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The Success Key Factors of Medical Institutes in China

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Abstract

With the rapid change of medical institution market in China, managers must make the right corresponding strategies quickly in this unprecedented highly competitive era. Therefore, this study is based on the concept of successful key factors to design and manage medical institutions and other related strategies. This research adopts the expert questionnaire design, taking the medical institution managers in China as the main research object to understand the key factors of the success of medical institutions in China through the questionnaire. This research can effectively help managers understand the interaction between the key factors in the success of medical institutes through further analysis of ISM. It also can be a reference of decision-making in the management of medical industry in China.

JEL classification number: M10
Keywords: Strategy Management, Success Key Factors, Medical Institutes

1 Introduction

With the development of economy and improvement of the level of education in

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China, people have placed greater emphasis on healthcare. As a result, the demand for medical care is growing. The Chinese government has described its plan for the medical market in Chapter 34 “Improving Basic Healthcare System” of its “12th Five-Year Plan”, including: to strengthen the public health service system, to improve the control and prevention of major diseases, to strengthen the construction of urban and rural medical health services system, to improve medical insurance system and pharmaceutical supply system as well as to promote the reform of public hospitals in an active and steady manner.

During the"12th Five-Year" phase, both the number of medical institutes and the number of medical practitioners have been in the growth stage. According to the announcement of National Economic and Social Development Statistics Bulletin in [2]2013 and 2014 by China National Bureau of Statistics, the number of medical and health institutions increased from 973,597 in 2013 to 982,443 in 2014. The number of doctors and assistant doctors went up from 2.79 million to 2.82 million; the number of registered nurses increased from the original 2.78 million to 2.92 million. Moreover, the number of beds in medical institutes grew substantially from 6.18 million to 6.52 million. In comparison to the rate of change of consumer prices, the rate of growth of spending health care and personal products was 1.3% in both 2013 and 2014. It can be inferred that the medical market is still growing and attracting entrants at this stage. It is foreseeable that the competition in Chinese medical market will be intense in the near future.

As a follow-up, the "13th Five-Year Plan" was passed in October 2015. More contents on building a more equitable and sustainable social security system and promoting the establishment of a healthy China were proposed. More specifically, the government proposed the following: to further the reform of the medical system, to implement the link among medical care, medical insurance and pharmacy, to promote the separation of medical treatment and pharmacy, to implement hierarchical clinical treatment, to establish basic medical and healthcare system and modern hospital management for rural and urban areas, to promote comprehensive reform of public hospitals, to maintain the non-profit

[2] Statistical Communiqué of the People’s Republic of China on the 2014 National、Statistical Communiqué of the People’s Republic of China on the 2013 National。http://www.stats.gov.cn/tjsj/zxfb/201502/t20150226_685799.html

attribute of medical systems, to abolish the for-profit mechanisms, and to establish a remunerations system consistent with the medical industry. Therefore, the medical institutes in China must seek for resources legally for sustainable development.

Moreover, people's greater awareness of patients' rights has subjected medical institutes to greater pressure and competition. The medical institutes face the following serious issues: How to satisfy the market's demand for medical services? How to evaluate the limitation on the medical care costs and resources? How to effectively promote service qualities while managing cost and efficiency? The medical companies should develop more effective business strategies in response to changes in the market environment. [3]The business strategies adapted by the medical institutes are becoming increasingly important when facing greater challengers. Therefore, we introduce business theoretical models into the medical industry to help the medical institutes enhance their operational performance [14].

However, from the management's point of view, there must be oppositions against the pursuit of operating efficiency, efficient resource allocation and Cost Control. Moreover, the reform would impact the perception of medical practitioners, thereby causing internal frictions and influencing the overall operating efficiency. Therefore, medical services and products provided by medical institutes are different from the traditional commercial products. The medial industry has its own special properties, including unpredictable risks of diseases, strained relationship between doctors and patients, and supply-induced demand due to information asymmetry. In addition, since the industry is dominated by service providers, the mentality of service receivers is also different from the providers. For example, The Roemer's law [30] states that "in an insured population, a hospital bed built is a filled bed," indicating that most patients are prone to accepting the suggestions given by the professionals.

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[3] For example, creating a Value Chain and new Business Model. Creating a value chain refers to building a new internal process that could be transformed to physical products and valuable services while bringing economic benefits. A business model refers to an operational system, including production, marketing, personnel, research and development and other financial elements to create value.

Nowadays, people have greater desire to stay healthy. Although the production technology and medical technology have been improved dramatically in China, the problem of scarce medical resources still remains unsolved. Moreover, the current system built under scarce medical resources have resulted in mutual hostility between doctors and patients and become more and more unacceptable for patients. When patience resists such a system, the medical practitioners also feel guilty. Therefore, there exist many obstacles and unfortunate events in implementing the system. Many people blame the scarcity of medical resources for the current chaotic situation, as scarcer resources lead to greater competition and intensified hatred among all stakeholders.

The current medical system in China is problematic. For example, the social value of healthcare groups and the notion of covering hospital and medical expenses with revenues from medicines are severely underrated. The medical practitioners are seriously under-paid compared to the amount of work performed. The frequent medical malpractice disputes are also deplorable. Currently, both the medical institutes and patients are wronged significantly. How to change the current situation? There is no easy answer. The academia and industry should collaborate to identify the key success factors for the medical institutes operating in China, and allocate the resources accordingly on these key factors, in order to address the issue of resource scarcity and move the medical industry to a better direction.

Healthcare is a specialty service, including a series of processes such as disease prevention, treatment and rehabilitation. Xu and Zhang [43] proposes to discuss the insights of humanizing medical services from exploring the human nature. One of their insights is that catering to humanity to be also part of medical services. Thus, the medical industry has the following dissimilarities compared to other service industries. (1) The nature of the study of medicine is the study of humanity, and humanity is the core and starting point of medical practice. (2) Humanity need of patients: besides patients, their family members should also be considered as customers. (3) Insights of humanizing medical services: all medical service activities should be based on the needs of patients, including survival, comfort and emotion, in order to satisfy the patients. Medical practitioners should not let the financial aspect as the sole consideration when performing the service. In addition, laws and regulations of the medical industry are also more standardized compared

to other industries. Rehabilitation service also has certain continuity and intensity. The cost of medical services concerning many people cannot be easily evaluated. Therefore, the risks in medical industry exist objectively, and are [4]greater than in other industries [5] & [11]. The parties involved in medical malpractices caused by the risks not only include the patients, it should also include all stakeholders' medical institutes, such as doctors, medical society and government. In short, the medical institute operators should pay close attention to such important issues.

Medical institutes must self-adjust continuously and adapt to the changes in order to survive in the increasingly competitive environment. How to fill the gap among business administration, strategy [13] and medical management, and to enhance the connection between theory and practice (Engaged Scholarship) to improve the applicability of theoretical results in the industry, and finally to identify key success factors of managing medical institutes in order to solve operational problems in the medical field are the purposes of this research.

This study takes the form of an expert questionnaire. To understand the critical success factors of operations, we invite the operators of medical institutes in China as the main subjects of the questionnaire. There were originally 25 questions designed in the questionnaire in the first stage. In this second stage questionnaire, we retain 13 questions from the first stage, and we perform an ISM analysis based on the results. This second questionnaire is answered by 14 deans of public medical institutes and 2 managers in charge of private medical institutes.

In this questionnaire, the original five dimensions were reduced to four as the dimension of information technology was removed. The remaining four dimensions are: the external environment dimension, the business team concept and ability dimensions, the equipment planning product characteristics dimension, and the internal process dimension. This research can effectively help managers understand the interactions between the key factors in the success of medical institutions through further analysis of ISM [11]. It also can be a reference of decision-making in management of medical industry in China.

[4] Risk can be defined as the difference in the results that may occur within a specific time or under specific conditions. Assuming that only one result occurs, the difference is zero and so is the risk. If there may exist multiple results, then there is a risk. The greater difference in the results, the greater the risk. Therefore, the characteristic of risk is the uncertainty caused by the difference. Risk arises when people cannot effectively control the loss caused by uncertainty.

Chapter 1 is an introduction which describes the background of this study. Chapter 2 is the literature review that explores the critical success factors in medical institutes. Chapter 3 shows research methods. Results are described in Chapter 4. Conclusions and recommendations are presented in Chapter 5.

2 Literature Review of the Study on the Success Key Factors of Medical Institutes in China

The business philosophy of medical institutes needs to be changed continuously. Making profit as the business goal may not necessarily be bad. Moreover, the profit directly affects the development of the business. The traditional Chinese thought was to promote agriculture and restrain commerce. Trading activities were generally not encouraged morally, thus were conducted in low profile. Nowadays, Chinese people have experienced a major change in moral values. Conducting business is no longer morally criticized and many people are proud of doing so. However, the same standards can not be applied to the medical industry. The main reason is that traditionally, the medical industry had been entrusted with social welfare obligations by the government. Thus the medical industry has its own special properties and cannot adopt the same profit-making goal as traditional enterprises do. As the proverb states, “success has many fathers.” We should find these "fathers”, which means the key factors, to facilitate the development of medical institutes. To implement its decision, any organization must allocate resources on related activities. Therefore, how to allocate the resources effectively and identify the key success factors are important issues.

2.1 External Environment of Enterprises

One of the key factors that directly affect the development of medical institutes is that government usually formulates healthcare policies in accordance with the current situation. For example, currently, the Chinese government encourages investment of private capital in the medical industry. However, will such policy be continued? Will the future government be concerned about the influence on social welfare and the potential social problems due to the commercialization of the

medical industry and make policy adjustment? These are issues that test the medical institute operator's judgment.

2.1.1 Land (Space) Scalability of Medical Institutes

Many traditional hospitals have problems such as space shortage, chaotic layout and disordered internal traffic flow. Therefore, Zhao and Song [47] point out that reconstruction and expansion of hospitals should focus on modernized functional reorganization layout culture, with the objective of establishing a patient-centered, staff-friendly medical environment. In short, land scalability of medical institutes can assist the growth of business effectively.

2.1.2 Government Strategy (Policy) Support

The inspection of the Chinese medical institutes was founded in 1970, and has evolved to the measures for the administration of the hospital grade over the years. Patients are at disadvantage in the information asymmetry in the medical industry. Currently, the people rely on external information excessively to make their medical decisions. On the contrary, the medical institutes enjoy economic rent. The majority of the patients do not understand their rights. When choosing the medical institute, they tend to have the herding mentality to follow the hospital grade system excessively and blindly. This is the so-called Bandwagon Effect. As a result, hospitals compress patients' time cost and increase the transaction costs of medical treatment. Moreover, in the current hospital grade system, the government does not stipulate the operators of medical institutes to be responsible for evaluating the rights of and creating values for patients. Thus, the Government Strategy (Policy) Supports indeed affect the behaviors of both patients and medical institutes. The seminal work by Arrow [3] points out the following: (1) The particularity of the health care market. The healthcare demand is unstable. Doctors are both patients' representatives and profit-maximizes. The author also emphasizes the uncertainty of medical market output, the uncertainty in people's health status and the entry barriers to suppliers. (2) Under the assumption of certainty, the main differences between the medical market and a perfectly competitive market are increasing returns, entry barriers and price discrimination in medical services. (3) Under the assumption of uncertainty, the author compares

the differences between the medical market and a fully competitive market. He first describes the desirable insurance principle by an expected utility function (under the assumption of risk aversion). Then, he evaluates the influence of moral hazard, third-party payments and adverse selection on the medical insurance market. Finally, he establishes a theoretical model of an optimal insurance policy under risk aversion. It can be interpreted that medical industry is strongly policy-oriented. Therefore, the medical institutes should establish advantages in the system advantages with the government, reduce transaction cost by developing non-market managerial structures among corporations, and allow vertical integration among the enterprises and long-term contracts in order to reduce uncertainty and transaction costs [8]. The contract has more advantages than the market allocation of resources, mainly because it's very effective on quality control and time management.

2.1.3 Medical Institutes and Its Proximity to Major Transportation Facilities

Hospitals need to consider the transportation convenience of patients and assist them to find out the routes and traffic conditions around the hospitals. Shao and Gao [31] point out that the operators need to survey on the road traffic around its location and predict the amount of generated traffic prior to building the hospital. Therefore, introducing the surrounding traffic to patients and assisting them to understand the traffic networks helps increasing the patients' willingness to receive medical treatment.

2.1.4 Government Supervision

Government oversight is one of the drawbacks in the healthcare industry. Zhu [51] points out that in the beginning of the reform and opening-up, there was a severe shortage of investment in the medical industry. Medical institutes were allowed to raise funds through providing services. As a result, the cost of medical services had substantially increased. Later on, allowing hospitals to cover expenses with revenues from pharmaceutical drugs further reduced patients' affordability of medical treatments. This completely deviated from the social objectives of hospitals and cause profit-seeking behaviors.

2.1.5 Competitive Strength of Others in the Industry

Sun [35] finds out that the market competitiveness depends not only on the market structure, but also on how fast the price information disseminates among consumers. Since the spread of prices of medical services is gradual and slow, the level of competition in the medical service market is much lower than the other service industries.

2.2 Philosophy and Capability of Operating Team

Economic theory assumes that individuals are rational, always make logical decisions in their self-interest, and motivated by external matters. These three well-known assumptions can also be applied to the operations of medical institutes. Medical institutes must have a certain degree of selfishness and seek profit to promote the progress of medical services. The ingenious business strategy from the operators is for improving operating efficiency, reducing costs and increasing profits. Staff in the institutes would respond to incentives in order to obtain higher returns. By observing the management of hospitals through these concepts, we can understand that the operational goal of medical institutes is generally the same as the goal of a general business enterprise: both are to maximize profits.

2.2.1 Operators' Innovation

Li, Lu, Deng and Zhu [18] indicate that Chinese medical institutes are facing managerial difficulties. It is very common that hospital cultural construction is separated from the actual development. Many hospitals have good technical skills, but with old management concept, they just simply follow the traditional culture without any improvement and innovation. As a result, hospital development is constrained. In addition, Zhang [45] believes that hospital management innovation refers to a people-centered and a more effective healthcare resource integration model. It effectively integrates human resources, marketing services management, medical technology management and business policies. Abrami, Kirby and McFarlan [1] also point out that the leaders should by trained through humanistic education. Chinese people have accepted the beliefs of many American universities that the best leaders have the most extensive humanistic education. The target of humanistic education is not training experts of special industry, but

holistic education which cultivates people with curiosity, thinking and skepticism. Therefore, Strategic Planning and Overall Positioning of the medical institutes are closely related to the philosophy and especially the innovative thinking of the decision-makers of hospitals. The creativity of the operators is crucial and necessary for the management of hospitals.

2.2.2 Strategic Planning and Overall Positioning

Porter and Lee [28] propose that it is time for the medical industry to launch a new strategy. The new strategy must seek the maximum value for patients, in other words, to achieve the best results using the lowest cost. The medical institutes should set value creation as the primary objective. Shen [32] points out those hospitals would become independent decision-makers that should be responsible for their own profits and losses. The marketing will determine the future of hospitals. Therefore, hospitals need to change their management thinking and improve competitiveness for survival and development.

It thus indicates the importance of Strategic Planning and Overall Positioning for medical institutes. The healthcare industry has gradually transformed to be value-oriented. Facing the immense pressure of Cost Control, the payers of medical care are actively promoting the reduction of medical cost. In the future, medical institutes may give up fee-for-service and switch to a performance-based reimbursement policy.

2.2.3 Business Purpose, Philosophy and Management Objectives

It has been a long time since the hospitals have been defined as public institutions. Therefore, the role of management has been weakened from theory to practice. Moreover, many operators have a medical background and are not familiar with the philosophy of management. As a result, the importance of hospital management has been largely discounted; the operators still run hospitals by the medical management philosophies under the planned economy.

Therefore, the Business Purpose, Philosophy and Management Objectives are all important factors. Wei and Huang [42] point out that business is an administrative science that includes investment, financing and marketing, and should be a very important concept in hospital management. Lu and Zhao [22] point out that at the

current stage; it is impractical and impossible to run the Chinese medical institutes by just blindly coping the managerial experiences of running hospitals from Europe and America and employing management professionals with non-medical backgrounds. On the other hand, appointing operators who are medical experts but lack managerial skills is also problematic. This issue is especially serious in every level of public hospitals. Thus, the operators of medical institutes must possess investment funds, knowledge management, operational philosophy of human resources and marketing concepts to adapt to the societal changes.

2.2.4 Cross-Industry Combination and Increasing Non-Medical Business Project

Hospital operators should fully understand the value of intangible assets and leverage to produce business results. Liu [20] points out that hospital should take full advantage of their reputation, location, brand name and technology to find out their unique management methods and monopolize and expand the service selling and market service perimeter, in order to achieve greater social and economic benefits.

2.2.5 Capacity of Sales Channels

The selection of target market is crucial. Hospitals should first satisfy the actual or potential needs of the patients, and then develop specific markets. Wang [38] points out that the main marketing strategies of entering the target market include: (1) undifferentiated market strategy – setting the entire market as the target; (2) differentiated market strategy – classifying the markets according to the characteristics of patients with different needs; and (3) concentrated target market strategy – choosing its own target market and centralize and integrate all human, financial and material resources to service the market.

2.2.6 Advertising Propaganda Power

Hospital advertising and marketing must stand in the shoes of patients. Zheng [50] shows that many hospitals enter the market blindly without considering the principle of market segmentation. And their advertisements are homogenized. Thus, hospitals should pay more attention to diversifying the selection of

advertising media and promotional means.

2.3 Application of Information Technology

Application of information technology can effectively increase the work efficiency. It is the inescapable responsibility of medical institute operators to persuade their staff and organization to accept and adapt to the new information.

2.3.1 Information Technology Innovation (If Emerge New Technologies)

Prasad [29] studies the introduction of information system in an American hospital. He finds that the doctors have a romantic understanding of the system: the system can implement medical tasks without any disgruntle, no-shows and therefore is a faithful servant. The nurses have a practical view. They think that the system is a competent helper that can reduce their workloads as well as promote the professional nursing image. Both the doctors and nurses are happy about the introduction of the system. Therefore, the introduction of information systems can help healthcare practitioners improve their work efficiency.

2.3.2 Construction of Information Technology (Introduction of New Technologies)

Yang and Zhou [44] point out that information itself is one of the main resources of the hospitals. Hospitals can use information to serve management through efforts to deploy information technology. The executions of managerial functions such as the planning, organization, commanding, coordination and control of the hospital all depend on the information of the hospital. It would difficult to improve the managerial standard without comprehensive utilization of all aspects information of the hospitals.

2.3.3 Feedback of Medical Market Information in the Future

According to Zhao, Huang, Liu and Dong [48], establishing the feedback of future medical market information can facilitate operators with their analysis and judgment and help organizations with sustainable development. The authors propose to combine all closed-form information service providers systematically into a single entity that provides open-form services, by integrating the resources

to form a giant but invisible database with the help of computer networks.

2.3.4 Establishment of Customers' or Patients' Response System

Chen [6] refers to Customer Relationship Management in hospitals as a marketing process that uses information technology to acquire, maintain and increase profitable clientele (patients). This means that hospitals must integrate all resources more efficiently and satisfy clients with lower cost. Han, Bai, Fang and Wang [12] point out that patients are the only income sources within the hospital value chain from the perspective of the value chain and process management. Therefore, hospitals should be patient-centered when developing medical services, and use client satisfaction as the criteria to assess the quality of work. It is well known that the medical industry requires high levels of professionalism and social openness. High level of professionalism refers to the fact that relevant practitioners must gain maturity by long-term practical experiences, after going through highly intensive professional training for a long period. High level of social openness means that all members in the society can access medical services at any time. In contrast to the general population, medical practitioners are highly professional. This results in certain degree of doctor-patients conflict. Therefore, establishing a customer or patient feedback system is a key success factor for medical institutes.

2.4 Equipment Planning and Product Features

It is necessary to have effective tools to do good work. The ongoing technological innovation provides higher values for patients. However, how to avoid diversification of medical services due to innovation and enhance the value of the institutes are worth to investigate.

2.4.1 Comprehensiveness of Related Medical Equipment's

Wang [39] points out that medical equipment and other fixed assets of hospitals has not only become an important indicator of hospital, but also provide important guarantees of providing medical services. The management of fixed assets and utilization of equipment directly affects every aspect of economic management. Moreover, Ge, Qian, Lu, Wang and Deng [10] point out the importance of medical

equipment in the sense that adding modern equipment would improve the service quality of hospitals and help satisfy the medical needs of a large number of patients. Porter and Telsberg [27] mention that value-based competition is healthy competition in the medical revolution. Both competent companies and consumers can benefit with an increase in the service value. Therefore, a company that provides excellent value with its unique method will become the winner and naturally attract more business. The unique method is one of the key success factors to be found in this study.

2.4.2 Introduction of New Medical Technology and Pharmaceuticals

Medical institutes require the introduction of new medical technology and drugs. Wan [40] points out that new medical equipment and technology cover various fields with corresponding professional knowledge. The utilization of medical equipment is a process of comprehensive contact with human. During development, hospitals not only need to treat patients, but also need to improve the treatment quality and medical standards. Edmondson, Bohmer and Pisano [9] find out how a surgical team experiences a collective learning process during the introduction of cardiac catheterization procedure. The process includes new surgical practices, new communication behavior and team reflection. To subvert the old organization regulation and introduce innovative practices, it is important to subvert the old organization routine and introduces innovative practice.

As a result, when medical institutes are confronted with the booming environment of medical equipment's and technology, operators should keep strengthening the capacity of medical institutes to meet the needs of society today.

2.4.3 Stability of Patients' Sources

The first step of Sustainable management of medical institutes is to ensure the improvement in the stability of patient source. Li, Tong and Wu [19] point out that the image of hospitals is reflected by various elements, including intangible image such as spirit, managerial policies, standard style, service quality and reputation. It also includes tangible image. Hospital should combine these various advantages effectively to play a role. Merlino and Raman [15] point out that medical institute had not been required to provide high-quality customer service in order to

compete for a long time. However, the hospitals suddenly find out that they must do so now. Under such circumstances, medical institutes usually face challenges difficult for organization culture, staff and the existing processes to adapt to. Thus, to improve the situation, the hospitals need to implement a series of measures, such as setting chief experience officer or Office of Patient, to strengthen the stability of patient source and improve an image. This is because image and reputation directly impact on the willingness of patients to receive medical treatment.

2.5 Internal Processes

Medical industry should not only consider the pressure from economic operation, but also deal with the greater expectations from society and pressure from government. After all, it is much harder to calculate the monetary value of life and health than other products.

Therefore, medical industry should emphasize in particular the organizational system, specialization and legitimacy.

2.5.1 The Ability of Medical Activities Planning Process

During the period of process re-engineering, most companies would face many issues and even more failures. Some companies develop slowly, or stop. Only a small fraction of companies would succeed with excessive cost. Therefore, medical institutes should emphasize the capability of planning medical activities and processes. Hammer [24] believes that organizations must ensure that their business processes become more "mature". In other words, organizations must be able to improve performances continuously. Zhao [49] suggests that the re-engineering process for hospitals should consist of systematic concepts and insights of process re-engineering, system framework, implementation procedures, application status and social significance. Hospitals should understand the application method of process engineering from a managerial perspective. Process re-engineering improves the organizational culture and optimizes organizational efficiency. Therefore, operators must pay attention to the processing enabler including design, executors, basic infrastructure, standards, and enterprise capability that applies to the leadership of the entire organization.

2.5.2 Internal Supervision of Medical Institutes

In hospital management, no matter how strict the management, control and sanctions are, the hospital can only manage the surface and has no control over the gray income and opportunities. Therefore medical institutes should pay attention to internal supervision effort. Song, Yu and Chen [36] note that there appear to be many imperfections in financial supervision and management in the current Chinese public hospitals, resulting in ineffectiveness in hospital financial regulation. As a result, financial risks exist and disciplinary problems occur frequently.

Peng, Zheng, Xu and Yao [26] suggest that dealing with commercial bribery is a systematic project. The measures to solve these problems include (1) strengthening the purifying effect of education and moral restriction so that people do not want to violate disciplines; (2) straightening the profit-value and quality-price relationships of medical drugs and products as well as profit allocation and compensation mechanisms so that people do not need to violate disciplines; (3) improving and strengthening the legal system so that people dare not to violate disciplines; and (4) improving the supervision management mechanisms to prevent rent so that people cannot violate disciplines.

Therefore, establishing a perfect internal supervision system within the hospital not only allows the monitoring of all levels of hospitals, but also allows the supervision of high-level management. It facilitates sustainable development of medical institutes.

2.5.3 Medical Institutes Financial Ability (Financial Status)

The most difficult problem for medical institutes is funding. According to Pan [25], operating deficit of hospitals refers to the financial losses arising from the inability of hospitals to compensate for various cost consumption and to break even with government financial investment and income from medical service and net prices of drugs. Zhang [46] points out that the significance of strengthening financial analysis. The main purpose of financial analysis is to analyze and evaluate the past and financial situation, operating outcome, and cash flow of hospitals

Therefore, operators can improve the efficiency of operation and management by understanding the management deficiency in the past by financial analysis.

Operators must change the traditional concepts of management and give high priority to financial analysis and decision-making. Operators can understand the true situation and make the right decision by financial analysis, thereby improving the competitiveness of the medical institutes.

2.5.4 Economies of Scale of Medical Industry

Sun, Sun and Guo [34] show that the scale and the economy didn't have a direct correspondence，the factors which influents economy are structured, this survey also shows most of the hospital didn't show economies of scale, but there are 25% of hospitals had economies of scale. Although the theory of economic surplus dominates Chinese public hospitals and hospitals can expand rapidly, economies of scale are not the decisive factor.

2.5.5 Cost Control

Kaplan & Porter [16] find that the major reason for the rapid rise of medical is that the healthcare providers have little understanding of the cost of healthcare. They lack the necessary knowledge to improve the utilization of resources, reduce delays and eliminate non-performance-improving activities. This research recommends measuring operating cost using the trial method in the European and American medical system. The method measures the full cost of complete treatment of patients with certain diseases, and compare cost and effectiveness. When healthcare providers and patients understand the cost better, medical institutes can allocate resources and control cost more effectively.

2.5.6 Personnel Cultivation Plan, Education and Training and Incentives

Tang [37] proposes that human resources are the primary priority of all resources, including medical institutes. Human resources are a symbol of cohesion. Hospital management should increase the degree of freedom, and hospital operators should also put emphasis on personnel experience at work. Chen, Tian, Wu and Wu [7] believe that hospitals must confirm their position first and break away from the traditional management methods to manage human resources.

Thus, business strategies of medical institutes and development of human resources influence each other. China is facing the open-up of medical market,

hospital restructuring and even the trend of hospital privatization. In the future, China will face the challenges from connecting with international practices. Medical organizations need excellent personnel and culture in order to achieve superior performance. In other words, the relevance between personnel and culture excellence and success is the greatest.

2.5.7 The Impact of Medical Experts and Famous Doctors on Business Operation

In the study of prevention of gravity caused death and major trauma in parachutes, Smith and Pell [33] point out that placebo effect can also be the result of medicalization. Thus, medical institutes can employ expert and noted doctors to improve the patients' perception about the treatment. Li [21] points out that the medical service market is a competitive market. The competition provides driving force. Noted doctors and specialists should follow the market trend to satisfy the medical service markets, value the role of medical institutes in the competition, use personnel effectively to promote the overall level of famous doctors and brand specialists.

3 Aspects of Expert Questionnaires Selection and Influence Factors

3.1 Expert Questionnaires Design and Aspects

This research mainly focuses on the key success factors for operating medical institutes. The main goal of the research is to understand how to lead medical institutes to success through strategic management and to construct a new management policy framework of enhancing key success factors. In order to better understand the operating situations of medical institutes, we discuss the fundamentals based on literature; combine the researches on key success factors for medical institutes in China, conduct questionnaire interviews with related professionals to identify the need for relevant factors. Table 3-1 below aggregates the facets of the literature in this study.

Table 3-1: Questionnaires items of this research

Main facets	Minor facets	Relevant literature
External environment of enterprises	Land (Space) Scalability of Medical Institutes	(Zhao and Song, 2006)
	Government Strategy (Policy) Support	Arrow(1963) Coase(1937)
	Medical Institutes and Its Proximity to Major Transportation Facilities	(Shao and Gao, 2010)
	Government Supervision	(Zhu, 2007)
	Competitive Strength of Others in the Industry	(Sun, 2008)
Philosophy and capability of operating team	Operators' Innovation	Zhang (2005) Li, Lu, Deng and Zhu (2006) Abrami, Kirby and McFarlan (2014)
	Strategic Planning and Overall Positioning	Porter and Lee(2013) Shen (2006)
	Business Purpose, Philosophy and Management Objectives	Wei and Huang (2006) Lu and Zhao (2008)
	Cross-Industry Combination and Increasing Non-Medical Business Project	Liu (2005)
	Capacity of Sales Channels	Wang (2008)
	Advertising Propaganda Power	Zheng (2009)
Application of information technology	Information Technology Innovation (If Emerge New Technologies)	Prasad（1993）
	Construction of Information Technology (Introduction of New Technologies)	Yang and Zhou (2005)
	Feedback of Medical Market	Zhao, Huang, Liu and Dong(2011)

	Information in the Future	
	Establishment of Customers' or Patients' Response System	Han, Bai, Fang and Wang (2012) Chen (2006)
Equipment planning and product features	Comprehensiveness of Related Medical Equipments	Wang (2008) Ge, Qian, Lu, Wang and Deng (2006) Porter & Telsberg, (2006)
	The Introduction of New Medical Technology and Pharmaceuticals	Wan (2008) Edmondson,Bohmer & Pisano（2001）
	Stability of Patients' Sources	Merlino and Raman(2013) Li, Tong and Wu (2004)
Internal processes	The Ability of Medical Activities Planning Process	Hammer(2007) Zhao (2006)
	Internal Supervision of Medical Institutes	Song, Yu and Chen (2010) Peng, Zheng, Xu and Yao (2010)
	Medical Institutes Financial Ability (Financial Status)	Zhang (2011) Pan (2004)
	Economies of Scale of Medical Industry	Sun, Sun and Guo (2009)
	Cost Control	Kaplan & Porter (2011)
	Personnel Cultivation Plan, Education and Training and Incentives	Chen, Tian, Wu and Wu (2008) Tang (2007)
	The Impact of Medical Experts and Famous Doctors on Business Operation	Smith and Pell (2003) Li (2011)

3.2 Relevant Experts of Completing Questionnaires

The questionnaire surveys senior operators of public and private medical institutes in order to enhance the objectivity of selecting factors from the questionnaire. The purpose of making questionnaires focusing on senior management personnel is to

understand decision makers' opinions on critical success factors of medical institutes. Table 3-2 shows relevant information of experts completing the questionnaires.

Table 3-2: Qualification of experts completing questionnaires

Objects	Public hospitals	Private hospitals
Quantity	13	3
Job title	Directors* 13	Chairman of board *1 General manager* 1 Director *1
Work experience	30 years and above*4 21-30 yeas* 9	30 years and above*1 16-20 years*1 6-10 year*1
Gender	Male *9 Female *4	Male *2 Female*1
Age	51-60 years old*9 41-50 years old*4	51-60 years old*2 31-40 years old*1
Education level	Master degree*1 Bachelor degree*12	Bachelor degree *3
Scale of medical institutes	301 people and above *5 201-300 people* 1 51-100 people*3 50 people and below*4	201-300 people *1 51-100 people *2

3.3 The Judgment Criterion

After the recovery of expert questionnaires, in order to understand the expert judgment of various factors, research variables are used for observation and measurement. The empirical results of this study are divided into two parts. The first part is the content validity ratio (CVR) by Lawshe [17] and the second part is interpretive structural modeling (ISM).

The content validity ratio (CVR) is one of the important factors to judge criterion. Its formula is shown in Figure 3-1. The judgment criterion is shown in Table 3-3. The number of experts is 16 in this research. Therefore, the judgment criterion

has a CVR value of 0.49.

$$CVR = (n_e - N/2)/(N/2) \quad \text{(Model 3-1)}$$

N：total number of Subject matter Experts (SME) experts

n：Number of SME experts indicating “essential”

Table 3-1：Lawshe (1975)Minimum Value of CVR

Minimum Value of CVR and One Tailed Teat, p = .05	
No. of Panelists	Min . Value*
5	.99
6	.99
7	.99
8	.75
9	.78
10	.62
11	.59
12	.56
13	.54
14	.51
15	.49
20	.42
25	.37
30	.33
35	.31
40	.29

4 Analysis and Discussion of Results

4.1 External Environment of Enterprises

Table 4-1: External environment of enterprises.

Factors	**n**	**CVR**	**Screening results**
Land (Space) Scalability of Medical Institutes	**6**	**-0.25**	**X**
Government Strategy (Policy) Support	**14**	**0.75**	**O**
Medical Institutes and Its Proximity to Major Transportation Facilities	**11**	**0.375**	**X**
Government Supervision	**8**	**0**	**X**
Competitive Strength of Others in the Industry	**3**	**-0.625**	**X**

With increasing health care costs and health risks, operations of medical institutes are facing a challenging test. If medical institutes cannot change the external environment, they can only adapt to the environment by self-adjustment. Therefore, only one important factor, Government Strategy (Policy) Support, remains in the facets of Enterprise external environment.

4.2 Philosophy and Capability of Operating Team

Table 4-2: Philosophy and capability of operating team.

Factors	**n**	**CVR**	**Selecting results**
Operators' Innovation	**15**	**0.87**	**O**
Strategic Planning and Overall Positioning	**15**	**0.87**	**O**
Business Purpose, Philosophy and Management Objectives	**16**	**1**	**O**
Cross-Industry Combination and Increasing Non-Medical Business Project	**0**	**0**	**X**
Capacity of Sales Channels	**6**	**-0.25**	**X**
Advertising Propaganda Power	**6**	**-0.25**	**X**

Members of organizations have resistance when they face reform. Only a few

organizations can introduce new competitive strategies successfully. Thus, a strategy-oriented model should first test the communication between responders and defenders, and then get support from the forward-looking leaders to perform strategic promotion. To improve competitiveness and create sustainable operations in the medical market, this study recommends that decision-makers of medical institutes to adopt gradual adjustment of policy, and review and evaluate the awareness of business strategy of employees regularly. [4]

Therefore, Philosophy and Capability of Operating Team only keeps three important factors, including Operators' Innovation, Strategic Planning and Overall Positioning, and Business Purpose, Philosophy and Management Objectives.

Therefore, there are only three important factors in the Philosophy and Capability of Operating Team aspect: Operators' Innovation, Strategic Planning and Overall Positioning, and Business Purpose, Philosophy and Management Objectives.

4.3 Application of Information Technology

Table 4-3: Application of information technology.

Factors	**n**	**CVR**	**Screening results**
Information Technology Innovation (If Emerge New Technologies)	**8**	**0**	**X**
Construction of Information Technology (Introduction of New Technologies)	**9**	**0.125**	**X**
Feedback of Medical Market Information in the Future	**8**	**0**	**X**
Establishment of Customers' or Patients' Response System	**12**	**0.5**	**O**

Development of information technology significantly improves the overall productivity of society. To facilitate sustainable development, the medical industry will inevitably use information technology to improve the efficiency of medical care, reduce the incidence of medical errors and accidents and improve service quality effectively. Medical institutes must maintain good relations with customers,

meet the diverse needs of customers, improve customer satisfaction and reduce the frequency of complainant to achieve the business vision. Since most people do not have health-related knowledge, and their subjective sense of personal satisfaction is very strong, we hope to further understand and improve the communication process between medical institutes and patients in this study.

Therefore, there is one important factor, the Establishment of Customers' or Patients' Response System in the Application of Information Technology aspect.

4.4 Equipment Planning and Product Features

Table 4-4: Equipment planning and product features.

Factors	**n**	**CVR**	**Screening results**
Comprehensiveness of Related Medical Equipments	**15**	**0.87**	**O**
Introduction of new medical technology and pharmaceuticals	**15**	**0.87**	**O**
Stability of Patients' Sources	**14**	**0.75**	**O**

The ongoing innovation of medical technology, effective management of medical resources, human resources and the planning of medical services and products closely influence the quality of service provided by medical institutes. Design and planning of medical institutes should fully consider various specialists and facilitate medical treatment of patients and operation of stuff. This is one of the key factors to ensure the effective operation of medical institutes.

Therefore, Equipment planning and product features facet keep all three important factors, including Comprehensiveness of Related Medical Equipment's, introduction of new medical technology and pharmaceuticals and Stability of Patients' Sources.

4.5 Internal Processes

Table 4-5: Internal processes.

Factors	**n**	**CVR**	**Screening results**
The Ability of Medical Activities Planning Process	**14**	**0.75**	**O**
Internal Supervision of Medical Institutes	**16**	**1**	**O**
Medical Institutes Financial Ability (Financial Status)	**12**	**0.5**	**O**
Economies of Scale of Medical Industry	**8**	**0**	**X**
Cost Control	**10**	**0.25**	**X**
Personnel Cultivation Plan, Education and Training and Incentives	**14**	**0.75**	**O**
The Impact of Medical Experts and Famous Doctors on Business Operation	**16**	**1**	**O**

To maintain efficient operation, the internal process needs to achieve greater excellence. Operations must face the issues of promoting the improvement of internal processes, building efficient management and coordinating the corresponding evaluation, tracking and feedback mechanism.

Medical institutes should maintain the driving force of improvement the ability to respond to market changes, strengthen the professional quality of operators so as to enhance the overall image of healthcare professionals and the capabilities of administration and operations management.

Therefore, Internal processes facet keeps five import factors, including The Ability of Medical Activities Planning Process, Internal Supervision of Medical Institutes, Medical Institutes Financial Ability (Financial Status) and The Impact of Medical Experts and Famous Doctors on Business Operation.

4.6 ISM Methodology and Model Development

ISM is a qualitative and interpretive method which generates solutions for complex problems through discourses based on the structural mapping of complex interconnections of elements [23] [41]. This method shows that the group's judgment decides whether and how the elements are connected. [2] Therefore, the

construction of ISM is divided into 5 major steps: SSIM, reachability matrix, the level of criterion, conical form of reachability matrix, and the final ISM model.

4.7 Structural Self-interaction Matrix (SSIM)

To analyze the contextual relationship between elements and indicate how this relationship "lead to" is chosen, Structural Self-Interaction Matrix (SSIM) (Table 4-6) has been developed. In order to get more accurate results, this SSIM is sent to 16 experts, and based on their responses; the SSIM has been modified as shown in Table4-6.

Table 4-6: Structural Self-interaction Matrix.

Structural Self-interaction Matrix													
	13	12	11	10	9	8	7	6	5	4	3	2	1
1. Government strategy (policy) support	O	O	V	O	O	X	O	O	V	X	A	O	
2.Establishment of customers' or patients' response system.	O	O	O	O	O	X	O	O	V	V	O		
3. Operators' innovation.	A	X	O	O	O	O	X	O	X	O			
4. Strategic planning and overall positioning.	A	X	A	O	X	X	O	X	X				
5. Business purpose, philosophy and management objectives.	O	X	O	X	X	O	O	O					
6.Comprehensiveness of related medical equipment.	O	O	X	O	O	X	A						
7. Introduction of new medical technology and pharmaceuticals.	A	O	X	O	O	X							
8. Stability of patients' sources.	X	O	O	X	A								
9. The ability of medical activities planning process.	O	O	O	O									
10. Internal supervision of medical institutions and business purpose.	O	O	O										
11. Medical institutions financial ability. (Financial status)	O	O											
12.Personnel cultivation plan, education and training and incentives.	O												
13.The impact of medical experts and famous doctors on business.													

To clearly present the existence of the relationship between any two sub-elements (i, j), four symbols are used to show the direction of the relationship between the *i* and *j*:

V – if i relates to j but not vice versa;

A – if j relates to I but not vice versa;
X – if i and j relates to each other; and
O – if i and j are not related.

4.8 Reachability Matrix

The SSIM has been converted into a binary matrix, which is called the reachability matrix. The entry V, A, X and O of the SSIM are converted into 1 and 0. Then the transitivity needs to be checked. If element i is related to element j, and j is related to element i, then we can conclude that element i is related to element j. This is the main assumption in ISM that leads to the final reachability matrix (Table 4-2) by the following rules:

- If the (i, j) entry in the SSIM is V, then the (i, j) entry in the reachability matrix becomes 1 and the (j, i) entry becomes 0.
- If the (i, j) entry in the SSIM is A, then the (i, j) entry in the reachability matrix becomes 0 and the (j, i) entry becomes 1.
- If the (i, j) entry in the SSIM is X, then both the (i, j) and (j, i) entries in the reachability matrix become 1.
- If the (i, j) entry in the SSIM is O, then both the (i, j) and (j, i) entries in the reachability matrix become 0.

Table 4-7: Final Reachability Matrix with Driving and Dependence Power.

Final reachability matrix with driving and dependence power														
Elements	1	2	3	4	5	6	7	8	9	10	11	12	13	Driving Power
1	1	0	0	1	1	0	0	1	0	0	1	0	0	5
2	0	1	0	1	1	0	0	1	0	0	0	0	0	4
3	1	0	1	0	1	0	1	0	0	0	0	1	0	5
4	1	0	0	1	1	1	0	1	1	0	0	1	0	7
5	0	0	1	1	1	0	0	0	1	1	0	1	0	6
6	0	0	0	1	0	1	0	1	0	0	1	0	0	4
7	0	0	1	0	0	1	1	1	0	0	1	0	0	5
8	1	1	0	1	0	1	1	1	0	1	0	0	1	8
9	0	0	0	1	1	0	0	1	1	0	0	0	0	4
10	0	0	0	0	1	0	0	1	0	1	0	0	0	3
11	0	0	0	1	0	1	1	0	0	0	1	0	0	4
12	0	0	1	1	1	0	0	0	0	0	0	1	0	4
13	0	0	1	1	0	0	1	1	0	0	0	0	1	5
Dependence	4	2	5	10	8	5	5	9	3	3	4	4	2	

4.9 Level Partition

From the reachability matrix, the reachability set and the antecedent set for each element are found. The reachability set consists of the element itself and other elements to which it may reach, whereas the antecedent set consists of the element itself and the other elements which may reach to it. Table 4-8 shows the results [2].

Table 4-8: Levels of Criterion.

Element	Reachability set	Antecedent set	Intersection set	Level
1	1,4,5,8,11	1,3,4,8	1,4,8	II
2	2,4,5,8	2,8	2,8	II
3	1,3,5,7,12	3,7,12,13	3,7,12	III
4	1,4,5,6,8,9,12	1,2,4,5,6,8,9,11,12,13	1,4,5,6,8,9,12	II
5	3,4,5,9,10,12	1,2,3,4,5,9,10,12	3,4,5,9,10,12	I
6	4,6,8,11	4,6,7,8,11	4,6,8,11	II
7	3,6,7,8,11	3,7,8,11,13	3,7,8,11	II
8	1,2,4,6,7,8,10,13	1,2,4,6,7,8,9,10,13	1,2,4,6,7,8,10,13	II
9	4,5,8,9	4,5,9	4,5,9	II
10	5,8,10	5,8,10	5,8,10	II
11	4,6,7,11	1,6,7,11	6,7,11	I
12	3,4,5,12	3,4,5,12	3,4,5,12	II
13	3,4,7,8,13	8,13	8,13	III

4.10 Formation of ISM

From the reachability matrix (Table 4-2), the structural model is generated by means of vertices (or nodes) and lines of edges. If there is a relationship between element i and j, then an arrow which points from i to j is shown. The resulting graph is called a directed graph or digraph and the element descriptions are called ISM. (Figure 4-1)

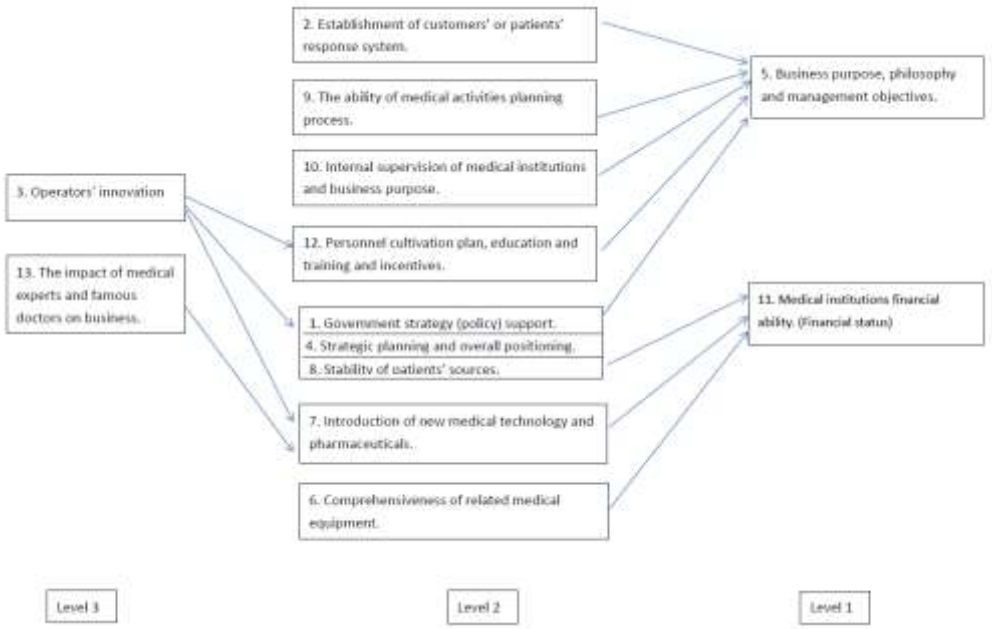

Figure 4-1: Interpretive Structure Modeling (ISM) for Success Key Factors of Medical Institutes in China

Figure 4-1 shows the interpretive structural model of the success key factors of medical institutes in China. From this model, the key factors of heath care institutes are affected by one another, so this study will avoid focusing on any single dimension but consider the interactive relationship. Therefore, there are three levels of relationship in the procedure of medical institutes operation. The business purpose, philosophy and management objective is significantly influenced by four main key factors (internal supervision of medical institutions and business purpose; operators' innovation; the ability of medical activities planning process and internal supervision of medical institutions and business purpose). Meantime, business purpose, philosophy and management objectives and strategic planning and overall positioning affect each other as well. The factor of operators' innovation is affected by personnel cultivation plan, education and training and incentives, government strategy (policy) support, strategic planning and overall positioning, stability of patients' sources and introduction of new medical technology and pharmaceuticals.

The impact of medical experts and famous doctors on businesses is affected by

introduction of new medical technology and pharmaceuticals. Government strategy (policy) support, personnel cultivation plan, education and training and incentives, internal supervision of medical institutions and business purpose, the ability of medical activities planning process and establishment of customers' or patients' response system are affected by business purpose, philosophy and management objectives. Stability of patients' sources, Introduction of new medical technology and pharmaceuticals and comprehensiveness of related medical equipment are affected by medical institutions financial ability (financial status).

Regarding to the descriptions of the above hierarchical relationship, it shows that medical institutes financial ability (financial status) and philosophy and management objectives are the highest goal criteria. Therefore, the structural chain rules of this study all influence one another.

5 Conclusion and Suggestion

Due to the changes of the medical market environment in China, the past at-all-cost operations and the national safeguard system could no longer keep up with the existing market. Following medical industrialization, medical institutes have naturally transformed to enterprises after they were required to self-finance. Medical institutes would encounter operating problems especially when they lose or receive less government subsidy and the medical practitioners have reduced income. As a result, medical institutes must try to increase their revenues by all means to stay in the market.

Therefore, this study found that the medical staff will implement the medical work at-all-cost (Clinicians is Hippocratic Model), but in the same circumstances, the operators of medical institutes not only consider to saving patients but also have to think its cost and future development of medical institutes (Hospital CEO is Business Model). As well, the government needs to measure the fairness of social development and the allocation of overall medical resources under the innovation and expansion of clinical experts and hospital operators (Health Administrator is Social Service Model). When the correlation between key factors is found, it is also important to understand the importance of various key success factors and to

derive the right strategic decisions. We hope that these strategic decisions we highlighted can provide substantial benefits to the medical institutes in China.

5.1. Conclusion and Suggestion

After summarizing the conclusions of analysis expert questionnaire in this study, we find the following relevance among key success factors of the medical institutes:

1. With regard to the Enterprise External Environment aspect, the experts believe that the "Government Strategic (Policy) Support" factor is significant. This result supports Arrow [3] in the sense that the demand of the medical market is unstable and has certain special properties due to the uncertainties in people's health status and the entry barrier to the medical service suppliers. The government policies directly affect Business purpose, philosophy and managerial objective. Therefore, medical institutes in China must meet the government policy.
2. Operators' innovation could be an effect of other key factors such as personnel cultivation plan, education and training and incentives, and it also has a significant correlation with business purpose, philosophy and manage objective. So it shows that operator's innovation is most important among all key factors.
3. The impact of medical experts and famous doctors on business affect the factor of the introduction of new medical technology and pharmaceuticals and then the factor of medical institutes' financial ability. (Financial status), therefore, it proves that hiring experts and the introduction of new medical methods can significantly improve the medical institutes' income. In this study, it must also be recognized that the financial situation is absolutely the most important factor identified by the experts.
4. The only significant factor is "Establishment of Customers' or Patients' Response System." The study found that that the experts value the feedback from patients seriously. These results show that the medical institutes should integrate their resources to communicate with the patients effectively.
5. All factors in the "Equipment Planning and Product Features" are significant, indicating that the experts attach considerable importance to the introduction

of medical equipment and technologies. The experts may believe that hospitals will be under greater pressure due to possible issues, such as to reduce cost, improve service quality and serve more patients.

6. The experts place considerable importance on the medical institutes' capacity of internal integration, including concerning and relevant factors such as organizational abilities, internal supervision, personnel training and financial management.

Besides consulting internal employees and advisors about business strategies, the operators should also seek the opinions of external independent consultants. Medical institutes should establish a systematic model of business strategy.

5.2. Coverage Initiated and limitations

The healthcare industry, after all, should be people-oriented. Since people have always been the largest variable in research, changes at any single moment could lead to elusive consequences and cause a gap between research objectives and the results. However, such a gap drives researchers to diligence and perfection. Research must be objective, follow rationality and evidence and avoid subjective bias. Science is no panacea due to its limitation, but fortunately it is always moving forward. Moreover, science may not be 100% correct as it is subjected to errors and relativity. However, we can keep science advancing as long as correct the errors and perform optimization. The current status of medical market is the result of the long time accumulation of habitual practices. The many seemingly unreasonable matters are the result of people's natural selection. This study does not serve as the ideal cure to the current problems. We only expect to solve many small scale problems for the medical institutes. During our interviews, we could not avoid the bias of the experts due to their past experiences or personal opinions; neither could we control their personal preferences. The medical industry has a multi-level structural across government, organizations, patients and their families. It is the standard limitation of research that a researcher has no control over government policy factors.

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