) □ (4 points) □ (5 points) 1 point:Scarce research output. No national/provincial projects, or only a few unfunded provincial ones. Minimal total publications (≤3), with no SCI papers or only a few low-tier SCI/core Chinese journal papers. 2 points: Limited research output. No national projects, but undertakes 1-2 funded provincial projects. Few publications (4-9), possessing SCI publication capability but primarily in Q3/Q4, with scarce high-quality papers. 3 points:Good research output. Leads 1 national project, or undertakes ≥3 well-funded provincial projects. Publications number 10-15, with a considerable proportion being SCI papers including some Q2 or above. 4 points:Excellent research output. Leads 2-4 well-funded national projects. Prolific publications (14-26), dominated by SCI with stable output in Q1 or TOP journals.	☐	☐	☐		

	5 points:Outstanding research output. Leads far more than 4 national key projects with substantial funding. High volume and quality of publications, overwhelmingly SCI, with sustained high output in Q1 TOP journals, representing domestic leadership.					
21	21. First-time pass rate for the National Medical Licensing Examination for the hospital's resident physicians. This indicator's score is proportionally converted from the corresponding score in the National (or Provincial) Performance Evaluation for third-level public hospitals.	☐	☐	☐		
22	22. In the previous year (2024), how many members of the clinical department held positions as Chairperson, Vice-Chairperson, or Standing Committee Member in provincial-level or above health-related societies/associations? □ (1 point) □ (2 points) □ (3 points) □ (4 points) □ (5 points) 1 point:0 persons. Academic influence needs enhancement; no core roles in major academic societies. 2 point:1 person. Breakthrough in society involvement, beginning to generate initial influence. 3 points:2 persons. Establishing preliminary team influence within societies, possessing stable communication channels. 4 points:3-4 persons. Formed an influential team within societies, or holds important roles in national-level societies, with influence extending beyond the province. 5 points:≥5 persons. Possesses strong voice and leadership in both national and provincial academic societies, recognized as an academic highland in the field.	☐	☐	☐		
23	23. Over the past three years (Jun 2022 - Jun 2025), what is the change in the proportion of doctors with doctoral degrees in the clinical department? □ (1 point) □ (2 points) □ (3 points) □ (4 points) □ (5 points) 1 point:No change or decrease (increase ≤0%). Reflects stagnant or regressing talent structure, lacking mechanisms for high-level talent recruitment/development, indicating a weak foundation for learning capability. 2 points:Increase of 1%-5%. Indicates initial attempts at talent upgrading with limited effect; proportion of PhD holders remains low (typically ≤10%); learning capability improves slowly. 3 points:Increase of 6%-15%, OR final proportion reaches 11%-30%. Shows continuous optimization of talent structure; PhD holders become a significant component; learning capability gradually strengthens. 4 points:Increase of 16%-25%, OR final proportion reaches 31%-50%. Signifies markedly increased talent density; PhD holders approach or exceed one-third; learning capability is relatively strong with improved knowledge translation efficiency. 5 points:Increase ≥26%, OR final proportion ≥51%. Represents a leap in talent structure; PhD holders become the dominant force; outstanding learning capability with advantages in sustained innovation and knowledge integration.	☐	☐	☐		
24	24. Incidence of complications in surgical patients.	☐	☐	☐		

	This indicator's score is proportionally converted from the corresponding score in the National (or Provincial) Performance Evaluation for third-level public hospitals.					
25	25. Positive detection rate for large medical equipment examinations. This indicator's score is proportionally converted from the corresponding score in the National (or Provincial) Performance Evaluation for third-level public hospitals.	☐	☐	☐		
26	26. Proportion of Level IV surgeries among discharged patients. This indicator's score is proportionally converted from the corresponding score in the National (or Provincial) Performance Evaluation for third-level public hospitals.	☐	☐	☐		
27	27. Proportion of revenue from auxiliary medications. This indicator's score is proportionally converted from the corresponding score in the National (or Provincial) Performance Evaluation for third-level public hospitals.	☐	☐	☐		
28	28. Functional grading level of Electronic Medical Record application. This indicator's score is proportionally converted from the corresponding score in the National (or Provincial) Performance Evaluation for third-level public hospitals.	☐	☐	☐		
29	29. Energy consumption expenditure per ¥10,000 revenue. This indicator's score is proportionally converted from the corresponding score in the National (or Provincial) Performance Evaluation for third-level public hospitals.	☐	☐	☐		
30	30. Average rate of appointment-based outpatient visits. This indicator's score is proportionally converted from the corresponding score in the National (or Provincial) Performance Evaluation for third-level public hospitals.	☐	☐	☐		
31	31. Average waiting time after appointment for outpatients. This indicator's score is proportionally converted from the corresponding score in the National (or Provincial) Performance Evaluation for third-level public hospitals.	☐	☐	☐		
32	32. In the previous year (2024), what was the bed occupancy rate of the clinical department? □ (1 point) □ (2 points) □ (3 points) □ (4 points) □ (5 points) 1 point:45% (inclusive) to 55%. Inefficient bed utilization, with excessively long inpatient waiting times. 2 points:55% (inclusive) to 65%. Average bed utilization efficiency, with relatively long patient waits. 3 points:65% (inclusive) to 75%. Moderate bed utilization efficiency, basically meeting inpatient demand. 4 points:75% (inclusive) to 85%. Moderate bed utilization efficiency, with short patient wait times. 5 points:≥85%. Highly efficient bed utilization, ensuring timely patient admission. (Score 0 if below 45%.)	☐	☐	☐		
33	33. Average daily inpatient workload per licensed physician. This indicator's score is proportionally converted from the corresponding score in the National (or Provincial) Performance Evaluation for third-level public hospitals.	☐	☐	☐		

34	34. Nurse-to-Physician ratio. This indicator's score is proportionally converted from the corresponding score in the National (or Provincial) Performance Evaluation for third-level public hospitals.	☐	☐	☐		
35	35. Number of pharmacists per 100 hospital beds. This indicator's score is proportionally converted from the corresponding score in the National (or Provincial) Performance Evaluation for third-level public hospitals.	☐	☐	☐		

Table 7 Expert Judgment Table for the Third-level Indicators of Hospital Brand Equity

Serial number	First-level indicators	Secondary indicators	Third-level indicators	Indicator determination (mark "√" or fill in the content)					Importance of indicator (mark "√")				
				Agree	delete	Revise	Modified to	Reason for deletion/modification	Very important (5 points)	More important (4 points)	generally (3 points)	Not very important (2 points)	Veryunimportant (1 point)
1	I-1 Hospital Brand Loyalty	II-1Behavioral Loyalty	III-1 Revisit Rate	☐	☐	☐			☐	☐	☐	☐	☐
			III-2Patient Retention Rate	☐	☐	☐			☐	☐	☐	☐	☐
			III-3Likelihood to Recommend	☐	☐	☐			☐	☐	☐	☐	☐
		II-2Attitude Loyalty	III-4Overall Trust Sensing	☐	☐	☐			☐	☐	☐	☐	☐
			III-5Relationship Value Sensing	☐	☐	☐			☐	☐	☐	☐	☐
			III-6 Repurchase Intention	☐	☐	☐			☐	☐	☐	☐	☐
			III-7 Word-of-Mouth	☐	☐	☐			☐	☐	☐	☐	☐

			Propagation										
		II-3 Crisis Support	III-8 Willingness to Retain Medical Treatment after Negative Events	☐	☐	☐			☐	☐	☐	☐	☐
			III-9 Trust Restoration Willingness	☐	☐	☐			☐	☐	☐	☐	☐
			III-10 Recommendation Restoration Willingness	☐	☐	☐			☐	☐	☐	☐	☐
2	I-2Hospital Brand Quality	II-4Technical Quality	III-11 Proportion of Grade IV Surgeries among Discharged Patients	☐	☐	☐			☐	☐	☐	☐	☐
			III-12 Mortality Rate among Low-Risk Group Cases	☐	☐	☐			☐	☐	☐	☐	☐
		II-5Functional Quality	III-13 Utilization Rate of Full-Process Self-Service Terminals	☐	☐	☐			☐	☐	☐	☐	☐
			III-14 Timeliness Rate of	☐	☐	☐			☐	☐	☐	☐	☐

			"Cloud-based Film" Delivery for Examinations and Tests										
			III-15 Compliance Rate of Barrier-Free Facilities	☐	☐	☐			☐	☐	☐	☐	☐
			III-16 Compliance Rate of Anti-Slip Floors	☐	☐	☐			☐	☐	☐	☐	☐
			III-17 Clarity of sign guidance	☐	☐	☐			☐	☐	☐	☐	☐
			III-18 Timely Response Rate for Follow-up Visits via Internet Hospital	☐	☐	☐			☐	☐	☐	☐	☐
		II-6 Social Responsibility	III-19 Coverage Rate of Public Welfare Medical Science Popularization Services	☐	☐	☐			☐	☐	☐	☐	☐
			III-20 Medical	☐	☐	☐			☐	☐	☐	☐	☐

			Support Rate for Vulnerable Groups										
3	I-3 Hospital Brand Association	II-7 Association Attributes	III-21 Technical Competence Sensing	☐	☐	☐			☐	☐	☐	☐	☐
			III-22 Compliance Rate of Treatment Effectiveness	☐	☐	☐			☐	☐	☐	☐	☐
			III-23 Service Response Efficiency	☐	☐	☐			☐	☐	☐	☐	☐
			III-24 Costs Rationality Sensing	☐	☐	☐			☐	☐	☐	☐	☐
			III-25 Quality of Physician-Patient Communication	☐	☐	☐			☐	☐	☐	☐	☐
			III-26 Sense of Acquired Emotional Support	☐	☐	☐			☐	☐	☐	☐	☐
		II-8 Association Strength	III-27 Memory Retrieval Speed	☐	☐	☐			☐	☐	☐	☐	☐
			III-28 Feature Association	☐	☐	☐			☐	☐	☐	☐	☐

			Density										
			III-29 Emotional Resonance Intensity	☐	☐	☐			☐	☐	☐	☐	☐
		II-9 Association Preference	III-30 Revisit Choice Inclination	☐	☐	☐			☐	☐	☐	☐	☐
			III-31 Differentiating Features Identification	☐	☐	☐			☐	☐	☐	☐	☐
			III-32 Irreplaceability Sensing	☐	☐	☐			☐	☐	☐	☐	☐
4	I-4 Hospital Brand Awareness	II-10Experience Layer Recognition	III-33 Name Awareness / Name Recognition Rate	☐	☐	☐			☐	☐	☐	☐	☐
			III-34 Architectural (Landmark) Recognition / Recognition Rate of Major Hospital Buildings	☐	☐	☐			☐	☐	☐	☐	☐
			III-35 Specialized Disease Treatments Recognition	☐	☐	☐			☐	☐	☐	☐	☐

			III-36 Characteristic Technologies Recognition	☐	☐	☐			☐	☐	☐	☐	☐
			III-37 Characteristic Services Recognition	☐	☐	☐			☐	☐	☐	☐	☐
		II-11Relationship Layer Recognition	III-38 Forwarding Rate of Negative Public Sentiment	☐	☐	☐			☐	☐	☐	☐	☐
			III-39 Interaction Density of User-Generated Content	☐	☐	☐			☐	☐	☐	☐	☐
			III-40 Public Event Awareness	☐	☐	☐			☐	☐	☐	☐	☐
			III-41 Emergency Response Evaluation	☐	☐	☐			☐	☐	☐	☐	☐
		II-12Communication Layer Recognition	III-42 Search Weight Index	☐	☐	☐			☐	☐	☐	☐	☐
			III-43Content Quality Coefficient	☐	☐	☐			☐	☐	☐	☐	☐
New indicat													

ors													
Other suggestions													

Table 8 Expert Judgment Table forCorresponding Questionnaire Items for the Third-Level Indicators of Hospital Brand Equity

Serial Number	Specific questionnaire items	Item determination (mark "√" or fill in the content)				
		Agree	delete	Revise	Modified to	Reason for deletion/modification
1	1. Number of follow-up visits within the past year: □ 1 time (1 point): Only 1 follow-up visit □ 2 times (2 points): 2 follow-up visits □ 3 times (2 points): 3 follow-up visits □ 4 times (2 points): 4 follow-up visits □ ≥ 5 times (5 points): 5 or more follow-up visits □ 0 times (0 points): No follow-up visit conducted	☐	☐	☐		
2	2. In the next three years, if ongoing medical treatment is required, how likely are you to choose to continue receiving care at this hospital/clinical department? □ Very low (1 point): Highly unlikely; would prioritize transferring to another hospital/department □ Low (2 points): Reluctant; would only choose it if no better options are available □ Neutral (3 points): Acceptable; no strong preference □ High (4 points): Quite willing; it meets most of my needs □ Very high (5 points): Definitely continue; high level of trust and dependence	☐	☐	☐		
3	3. How likely are you to recommend this hospital/clinical department to relatives or friends? □ Very low (1 point): Would not recommend; multiple significant issues □ Low (2 points): Rarely recommend; many aspects need improvement □ Neutral (3 points): Might consider recommending; no notable strengths □ High (4 points): Willing to recommend; has commendable strengths worth sharing □ Very high (5 points): Highly recommend; strong trust and actively share positive experiences	☐	☐	☐		
4	4. To what extent do you trust this hospital/clinical department? □ Very low (1 point): No trust at all; believe serious problems exist □ Low (2 points): Low level of trust; significant doubts about technical competence and service □ Neutral (3 points): Moderately trust; have some recognition but also concerns □ High (4 points): Quite trusting; recognize the medical standards and service attitude □ Very high (5 points): Complete trust; highly rely on and feel assured entrusting my health to them	☐	☐	☐		
5	5. Do you feel respected and valued in the patient-doctor relationship?	☐	☐	☐		

	□ Not at all (1 point): Feel completely disrespected and undervalued □ Seldom (2 points): Occasionally felt respected, but overall experience is poor □ Sometimes (3 points): Feel moderately respected; experience varies □ Often (4 points): Frequently feel respected and valued □ Always (5 points): Always feel respected and valued					
6	6. If the same condition recurs, how likely are you to choose this hospital/clinical department as your first option? □ Very low (1 point): Would not choose; would prioritize another hospital/department □ Low (2 points): Unlikely to choose; have concerns about receiving treatment here again □ Neutral (3 point): Would depend on the situation; no strong preference □ High (4 points): Very likely to choose; recognize its strengths □ Very high (5 points): Would definitely choose; high level of dependence and trust	☐	☐	☐		
7	7. In the past six months, how often have you actively praised this hospital/clinical department to others? □ Almost never (1 point): 0 times □ Occasionally (2 points): 1-2 times □ Sometimes (3 points): 3-5 times □ Often (4 points): Fairly often (approximately 6-9 times) □ Very frequently (5 points): Frequently and actively recommend (10 times or more)	☐	☐	☐		
8	8. In the event of a medical dispute (non-major incident), how willing would you be to continue receiving care at this hospital/clinical department? □ Unwilling (1 point): No longer trust; would transfer immediately □ Low willingness (2 points): Would carefully consider transferring; doubtful about resolution capabilities □ Neutral (3 points): Would defer decision pending observation of how the situation is handled □ Willing (4 points): Believe it can be properly resolved; would continue treatment □ Very willing (5 points): Complete trust; firmly choose to continue	☐	☐	☐		
9	9. After the dispute is resolved, how willing are you to restore your trust in this hospital/clinical department? □ Very low (1 point): Unable to restore; completely lost trust □ Low (2 points): Difficult to restore; requires concrete proof through actions □ Neutral (3 points): Adopt a wait-and-see attitude; depends on subsequent performance □ High (4 points): Willing to restore; acknowledge resolution and improvements □ Very high (5 points): Fully restored; trust has even strengthened	☐	☐	☐		
10	10. After the dispute is resolved, how likely are you to resume recommending this hospital/clinical department? □ Very low (1 point): Completely lost trust; would not recommend □ Low (2 points): Resolution did not meet expectations; unlikely to recommend	☐	☐	☐		

	□ Neutral (3 points): Adopt a wait-and-see stance; depends on subsequent improvements □ High (4 points): Resolution was proactive and effective; willing to recommend □ Very high (5 points): Very satisfied; would actively and consistently recommend					
11	11. Are you aware of the complex/high-difficulty surgeries performed in this hospital/clinical department? □ Not at all aware (1 point): Completely unaware □ Slightly aware (2 points): Have heard but not certain □ Somewhat aware (3 points): Know about it but unclear on specifics □ Basically informed (4 points): Understand the main types of surgeries □ Very clear (5 points): Fully understand the details of the surgeries	☐	☐	☐		
12	12. How would you rate the level of medical safety in this hospital/clinical department? □ Very low (1 point): Frequent incidents; poor safety management □ Low (2 points): Some hidden risks; safety issues occur often □ Moderate (3 points): Generally safe but room for improvement □ High (4 points): Well-managed; feel assured during visits □ Very high (5 points): Strict management; zero incident record	☐	☐	☐		
13	13. How often do you use self-service machines (for registration/payment/reports)? □ Very rarely (1 point): Never use □ Rarely (2 points): Seldom use; only in special cases □ Occasionally (3 points): Use sometimes □ Frequently (4 points): Use often; handle most transactions via self-service machines □ Very frequently (5 points): Use self-service machines whenever possible	☐	☐	☐		
14	14. How timely do you receive cloud-based imaging reports from this hospital/clinical department? □ Severely delayed (1 point): Always significantly delayed □ Often delayed (2 point): Frequently not received on time □ Mostly on time (3 points): Usually received within expected time □ Quite timely (4 points): Generally received quickly □ Real-time push (5 points): Reports are pushed immediately and received promptly	☐	☐	☐		
15	15. How accessible are the wheelchair ramps/braille pathways and other facilities in this hospital/clinical department? □ Completely inaccessible (1 point): Blocked or severely damaged; cannot be used normally □ Not very accessible (2 points): Often obstructed or flawed; relatively difficult to use □ Moderately accessible (3 points): Basically usable but with some inconveniences or defects □ Quite accessible (4 points): Unobstructed and standard; no significant barriers; easy to use □ Highly accessible (5 points): Well-designed and smooth; greatly facilitate user movement	☐	☐	☐		
16	16. How would you rate the slip resistance safety of floors in this hospital/clinical department? □ Very hazardous (1 point): Floors are slippery; high risk of falling; poor safety □ Somewhat hazardous (2 points): Some areas lack slip resistance; slipping risks exist	☐	☐	☐		

	□ Moderately safe (3 points): Generally safe, but still risky in wet conditions □ Quite safe (4 points): Proper anti-slip measures in place; relatively safe to walk □ Very safe (5 points): Excellent slip resistance; fully ensured safety					
17	17. Are the guidance signs/wayfinding boards in this hospital/clinical department clear and easy to understand? □ Very confusing (1 point): Signs are chaotic and illogical; very difficult to follow □ Not very clear (2 points): Guidance is vague; poorly placed; hard to use □ Basically clear (3 points): Mostly understandable but with room for improvement □ Quite clear (4 points): Well-designed; directions are clear; easy to navigate □ Very clear (5 points): Clear and intuitive; prominently placed; highly efficient guidance	☐	☐	☐		
18	18. How timely are the responses to online follow-up consultations in this hospital/clinical department? □ Over 48 hours (1 point): Responses take over 48 hours; severely delayed □ 24–48 hours (2 points): Responses within 24–48 hours; relatively slow □ 12–24 hours (3 points): Responses within 12–24 hours; average speed □ 2–12 hours (4 points): Responses within 2–12 hours; fairly quick □ Within 2 hours (5 points): Responses within 2 hours; highly efficient	☐	☐	☐		
19	19. Have you been exposed to health lectures/educational materials from this hospital/clinical department? □ Never (1 point): Never encountered any related lectures or materials □ Rarely (2 points): Exposed only once; left little impression □ Occasionally (3 points): Exposed 1–2 times; somewhat beneficial □ Quite often (4 points): Exposed 2–3 times; content was practical and helpful □ Frequently (5 points): Exposed ≥3 times; highly beneficial	☐	☐	☐		
20	20. Have you observed special considerations for the elderly/people with disabilities in this hospital/clinical department? □ None (1 point): No special facilities; extremely inconvenient □ Very few (2 points): Only minimal basic facilities; inadequate for needs □ Some (3 points): Basic facilities available but not comprehensive; still some inconvenience □ Quite a few (4 points): Facilities available in most areas; details could be improved □ Fully covered (5 points): Comprehensive and well-designed facilities; excellent barrier-free experience	☐	☐	☐		
21	21. How would you rate the professional competence of physicians in this hospital/clinical department? □ Highly unprofessional (1 point): Weak foundational knowledge and insufficient experience; unable to practice independently □ Below average (2 points): Incomplete knowledge; not yet proficient in routine operations □ Average (3 points): Capable of handling routine cases independently; moderate ability to manage	☐	☐	☐		

	complex situations □ Quite professional (4 points): Solid knowledge and extensive experience; skilled in managing both common and complex cases □ Top-level (5 points): Outstanding experience and technical excellence; highly efficient in resolving difficult and severe cases					
22	22. To what extent did the actual treatment effectiveness meet your expectations? □ Far below expectations (1 point): Symptoms worsened after treatment; completely contrary to expected improvement □ Below expectations (2 points): Some symptom relief, but significant discomfort remains; improvement did not meet expectations □ Met expectations (3 points): Noticeable symptom improvement; generally consistent with expected level and pace of recovery □ Exceeded expectations (4 points): Good symptom improvement; recovery better than expected □ Far exceeded expectations (5 points): Symptoms almost completely resolved; excellent physical condition; greatly surpassed pre-treatment expectations	☐	☐	☐		
23	23. How long was the waiting time for registration/medication pickup/examinations in this hospital/clinical department? □ Extremely long (1 point): Extremely time-consuming; seriously delayed subsequent schedules □ Quite long (2 points): Long waiting time; significantly negatively affected the medical experience □ Moderate (3 points): Waiting time acceptable □ Relatively short (4 points): Waiting time reasonable and tolerable □ Very short (5 points): Almost no long waiting; highly efficient process	☐	☐	☐		
24	24. How well do the medical costs align with the service quality in this hospital/clinical department? □ Poor value (1 point): High cost, poor service, unsatisfactory experience □ Slightly mismatched (2 points): Slightly high cost with average service □ Basically matched (3 points): Cost matches service; meets expectations □ Well matched (4 points): Reasonable cost with good service □ Excellent value (5 points): Reasonable cost, high-quality service, exceeded expectations	☐	☐	☐		
25	25. Did the doctors explain the medical condition patiently and clearly? □ Perfunctory (1 point): Doctor was indifferent and explained briefly; patient felt unable to ask further questions □ Somewhat impatient (2 points): Doctor explained hastily, spoke quickly, and did not emphasize important information □ Neutral attitude (3 points): Doctor spoke calmly, explained normally, responded to some questions, but with limited depth □ Patient and detailed (4 points): Doctor listened attentively, answered all questions, and explained in an understandable manner □ Thorough and clear (5 points): Doctor explained patiently with aids like cases or diagrams; patient	☐	☐	☐		

	fully understood					
26	26. Did the medical staff in this hospital/clinical department provide psychological support? □ No support at all (1 point): Showed no concern; offered no comfort □ Minimal support (2 points): Occasionally provided reassurance, but rather perfunctory □ Moderate support (3 points): Proactively inquired and offered simple comfort □ Quite proactive (4 points): Often took initiative to reassure and encourage □ Extremely caring (5 points): Provided continuous proactive care and comprehensive support	☐	☐	☐		
27	27. Can you quickly recall the details of your visit to this hospital/clinical department? □ Completely forgotten (1 point): No memory of the entire visit process □ Vague memory (2 points): Only remember having been there; cannot recall specific details □ Some impression (3 points): Remember key steps, but details are unclear □ Quite clear (4 points): Can clearly recall main procedures and key instructions □ Extremely vivid (5 points): All details are deeply impressed and clear as yesterday	☐	☐	☐		
28	28. How many keywords come to mind when you think of this hospital/clinical department? □ 0 keywords (1 point): No impression; lacks basic awareness □ 1–2 keywords (3 points): Basic awareness (e.g., location, name) □ ≥3 keywords (5 points): In-depth understanding (e.g., specialty departments, experts)	☐	☐	☐		
29	29. How strong is your emotional connection to this hospital/clinical department? □ No feeling (1 point): No emotional attachment; view it as an ordinary place □ Slight impression (2 points): Vague memory but no emotional resonance □ Mildly touched (3 points): Slight emotional response due to certain details (e.g., staff care) □ Growing attachment (4 points): Developed trust and positive feelings through multiple contacts; willing to recommend □ Strong identification (5 points): Strong sense of belonging; highly identify with and actively uphold its reputation	☐	☐	☐		
30	30. Compared to other hospitals, how inclined are you to choose this hospital/clinical department for follow-up visits? □ Definitely not (1 point): Would not consider returning under any circumstances □ Slightly inclined (2 points): Usually not a priority; relatively unlikely □ Neutral (3 points): Would consider if conditions are suitable □ Quite inclined (4 points): Would prioritize unless there are special reasons □ Absolute first choice (5 points): Unconditionally prefer; would not consider others	☐	☐	☐		
31	31. Compared to other hospitals, how clearly can you identify the unique features of this hospital/clinical department? □ Not at all (1 point): Unable to identify any distinctive features □ Somewhat difficult (2 points): Difficult to recognize significant characteristics □ Neutral (3 points): Can notice some differences, but they are not prominent or easily confused □ Relatively easy (4 points): Can relatively easily identify noticeable features in multiple aspects	☐	☐	☐		

	□ Very clear (5 points): Very familiar with distinct features in all aspects; can differentiate instantly					
32	32. Do you consider this hospital/clinical department irreplaceable? □ Easily replaceable (1 point): No distinctive features; experience is no different from other hospitals □ Somewhat replaceable (2 points): Slightly distinctive, but easily imitated by other hospitals □ Somewhat difficult to replace (3 points): Clearly distinctive; other hospitals/departments would need considerable effort to match □ Difficult to replace (4 points): Unique system; other hospitals would find it hard to surpass in the short term □ Completely irreplaceable (5 points): Truly unique; provides value unavailable elsewhere	□	□	□		
33	33. Can you accurately state the full name of this hospital/clinical department? □ Incorrect (1 point): Completely unaware □ Vaguely correct (2 points): Have a vague impression but cannot state it accurately □ Partially correct (3 points): Can state part of the name but not the full title □ Mostly accurate (4 points): Can accurately state the full name □ Fully accurate (5 points): Can accurately state the full name and understand its meaning	□	□	□		
34	34. Can you describe the iconic building/logo of this hospital/clinical department? □ Unable to describe (1 point): No impression at all □ Faint impression (2 points): Only a vague sense; cannot recall details □ Vague description (3 points): Can recall some elements but description is incomplete or inaccurate □ Mostly accurate (4 points): Can describe most features with only minor inaccuracies □ Accurate description (5 points): Can fully and accurately describe all details	□	□	□		
35	35. Can you name at least one key department in this hospital/clinical department? □ Completely unaware (1 point): Do not know any key departments □ Aware of existence only (2 points): Know key departments exist but cannot name any □ Know the field (3 points): Understand the general field but cannot provide exact names □ Relatively familiar (4 points): Can accurately name at least one key department □ Well informed (5 points): Can name departments and describe their specialties, experts, etc.	□	□	□		
36	36. Are you aware of any specialized techniques (e.g., minimally invasive surgery) offered by this hospital/clinical department? □ Not at all aware (1 point): Unaware of any specialized techniques □ Slightly aware (2 points): Have heard of specialized techniques but do not know specifics □ Know the name (3 points): Can name the technique but do not understand details □ Partially understand (4 points): Know the basic applications and advantages □ Fully understand (5 points): Clear about the principles, procedures, and applicable conditions	□	□	□		
37	37. Are you aware of any specialized services (e.g., multidisciplinary consultation) offered by this hospital/clinical department? □ Not at all aware (1 point): Unaware of any specialized services □ Slightly aware (2 points): Have heard of specialized services but do not know specifics	□	□	□		

	□ Know the name (3 points): Can name the service but do not understand details □ Understand the content (4 points): Know the service content and process but have not experienced it □ Have personal experience (5 points): Have used the service and understand its process and value					
38	38. If you saw negative news about this hospital/clinical department, how likely would you be to share it? □ Share immediately (1 point): Would share without verifying authenticity □ Share after skimming (2 points): Would briefly review content and share without verification □ Share after partial verification (3 points): Would verify some information before possibly sharing □ Share only after full verification (4 points): Would share only after detailed verification □ Would never share (5 points): Would not share under any circumstances	☐	☐	☐		
39	39. How often do you comment on or like this hospital/clinical department's social media content? □ Very rarely (1 point): Never comment or like; completely uninvolved □ Rarely (2 points): At most once per month; very low engagement □ Occasionally (3 points): About 1-2 times per week; interact when interested □ Frequently (4 points): 3-5 times per week; regularly view and interact □ Very frequently (5 points: Almost daily interaction; highly active and engaged	☐	☐	☐		
40	40. Are you aware of public events involving this hospital/clinical department (e.g., COVID-19 response efforts)? □ Not at all aware (1 point): Have never heard of any related events □ Slightly aware (2 points): Have heard of events but know no details □ Vaguely aware (3 points): Know about involvement but not specific work □ Partially aware (4 points): Know some specific work or roles □ Fully aware (5 points): Clear about specific details and outcomes	☐	☐	☐		
41	41. How confident are you in this hospital/clinical department's ability to handle emergencies (e.g., power outages)? □ Very low (1 point): No confidence at all; poor emergency response □ Low (2 points): Weak confidence; measures are often superficial □ Neutral (3 points): Moderate confidence; effectiveness is uncertain □ High (4 points): Strong confidence; measures are scientific and effective □ Very high (5 points): Full confidence; can quickly control the situation	☐	☐	☐		
42	42. How many times have you searched for information about this hospital/clinical department in the past six months? □ 0 times (0 points) □ 1 time (1 point): Searched occasionally; low level of attention □ 2 times (2 points): Searched infrequently; low intention □ 3 times (3 points): Searched multiple times; relatively attentive □ 4 times (4 points): Searched frequently; actively seeking information	☐	☐	☐		

	□ ≥5 times (5 points): Highly attentive; search very often					
43	43. How useful is the popular science/news content released by this hospital/clinical department? □ Very low (1 point): Content is useless; no help at all □ Low (2 points): Information is superficial; limited practicality □ Neutral (3 points): Generally useful but room for improvement □ High (4 points): Relevant to needs; clear and practical explanations □ Very high (5 points): Forward-looking content; highly instructive and significantly helpful	☐	☐	☐		

5. Please mark "√" on the items you think are appropriate based on your familiarity with the above indicators:

Table 7 Content Familiarity Judgement Table(Please evaluate the familiarity of the above indicators and mark "√" on the options you think are appropriate)

very familiar☐	relatively familiar☐	average☐	not very familiar☐	Not familiar☐

6. Your basis for judging the above indicators:

Table 8 Expert Judgment Basis Table (Please select the basis for the above indicators' judgment and mark"√" on the options you think are appropriate)

Basis for judgment	**The degree of influence on your judgment of the above indicators (only one "√" can be marked for each judgment)**		
Practical experience	☐significant	☐moderate	☐minor
Theoretical analysis	☐significant	☐moderate	☐minor
Understanding of domestic and foreign counterparts	☐significant	☐moderate	☐minor
Intuitive feeling	☐significant	☐moderate	☐minor

7. Your other suggestions for this round of consultation:

Acknowledgement: Once again, thank you sincerely for your support, and I wish you good physical and mental health and happy work!

Annex G: First-Round Expert Consultation on Tertiary Indicators of Hospital Dynamic Capabilities

Tertiary Indicators of Dynamic Capabilities in Public Hospitals (First Round)	Mean Score of Expert-Perceived Importance Level of the Indicator	Proportion of Experts Recommending Deletion or Modification	Consolidated Expert Consensus
III-1 Sub-specialty (Quaternary Specialty) Development Status	4.7	0.00%	Retain
III-2 Establishment of Specialized Disease Clinics	4.733333333	5.88%	Retain
III-3 Case Mix Breadth (Number of Diagnosis-Related Groups, DRGs)	4.833333333	0.00%	Retain
III-4 Proportion of Premium (or Private) Medical Services	2.9	23.33%	Delete
III-5 Average Outpatient Appointment Rate	3	20.00%	Delete
III-6 Average Post-Appointment Waiting Time for Outpatients	2.933333333	20.00%	Delete
III-7 Development Status of Key Specialties Designated by the National Health Commission	4.733333333	0.00%	Retain
III-8 Internal Organizational Structure in Response to Healthcare Security Reforms	4.8	0.00%	Retain
III-9 Internal Organization and Operational Mechanism for Hospital Operations Management	4.766666667	0.00%	Retain
III-10 Quality Control Performance for Single-Disease Diagnoses	3	23.33%	Delete
III-11Physician-to-Nurse Ratio	4.1	20.00%	Delete
III-12 Internal Unit Dedicated to Patient Experience Improvement Policies	4.666666667	0.00%	Retain
III-13 Provision of Ambulatory Chemotherapy Services	3.933333333	23.33%	Delete
III-14 Proportion of AmbulatorySurgeries	4.766666667	0.00%	Retain
III-15 Implementation Status of Tiered Healthcare Delivery System	4.066666667	20.00%	Delete
III-16 Coverage Rate of Wards Providing High-Quality Nursing Services	4.8	0.00%	Retain
III-17 Growth Rate of Average Cost per Outpatient Visit	4.533333333	6.67%	Retain
III-18 Growth Rate of Average Cost per Hospitalization	4.533333333	6.67%	Retain

III-19 Number of New Knowledge and Technology Introductions	4.833333333	0.00%	Retain
III-20 Frequency of Healthcare Staff Participation in Academic Conferences	4.5	6.67%	Retain
III-21 Completion Status of Continuing Medical Education (CME) Credits	4.333333333	6.67%	Retain
III-22 Annual Financial Investment in Learning Resources	4.633333333	3.33%	Retain
III-23 Research Project Funding per 100 Healthcare Technicians	4.466666667	10.00%	Retain
III-24 Revenue from Research Output Translation per 100 Healthcare Technicians	4.466666667	10.00%	Retain
III-25 Number of Internal Training Sessions Conducted	4.6	0.00%	Retain
III-26 Quantity and Outcomes of Innovation Projects	4.733333333	5.88%	Retain
III-27Quantity and Quality of Scientific Research Outputs	4.833333333	0.00%	Retain
III-28 Clinical Application Rate of New Technologies and Therapies	4.1	20.00%	Delete
III-29 First-Attempt Pass Rate of the National Medical Licensing Examination for Hospital Resident Physicians	4.8	0.00%	Retain
III-30 Newly Recruited Key Talents at Various Levels over Three Years	4.1	20.00%	Delete
III-31 New Appointments as Committee Chairs in Medical Societies/Associations over Three Years	4.3	10.00%	Retain
III-32 Change in Proportion of Doctoral Degree Holders among Healthcare Technicians over Three Years	4.666666667	3.33%	Retain
III-33 Performance in Medical Talent Training and Education	3.966666667	20.00%	Delete
III-34 Incidence of Surgical Complications	4.833333333	0.00%	Retain
III-35 Positive Rate of Major Medical Equipment Examinations	4.633333333	3.33%	Retain
III-36 Maintenance, Repair, and Quality Control Management of Major Medical Equipment	3.6	23.33%	Delete
III-37 Proportion of Grade IV Surgeries among Discharged Patients	4.8	0.00%	Retain
III-38 Proportion of Revenue from Adjunctive Medications (Change over Three Years)	4.6	3.33%	Retain
III-39 Application Level Classification of Electronic Medical Record Functions	4.733333333	0.00%	Retain

III-40 Energy Consumption Expenditure per 10,000 CNY Revenue (Change over Three Years)	4.466666667	3.33%	Retain
III-41 Average Outpatient Appointment Rate	4.466666667	3.33%	Retain
III-42 Average Post-Appointment Waiting Time for Outpatients	4.466666667	3.33%	Retain
III-43 Bed Occupancy Rate	4.7	3.33%	Retain
III-44 Daily Average Inpatient Workload per Licensed Physician	4.8	0.00%	Retain
III-45 Physician-to-Nurse Ratio	4.6	6.67%	Retain
III-46 Number of Pharmacists per 100 Hospital Beds	4.6	0.00%	Retain

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Annex H: First-Round Expert Consultation on Tertiary Indicators of Hospital Brand Equity

Tertiary Indicators of Brand Equity in Public Hospitals (First Round)	Mean Score of Expert-Perceived Importance Level of the Indicator	Proportion of Experts Recommending Deletion or Modification	Consolidated Expert Consensus
III-1 Revisit Rate	4.766666667	3.33%	Retain
III-2Patient Retention Rate	4.8	0.00%	Retain
III-3 Likelihood to Recommend	4.833333333	0.00%	Retain
III-4 Overall Trust Sensing	4.733333333	0.00%	Retain
III-5 Relationship Value Sensing	4.566666667	0.00%	Retain
III-6 Affective Commitment	3.933333333	23.33%	Delete
III-7 Repurchase Intention	4.6	10.00%	Retain
III-8 Word-of-Mouth Propagation	4.833333333	0.00%	Retain
III-9Willingness to Retain Medical Treatment after Negative Events	4.733333333	0.00%	Retain
III-10Trust Restoration Willingness	4.8	0.00%	Retain
III-11 Recommendation Restoration Willingness	4.733333333	0.00%	Retain
III-12 Proportion of Grade IV Surgeries among Discharged Patients	4.6	3.33%	Retain
III-13 Medical Quality Control	4.2	20.00%	Delete
III-14 Incidence of Surgical Complications	4.033333333	23.33%	Delete
III-15Mortality Rate among Low-Risk Group Cases	4.866666667	0.00%	Retain
III-16 Utilization Rate of Full-Process Self-Service Terminals	4.733333333	0.00%	Retain
III-17 Timeliness Rate of “Cloud-based Film” Delivery for Examinations and Tests	4.7	0.00%	Retain
III-18 Compliance Rate of Barrier-Free Facilities	4.7	0.00%	Retain
III-19 Compliance Rate of Anti-Slip Floors	4.766666667	0.00%	Retain
III-20 Clarity of sign guidance	4.633333333	0.00%	Retain
III-21 Timely Response Rate for Follow-up Visits via Internet Hospital	4.8	0.00%	Retain
III-22 Completeness Rate of Medical Service Price Publicity	3	20.00%	Delete
III-23 Coverage Rate of Public Welfare Medical Science Popularization Services	4.566666667	3.33%	Retain
III-24 Medical Support Rate for Vulnerable Groups	4.6	3.33%	Retain
III-25 Technical Competence Sensing	4.866666667	0.00%	Retain

III-26 Compliance Rate of Treatment Effectiveness	4.766666667	0.00%	Retain
III-27 Service Response Efficiency	4.733333333	0.00%	Retain
III-28 Costs Rationality Sensing	4.8	0.00%	Retain
III-29 Quality of Physician-Patient Communication	4.766666667	0.00%	Retain
III-30 Sense of Acquired Emotional Support	4.6	0.00%	Retain
III-31 Memory Retrieval Speed	4.433333333	6.67%	Retain
III-32 Feature Association Density	4.5	6.67%	Retain
III-33Emotional Resonance Intensity	4.5	0.00%	Retain
III-34 Revisit Choice Inclination	4.8	0.00%	Retain
III-35 Differentiating Features Identification	4.7	0.00%	Retain
III-36 Irreplaceability Sensing	4.766666667	0.00%	Retain
III-37 Name Awareness / Name Recognition Rate	4.766666667	0.00%	Retain
III-38 Architectural (Landmark) Awareness / Recognition Rate of Major Hospital Buildings	4.7	0.00%	Retain
III-39 Specialized Disease Treatments Awareness	4.766666667	3.33%	Retain
III-40 Characteristic Technologies Awareness	4.866666667	0.00%	Retain
III-41Characteristic ServicesAwareness	4.833333333	0.00%	Retain
III-42 Forwarding Rate of Negative Public Sentiment	4.8	0.00%	Retain
III-43 Interaction Density of User-Generated Content	4.666666667	0.00%	Retain
III-44 Public Event Awareness	4.766666667	0.00%	Retain
III-45 Emergency Response Evaluation	4.8	0.00%	Retain
III-46 Reach Rate of Science Popularization Content	3.9	20.00%	Delete
III-47 Search Weight Index	4.566666667	0.00%	Retain
III-48 Content Quality Coefficient	4.8	0.00%	Retain
III-49 Cross-Platform Activity Level	4	20.00%	Delete