



An Investigating on Innovativeness to Improve Business Management of Medical Industry in Henan Province, China

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Abstract

Background and Aim: The global medical industry is experiencing growth due to economic development, emerging markets, and improved living standards. This paper aims to explore the perception level of innovativeness from the employee perspective of the medical industry in Henan Province, China, and to study the guidelines of innovativeness to improve business management in the medical industry in Henan Province, China.

Materials and Methods: The quantitative research method was used in the research methodology. The 360 employees in the medical industry of Henan province are the key respondent of this research. The questionnaire is the research instrument. Statistical values such as mean and standard deviation were used for data analysis to define the information that was presented in the research result.

Results: The study analyzes employee perceptions of innovativeness in the medical industry in Henan Province, focusing on product, market, process, behavioral, and strategic variables. Results reveal high levels of innovativeness in product, market, process, and behavioral areas, highlighting the importance of strategic innovation in resource utilization.

Conclusion: The study examines employee perceptions of innovativeness in Henan Province's medical industry, revealing high levels in product, market, process, and behavioral areas. Research emphasizes the significance of innovation management in promoting creativity, sustained progress, and network relationships. Successful organizations utilize innovative approaches, explore new markets, and focus on customer service and personnel development for a competitive edge.

Keywords: Innovativeness; Business Management; Medical Industry

Introduction

The global medical industry is experiencing growth due to economic development, particularly in emerging markets, and improved living standards (Kamkankaew et al., 2023). The number of medical industry enterprises in Henan Province has increased from 597 in 2020 to 796 in 2021 (The Government of Henan Province, 2022), with revenue from principal business reaching 293.1 billion yuan in 2021 (The Government of Henan Province, 2022). The government has issued over 1700 pharmaceutical policies to push forward supply-side reforms, influenced by the industry's development and competitiveness (Zuo et al., 2022). Talents are vital to the development of the medical industry and the growth of medical companies (Sadeghi & Rad, 2018). The talent demand trends, problems, and solutions in Henan Province aim to improve talent quality, and help Henan medical companies gain a competitive advantage (Cheng et al., 2022). Henan medical industry enterprises are primarily located in Zhengzhou, Xinxiang, Anyang, and Luoyang. Zhengzhou's industrial environment and gas location have led to increased job opportunities (Cheng et al., 2022). The city's policy environment, including the "13th Five-Year Development Plan for Zhengzhou Biomedical Industry," supports the growth of the industry and provides financial support for planning implementation (Cheng et al., 2022).

Henan Province's implementation plan for promoting healthy medical industry growth aims to generate \$100 billion in revenue from bio-medicine, chemical medicine, traditional Chinese herbal medicine production, medical equipment, and appliances by 2020 (The Government of Henan Province, 2022). This will focus on chemical medicals, bio-medicals, and proprietary Chinese medicines. The "Thirteenth Five-Year Plan" is expected to break through the health, health, and medical care industries, leading to a golden period of development. Medical students are increasingly sought after in areas like elderly care, health care, biomedical manufacturing, and two-child policy implementation (Xue & Liu, 2021).

The development of an innovation network between cities through knowledge flow and technical cooperation has significantly improved regional scientific and technological innovation levels and





economic growth (Ruvio et al., 2014). The trend of inter-city collaborative innovation is transforming urban development, and the network perspective is increasingly being introduced in urban innovation research (Zhu et al., 2022). The structure of an innovation network affects the integration and utilization of regional innovation resources, directly affecting the efficiency of the innovation system. Scholars (Wang & Ahmed, 2004; Tajdini & Tajeddini, 2018; Chung, Yang & Marhold, 2022) are increasingly focusing on urban innovation network connections to enhance economic development performance.

Schumpeter (1991) emphasized the importance of innovation in organizations, which emerged in the 1950s. He found that most innovation diffusion literature focuses on the capabilities for innovating within organizations. In today's dynamic and unpredictable business world, global competition is under pressure, leading to increased attention to innovation (Kamkankaew et al., 2022). Companies' success relies on their capacity for innovation, which can take various forms, such as new products, services, production methods, marketing strategies, or distribution networks (Damanpour & Schneider, 2006). Innovation is essential for setting companies apart from rivals, fostering flexibility, and spreading new ideas (Dadfar et al., 2013). Long-term success in organizations can be achieved by establishing innovation goals at the organizational level and fostering the development of innovation-driven capacity (Capello & Lenzi, 2019).

The medical sector is poised to emerge as a leading contributor to China's economy in the next few years. The researcher aims to investigate the degree of innovation management within the medical industry in Henan province as a means of advancing the field. The information gathered from this study will be utilized for this purpose.

Research Objective

1. To explore the perception level of innovativeness from the employee perspective of the medical industry in Henan Province, China
2. To study the guidelines of innovativeness to improve business management in the medical industry in Henan Province, China

Literature Review

Definition of Innovativeness: Innovativeness is a concept that encompasses various definitions and can be defined as the ability to introduce novel products or attract new clients through behavioral and procedural innovations (Ruvio et al., 2014). It is a mindset that encourages creativity and new ideas and can be applied to various contexts (Zhu et al, 2022). An innovative organization is considered innovative if it can create a foundation for innovation and fosters the adoption of new ideas. The definition of innovativeness remains undetermined, but it often involves introducing new products or processes into existing systems. Organizational innovativeness is a cultural trait that represents an organization's intent to seize new opportunities, develop the ability to innovate and implement successful ideas.

Dimension of Innovativeness: Innovativeness refers to an organization's ability to introduce novel items or create new commercial opportunities through strategic practices (Chung, Yang & Marhold, 2022). Creativity is crucial for thriving enterprises, but few studies have explored the lag time between creating and evaluating innovativeness components. Most studies have limited dimensions, making it difficult to accurately measure inventiveness (Wang & Ahmed, 2004; Tajdini & Tajeddini, 2018; Chung, Yang & Marhold, 2022). Innovation can be quantified through product and process innovation, but the scope of these studies is too narrow, potentially misleading results. Further research is needed to improve the measurement of inventiveness and its measurement. This study measures innovativeness using a modified version of Wang & Ahmed's (2004) instrument, focusing on product, market, process, behavioral, and strategic aspects. It assesses originality through five aspects, using organizations as the unit of analysis.

Conceptual Framework

The author of the aforementioned review has constructed a conceptual framework for the research, which can be seen in Figure 1.



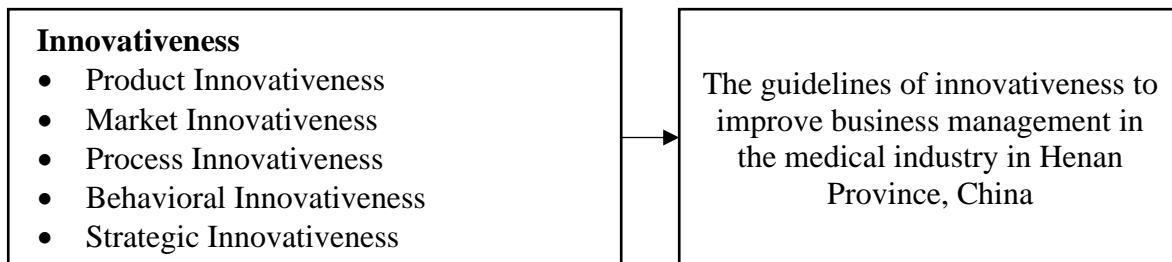


Figure 1 The conceptual framework of this study

Research Methodology

Population and Sample Size: The 5,500 employees who are working in the medical industry in Henan Province, China, are the population of this research (The Government of Henan Province, 2022). To determine the sample size of this study, the number of 360 employees in the medical industry in Henan Province is identified. The sample size was calculated based on Yamane (1973). As a result, the total sample size for the research will be 360 employees in the medical industry in Henan Province. These will represent the total population. The researcher used an original paper questionnaire to facilitate a sampling approach that has been worked for the medical industry in Henan Province.

Research Tools: The questionnaire was used as a tool to collect data in this study, and the researcher constructed a questionnaire from the related concept and theory, academic research journals related to studied variables innovation management and business strategy which are shown in Table 1.

Table 1 Research variables and measurements

Research variables	Source	Number of Items
Product Innovativeness	Wang & Ahmed (2004)	4
Market Innovativeness	Tajeddini (2016)	4
Process Innovativeness	Sadeghi & Rad (2018)	4
Behavioral Innovativeness	Chung, Yang & Marhold (2022)	4
Strategic Innovativeness		4

The questionnaire was developed based on five variables. The measure items are close-ended response questions about the perception of product innovativeness, market innovativeness, process innovativeness, behavioral innovativeness, and strategic innovativeness.

For measurement of the perception of product innovativeness, market innovativeness, process innovativeness, behavioral innovativeness, and strategic innovativeness, the interval scale was used, a five-point Likert Scale, to measure the level of agreement. The five-point Likert scale was ranked below (Likert, 1932):

- | | | |
|---|---|---------------------------------|
| 5 | = | the highest level of perception |
| 4 | = | the high level of perception |
| 3 | = | the moderate perception |
| 2 | = | the low level of perception |
| 1 | = | the lowest perception |

- The width of the class interval was defined by utilizing the formula as follows (Sauro & Lewis, 2011):
- | | | |
|-----------|---|--|
| 4.21-5.00 | = | The respondent's acceptance of all variable factors is the highest level of perception |
| 3.41-4.20 | = | The respondent's acceptance of all variable factors is a high level of perception |
| 2.61-3.40 | = | The respondent's acceptance of all variable factors is the moderate perception |
| 1.81-2.60 | = | The respondent's acceptance of all variable factors is a low level of perception |
| 1.00-1.80 | = | The respondent's acceptance of all variable factors is the lowest perception |





Cronbach's alpha coefficient was used to do statistical analysis to find the reliability of each variable factor from 30 pilot respondents. The value of Cronbach's alpha must be between $0 \leq \alpha \leq 1$; the higher value means higher reliability and is closely related to the section. Based on the above, Cronbach's alpha (α) of each factor in this research was from 0.680 to 0.750 for 30 pilot test results. Therefore, the reliability of all the indices in the pilot test and the full-scale survey was conducted and was good. Cronbach alpha (α) of all the variables passed the benchmark of 0.65 (Craig & Moores, 2006).

Data Collection: Primary data consisted of information collected straight from respondents. The questionnaire was the research instrument of choice. The researcher read a substantial number of articles, documents, and publications before deciding on a research topic and developing survey questions. As a result, between the months of February to May 2022, we gathered data from 360 individual questionnaires. Completed questionnaires were double-checked for accuracy using both student and adviser suggestions before data analysis began. Data were entered into a statistical program in its raw form from filled-out surveys for further processing and analysis. After that, we did the calculations, analyzed the data, and summarized the findings. In this case, secondary data was easily accessible. The research team gathered information from a wide range of resources, such as textbooks, academic journals, paperwork, websites, company profiles, and other documents.

Data Analysis: The completed questionnaire served as the basis for arriving at the weight determined based on the predetermined requirements. Using a statistics tool, the information was saved to a file. In the identical approach as in to present the first research of objective, the calculation of the mean and standard deviation was utilized to investigate the employee perception in the questionnaires. To present the second research objective, the findings of the first objective of the research will be categorized, and descriptive statistics will be utilized in the process of generating descriptions for the guidelines of innovativeness to improve business management in the medical industry in Henan Province, China.

Statistics Used in Data Analysis: Statistical values such as percentage, frequency, mean, and standard deviation were used for data analysis to define the information that was presented in the form of a descriptive table. These statistical values were utilized as part of the statistics that were employed in the study of the data.

Result

To provide the first research objective of the study is to explore the perception level of innovativeness from the employee perspective of the medical industry in Henan Province, China. This section covers the perception level of innovativeness from the employee perspective of the medical industry in Henan Province, which are product innovativeness, market innovativeness, process innovativeness, behavioral innovativeness, and strategic innovativeness.

Table 2 shows the overall level of agreement with this study

Variables of innovation management	Mean	S.D.	Meaning
Product Innovativeness	3.00	0.74	moderate
Market Innovativeness	3.38	0.56	moderate
Process Innovativeness	3.68	0.87	high
Behavioral Innovativeness	3.63	0.62	high
Strategic Innovativeness	3.50	0.54	high
Total	3.43	0.66	high

As table 2 provides the perception level of innovativeness from the employee perspective of the medical industry in Henan Province, which are product innovativeness, market innovativeness, process innovativeness, behavioral innovativeness, and strategic innovativeness. The results indicated that all of the variables had a high level (mean score = 3.43, S.D. = 0.66), especially process innovativeness (mean score = 3.68, S.D. = 0.87), behavioral innovativeness (mean score = 3.63, S.D. = 0.62), strategic innovativeness (mean score = 3.50, S.D. = 0.54), market innovativeness (mean score = 3.38, S.D. = 0.56) and product innovativeness (mean score = 3.00, S.D. = 0.74) accordingly.





To provide the second research objective of the study is to study the guidelines of innovativeness to improve business management in the medical industry in Henan Province, China. This section covers the guidelines of innovativeness to improve business management in the medical industry in Henan Province, China, based on the result of the previous section as the details are:

Product innovativeness refers to a company's propensity to develop new products and services, which provides the company with a competitive advantage over other businesses in the same industry. When determining whether or not a product is innovative, it is necessary to take into consideration not just the product's originality but also its inventiveness. This can be done from either the perspective of the buyer or the seller, taking into account the qualities, potential dangers, and outcomes of the transaction. The history of a firm as a pioneer in a certain industry is directly related to the capacity of the business to introduce new products and services that feature cutting-edge innovations in both technology and business practices. When it comes to introducing new products or services to the market, the company can demonstrate the advantages of these innovations and has a track record that is superior to that of its rivals.

There is a strong connection between originality in the market and ingenuity in the production of new goods. The marketing process is dependent on market innovation, which entails the production of characteristics that can be leveraged to break into untapped markets or launch novel products. This may be thought of as the "creation of traits that can be leveraged to break into untapped markets." All aspects of marketing, including market research and analysis, advertising, and promotional marketing, work together. The process of creating models or prototypes of novel products and services before introducing them to consumers on the market. The growth of current sectors is propelled in large part by the use of novel, inventive, inventive advertising methods that make use of cutting-edge technologies to specifically target consumers and promote new items.

The focus of process innovation is on technological and processing innovations, whereas the attention on technology innovation is directed toward the development of new technologies for use in process management and method development. To develop novel goods and services, process innovation necessitates an openness to new technologies and a willingness to re-engineer existing ones. Process innovation includes crucial components such as the improvement and oversight of existing firm processes, as well as the development of unique techniques to address concerns and difficulties to increase production speeds.

Because innovative behavior can be affected on an individual, a group, and an organizational level, there is no single metric that can be used to accurately measure innovative behavior. The degree of commitment to innovation that an organization has can be deduced from actions such as changing business practices, for example. An example of behavioral innovativeness is when individuals are willing to make changes to the patterns of behavior they typically exhibit and can generate new ideas. The attention of managers to the process of strengthening already established methods results in an expanded opportunity for originality. The degree to which a person is innovative in their behavior is inversely proportional to the culture of an organization. Innovation in behavior encourages creative thinking, an openness to a variety of points of view, and the pursuit of methods that are both better and more efficient.

Strategic innovation is a difficulty for many different kinds of organizations since there is sometimes an insufficient desire to change, and there is always the chance of unintended consequences. Academics are starting to realize that strategic innovation, even though relatively little research has been done on the topic in the past, is a crucial component of organizational innovation. In addition to resolving issues and reorganizing functions and responsibilities, the creation of new products and services through research and the utilization of resources that are already available are all aspects of strategic innovation. Research and utilization of resources already accessible. When it comes to the implementation of novel concepts, vision is a necessary quality for a manager to possess.

In conclusion, product innovativeness refers to a company's ability to develop new products and services, providing a competitive advantage over competitors. Market innovation involves ingenuity in producing new goods, while process innovation focuses on technological and processing innovations. Behavioral innovativeness involves individuals changing behavior patterns and generating new ideas. Strategic innovation is a challenge for organizations, but academics recognize its importance

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in resolving issues, reorganizing functions, creating new products and services, and utilizing available resources. Vision is a necessary quality for managers to effectively implement novel concepts.

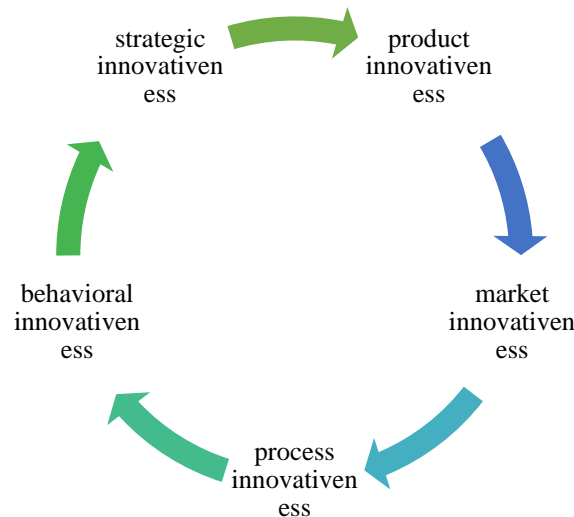


Figure 2 The guidelines of innovativeness to improve business management in the medical industry in Henan Province, China

Conclusion

The study examines employee perceptions of innovativeness in the medical industry in Henan Province, focusing on product, market, process, behavioral, and strategic variables. Results show high levels of innovativeness, particularly in process, behavioral, strategic, market, and product areas. Product innovativeness involves a company's ability to develop new products and services, providing a competitive advantage. Market innovation involves ingenuity, process innovation focuses on technological and processing innovations, and behavioral innovativeness involves individuals changing behavior patterns. Strategic innovation is crucial for resolving issues and utilizing resources.

Discussion

Based on the results of the initial research objective, which sought to investigate the degree of innovativeness perceived by employees in the medical sector of Henan Province, China, the average score for overall innovativeness was found to be significantly high. The aforementioned statement aligns with the findings of Sadeghi & Rad (2018) scholarly investigation on the justification and determinants of fostering innovation within small and medium-sized enterprises operating in the service industry. The study's results indicate that digital technology, business transformation, and system factors exerted a significant impact on the organizational factor, while the innovation organization factor demonstrated a substantial influence on business performance. Furthermore, the study conducted by Capello & Lenzi (2019) delved into the innovative strategies employed by enterprises in managing their operations within the knowledge economy. The findings of the research centered on the analysis of the factors that influence enterprise management in the knowledge economy, with a particular focus on three key areas: innovation management, knowledge management, and talent management. This study aims to present the experiences and practices of globally renowned companies and investigate innovative corporate management strategies about strategic planning, organizational systems, environmental atmosphere, technological innovation, knowledge management, intellectual property protection, and talent incentives. The objective is to offer industry reference value. Chung, Yang & Marhold (2022) study posits that the enterprise management mode serves as a framework for guiding business activities, which is developed over an extended period and encompasses various management elements such as enterprise management regulations, organizational structure, corporate culture, financial management, human resource management, and other enterprise-related aspects. The

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attainment of optimal levels of enterprise management efficiency is subject to various limiting factors. In the context of innovative change, there exist certain limitations, such as the need to cater to particular market demands, the requirement for production technologies that can accommodate large-scale operations, and the maturity structure of products.

The second research objective pertains to the examination of guidelines for innovativeness in enhancing business management within the medical sector of Henan Province, China. The statement aligns with the research conducted by Damanpour & Schneider (2006), which explored the impact of management innovation on the achievement of business enterprises. The study's results indicate that enterprises situated in Chachoengsao Province prioritize the factors that impact Management innovation success to a considerable extent. This finding holds significant implications. The aforementioned statement is in alignment with the findings of Wang & Ahmed (2004) study, which revealed that the implementation of management process innovation yields favorable outcomes in terms of financial performance and customer operations. The aforementioned is a managerial task that entails considerable accountability for resource allocation in devising tactics to achieve corporate goals, alongside the execution of administrative procedures within the enterprise and the realization of educational and developmental objectives. Kamkankaew et al. (2023) study reveals that the management of business innovation has a significant impact on the functioning of small and medium-sized enterprises (SMEs) in the northeastern region of Thailand. The study's results indicate that the implementation of management innovation has a favorable and direct impact on the performance of small and medium-sized enterprises (SMEs). This outcome aligns with the research hypothesis, which posits that when a business undergoes management innovation, such as restructuring the organizational framework, resource management, and strategic planning, it can enhance its overall performance. The efficient management of business innovations that impact the operations of small and medium-sized enterprises (SMEs) is an inevitable outcome.

Recommendation

Managerial Recommendations

Based on the empirical evidence presented in this study, the following managerial recommendations can be proposed by this paper:

The inquiry revealed that the research outcomes about innovation management were of superior quality. It was concluded that entities ought to cultivate an environment that promotes organizational creativity to attain sustained progress. The effective management of network relationships and the provision of superior service can significantly influence an organization's operations, including its overall reputation. The success of an organization is contingent upon its ability to engage in productive collaboration with its network. It was leveraging innovative approaches to create novel products or services to secure a competitive edge for the enterprise. The organization's strategic planning involves enhancing production flexibility to cater to the demands of customers or consumers. Additionally, the organization intends to explore new markets in response to emerging technologies utilized in production or service business performance. This approach encompasses various aspects, such as customer service and personnel learning and development. Achieving a competitive edge in the forthcoming era would require enhanced efficacy across all four domains, thereby promoting sustainable development.

Further research Recommendations

Based on the empirical evidence presented in this study, the following future research recommendations can be proposed by this paper:

To establish a sustainable industry, it is imperative to undertake a comparative analysis of data across various nations and conduct research on the degree of contentment experienced by customers. The implementation of these procedures is likely to yield enhanced output and facilitate the informed advancement of the organization.

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