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Facing Future Uncertainties in the Pharmaceutical Industry Using a Strategic Intelligence Model

Masoumeh Kazemi
Assistant Professor, Department of Futures Studies, Faculty of Governance, University of Tehran, Tehran, Iran/ Masoumeh.Kazemi@ut.ac.ir
Saied Samiie*
Assistant Professor, Department of Futures Studies, Faculty of Governance, University of Tehran, Tehran, Iran/ S.Samiie@ut.ac.ir

Abstract

Purpose: Uncertainty, complexity, and dynamism are three characteristics of the environment that surround 21st-century organizations and have caused their instability. Due to the advancement of technology, increasing competition, and multiple stakeholders, the pharmaceutical industry faces countless uncertainties and complexities. It can use strategic intelligence as an effective mechanism to deal with these conditions. Accordingly, the present study aims to present a comprehensive model of strategic intelligence in the pharmaceutical industry.
Method: This study is applied research from the viewpoint of the goal and uses the grounded theory and specifically the systematic model of Strauss and Corbin as a type of strategy available in the qualitative research approach. The data-gathering tools were interviews. The study population included experts from different sectors of the pharmaceutical industry, such as experts in pharmaceutical technologies, research and development, strategic management, and marketing, as well as experts in pharmaceutical industry policymaking for the public sector. Purposive sampling was used and finally, theoretical saturation was achieved by conducting 22 interviews.
Findings: In the open coding stage, 560 statistical codes were classified into 25 subcategories. Finally, the three categories of technology pressure, market pressure, and uncertainty as causal conditions; two categories of knowledge management and perspective building as the core category; individual and organizational factors as the context conditions; thought system and political-economic conditions in the form of micro and macro factors as intervening conditions; two factors of reorganization and empowerment as strategies; and support and survival were identified as outcomes.
Conclusion: Today, the pharmaceutical industry is facing countless developments in various fields, including complex research and development processes, the continuous creation of innovative drugs, and responses to unmet needs, which has caused companies active in this industry to face a future full of uncertainty. Strategic intelligence is a mechanism that provides the opportunity for companies active in this field to face these uncertainties. Strategic intelligence can provide fundamental insights to inform and guide the decisions, policies, and actions of companies. Anticipating current changes that will create threats and opportunities, creating an inspiring vision of the future, and partnering with others that complement their abilities and capabilities will be provided through strategic intelligence for these companies

Keywords: Intelligence, Strategic Intelligence, Uncertainty, Pharmaceutical Industry

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Publisher: Imam Khomeini International University
Corresponding Author/ E-mail: Saied Samiie S.Samiie@ut.ac.i

Introduction

Modern organizational environments differ greatly from historical ones (Hitt et al., 2017, p. 100). This shift is due to rapid technological advancements, the need for adaptation to new production methods, increased diversity, changing customer priorities, heightened competition, and information overload from globalization (Gitelman et al., 2021; Maccoby & Scudder, 2011; Şener, 2012; López-Robles et al., 2019; Kuosa, 2011). The 21st century's instability stems from volatile environments, complicating predictions, and strategic clarity (Poplavska et al., 2019; Kouzes & Posner, 2017; Moran, 2009). A framework for future-oriented strategic thinking is crucial (Shirazi & Alba, 2024). Organizational success depends on environmental awareness for effective decision-making and competitiveness (Xu & Kaye, 2007; Seitovirta, 2011). Ignoring uncertainty risks competitiveness (Ejdys et al., 2015), while proactive adaptation is vital for survival (Gitelman et al., 2021). Success relies on responding to new opportunities and threats (Gattringer & Wiener, 2020). Strategic intelligence from ongoing environmental scanning and adaptation (Pellissier & Kruger, 2011; Shirvani Nagani et al., 2019) is essential for industry leadership, requiring strong information acquisition and analysis for timely insights (Mukherji & Mukherji, 2016).

The global pharmaceutical industry faces significant challenges, including complex R&D (Jung et al., 2023), diverse stakeholders (Miozza et al., 2024), increasing internationalization, ongoing innovation, unmet medical needs (Nakashima et al., 2023), patent expirations, generic competition (Levis & Papageorgiou, 2004), and fluctuating raw material prices (Marques et al., 2018). These factors create considerable uncertainty. Strategic intelligence is essential for decision-making, providing relevant information (Marchand & Hykes, 2077, p. 2) and insights (De Smedt, 2008, p. 92) to guide organizations in maintaining competitiveness and making informed choices. It helps decision-makers plan for the long term and mitigate risks associated with potential disruptions (PurityU et al., 2017, p. 90; Bernhardt, 2003, p. 30). While there is research on strategic intelligence in other sectors, a comprehensive model for the pharmaceutical industry is lacking. This study aims to fill that gap by interviewing Iranian pharmaceutical experts and utilizing grounded theory to develop a strategic intelligence model that addresses future uncertainties, focusing on effective strategies, influencing factors, and implementation outcomes.

Materials and Methods

This study is applied research that uses grounded theory within the qualitative research framework, specifically following the Strauss and Corbin model. Data was primarily collected through interviews with experts from diverse sectors of the pharmaceutical industry, including specialists in pharmaceutical technologies, research and development, strategic management, marketing, and public sector policymakers. A purposive sampling approach was utilized, achieving theoretical saturation after 22 interviews.

Results

After three stages of analysis, 560 codes from the open coding stage were categorized into 25 subcategories in the axial coding stage and then 6 main categories in the selective coding stage. Three causal conditions identified were technological pressure, market pressure, and uncertainty. Knowledge management and visioning emerged as core categories. Individual and organizational factors were classified as context conditions. The analysis revealed the intellectual system and political-economic factors as intervening conditions, categorized into micro and macro. Strategies included reorganization and empowerment, while support and survival were noted as consequences. Findings from the coding processes are shown in Table 1.

Table 1. Open, axial, and selective coding

-	Selective coding	Axial coding	Open coding
Causal conditions	Technology pressure	Timely information	Information overflow, information quantity and quality, and inconsistency, the need for multiple sources of information
		Innovation absorption	Innovation models, identification of modern technologies, use of analytical data, need for business initiative
	Market pressure	Customer-centric	Identifying customer needs, determining customer priorities, the need to quickly align with customer needs
		Competition conditions	Identifying current and new competitors, expanding the level of competition to international markets, determining competitors' capabilities
	Uncertainty	Self-renewal	Communication between subsystems and their combined performance, increasing implicit connections, solving new problems
		complexity	Multiplicity stakeholders, expanding the dimensions of the industry
Context conditions	Knowledge management	direction	Type of information required, prioritization of information, determination of indicators and criteria in information collection
		Data gathering	Identifying opportunities and threats, blind spots, customer needs, competitors and technologies, trends and macro trends
		Data analysis	Database creation, empirical calculations, data mining, process mining, analytical processing, intuitive analysis
		dissemination	How to send data, what kind of information should be provided to whom, and when
	Visioning	imagination	Predicting events, estimating the future, considering future images, determining the time horizon, developing a roadmap
		Inspirational management	Understanding situations, understanding dependencies, understanding priorities, understanding disruptive, emerging, and surprising elements
Context conditions	Individual factors	Managers' capabilities	Resource mobilization, facilitation role, practical action and management involvement, transformational style, crisis thinking
		Employee capabilities	Ideation and creativity, divergent and systemic thinking of employees, long-term thinking, commitment to collective wisdom,
	Organizational factors	Organizational culture	Providing a platform for teamwork, creating an atmosphere of cooperation, belonging, and corporate identity

		Organizational structure	Information infrastructure (hardware and software), bandwidth, degree of digitalization of decision-making
Intervening condition	Reorganization	External networking	Interaction with leading companies, technology hubs, policymakers, universities, power centers, and research centers
		Internal networking	Employee interaction, interaction between different departments, interaction with stakeholders and investors
		Structure design	Renovating and redesigning structures, forming multidisciplinary teams, creating an observatory
	Empowerment	Training	Training courses, specialized conferences, development of specialized skills of employees and managers
		Motivation	Promoting belief in information sharing, creating belief in realizing the vision, motivating employees through incentives
		Openness	The flow of ideas, new ideas, and opinions, investment in new ideas
Consequences	Support	Improve decision-making	Providing the required information, multidimensional perspective, making sound decisions, presenting more alternatives
		Risk management	Avoid surprises, reduce uncertainty, reduce future risk
	Survival	Competitiveness	Identifying opportunities and threats, early warning system, creating opportunities for action, increasing competitiveness
		Productivity	Better performance, increased quality, increased profitability
		Development	Increasing readiness and providing the ground for growth, modernization, and transformation, expanding the field of activities

Discussion

As the global economy becomes more complex, uncertainty rises, forcing companies to adapt to unpredictable changes, especially in high-tech sectors. The pharmaceutical industry faces significant risks due to lengthy and intensive R&D processes, requiring collaboration across biology, chemistry, and medicine (Jung et al., 2023), alongside regulatory compliance. In this environment, success depends on the ability to anticipate changes faster than competitors and to envision the future. Preparing for changes ahead of rivals is crucial for competitive advantage and survival, making strategic intelligence essential. This study develops a strategic intelligence framework to address uncertainties in the pharmaceutical sector, filling gaps in existing models. Researchers interviewed 22 experts in management, marketing, and policy to refine the model using grounded theory. The analysis generated 560 initial codes, categorized into 25 subcategories and key themes: technological pressure, market pressure, and uncertainty, reflecting information overload and diverse stakeholder demands. Gitelman (2021) emphasizes that business success hinges on understanding customer needs and timely information, achievable through strategic intelligence. Kori et al. (2021) highlight that strategic intelligence meets the information demand linked to uncertainties, enhancing predictions for stakeholders.

Knowledge management and visioning are crucial to the core category. Key aspects include identifying opportunities and threats, collecting relevant

information, analyzing data, recognizing surprises, and disseminating insights effectively. Scholars like Kuosa (2011), and Walsh and Harrison (2021) highlight visioning's importance in strategic intelligence. Additionally, Santa Soriano and Torres Valdes (2021) stress that effective knowledge management is vital for strategic intelligence, while Pellissier and Kruger (2011) emphasize knowledge transfer and storage. Individual and organizational factors are essential contextual conditions, primarily involving managerial capability, organizational culture, and structure. Maccoby and Scudder (2011) stress the significance of team building, collaboration, and interactive methods. Mahdi et al. (2019) note that the characteristics of leaders and managers significantly enhance the implementation of strategic intelligence. McDowell (2009) asserts that creative and intuitive thinking among managers and employees is critical for effectively applying strategic intelligence.

Intervening conditions were divided into micro and macro factors, focusing on the intellectual system and political-economic conditions. Strategies included two main aspects: reorganization and empowerment, with subcategories like training, networking, and structural design. Researchers such as Santa Soriano and Torres Valdes (2021), Gitleman (2021), and Maccoby and Scudder (2011) pointed out the importance of networking for strategic intelligence. Trim and Lee (2008) emphasized structural design and information units in organizations. The outcomes of strategic intelligence were categorized as support and survival, leading to improved decision-making, risk management, productivity, and competitiveness. Maccoby and Scudder (2011) noted that designing competitive products is a vital outcome, while Pellissier and Kruger (2011) highlighted decision-making and market development as important results. The pharmaceutical industry is undergoing major changes, with advancements in production, R&D, supply chain, and commercial operations. This evolving landscape indicates shifts in customer demands from testing to market launch. The industry is science-based, network-oriented, market-focused, and control-driven. Scientific rigor is crucial for R&D and recognizing tech trends. Effective information sharing among companies is essential. Gathering customer insights and competitive intelligence is necessary. Additionally, prioritizing risk management helps identify potential threats early. Strategic intelligence is vital for organizations to proactively collect, analyze, and share information in these areas.

References

Alomian, N. R., Alsawalhah, A. A., & Almarshad, M. N. (2019). The Impact of Strategic Intelligence on Achieving Competitive Advantage: Applied Study on the Pharmaceutical Companies Sector in Jordan. International Journal of Business and Social Science, 10(4),66-74. https://doi.org/10.30845/ijbss.v10n4p8

Banerjee, T., & Siebert, R. (2017). Dynamic impact of uncertainty on R&D cooperation formation and research performance: Evidence from the bio-

pharmaceutical industry. Research Policy, 46(7), 1255–1271. https://doi.org/10.1016/j.respol.2017.05.009

Bernhardt, D. (2003). Competitive Intelligence: How To Acquire & Use Strategic Intelligence & Counterintelligence, Pennsylvania State, FT Prentice Hall.

Creswell, J. W. (2022). Qualitative Inquiry and Research Design: Choosing Among Five Approaches. Translated by Hassan Danaeifard and Hossein Kazemi. Sixth edition, Tehran: Elias Publications. (In Persian)

Danaei Fard, H. (2023). Strategies of Theory Building. Fifth edition, Tehran: Organization for Researching and Composing University textbooks in the Humanities (SAMT) (In Persian)

De Smedt, P. (2008). Strategic Intelligence in Decision Making. In C. Cagnin, M. Keenan, R. Johnston, F. Scapolo, & R. Barré (Eds.), Future-Oriented Technology Analysis: Strategic Intelligence for an Innovative Economy (pp. 89–102). Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-540-68811-2_7

Ejdys, J., Nazarko, J., Nazarko, Ł., & Halicka, K. (2015). Foresight application for transport sector. In M. Fiorini & J.-C. Lin (Eds.), Clean Mobility and Intelligent Transport Systems (pp. 377–400). The Institution of Engineering and Technology. https://doi.org/10.1049/PBTR001E_ch17

Esmaeili, M. (2019). Survey of Iran's Pharmaceutical Industry. Tehran: Middle East Bank Economic Research Department (In Persian)

Fleisher, C. S. & Bensoussan, B. E.(2015). Business and Competitive Analysis: Effective Application of New and Classic Methods, Second Edition, Ft Pr

Gattringer, R., & Wiener, M. (2020). Key factors in the start-up phase of collaborative foresight. Technological Forecasting and Social Change, 153, 119931. https://doi.org/10.1016/j.techfore.2020.119931

Gholi Motlagh, M., Ghasemi, H., Mohammad Hosseini, B., Masaeli,, R., & Fazli, S. (2022). Future Scenarios of the Industry (Case Study: Medical Device Industry in Iran). Journal of Iran Futures Studies, 6(2), 79-109. Doi: 10.30479/jfs.2022.16157.1331 (In Persian)

Gitelman, L. D., Kozhevnikov, M. V., & Chebotareva, G. S. (2021). Strategic intelligence of an organization amid uncertainty. International Journal of Energy Production and Management, 6(3), 294–305. https://doi.org/10.2495/EQ-V6-N3-294-305

Hashemi Meshkini, A. (2023). Critique of the government's position in the pharmaceutical industry, series of meetings of experts on the country's pharmaceutical system on the path to joining the World Trade Organization. Tehran (In Persian)