

Analysis of the Implementation of Intelligence Strategies in Hospital Pharmacy Departments

Noveyla Hardhaning Tyas, Masydzulhak Djamil, Dudi Permana, Erna Sofriana Imaningsih

Mercu Buana University, Indonesia

noveylahardhaningtyas.dr@gmail.com

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ABSTRACT

Strategic Intelligence is a systematic process of collecting, analyzing, and leveraging relevant information to support decision-making and strategy development. It involves a deep understanding of the business environment, competitors, market trends, and other factors influencing an organization's success. By using strategic intelligence, organizations can identify opportunities, anticipate threats, and take appropriate steps to achieve their goals effectively. Pharmacy departments in hospitals have significant potential to generate significant revenue for the hospital. However, pharmacies often face a number of challenges that hinder operational efficiency and effectiveness. These challenges include large and excess inventories, high values of expired medications, long waiting times to obtain medications, and stock shortages. To address these challenges, the implementation of strategic intelligence in pharmacy management becomes crucial. By collecting and analyzing relevant data, pharmacies can identify patterns in medication demand, inventory trends, and causes of stockouts. By leveraging insights generated from data analysis, pharmacies can develop strategies to optimize inventory, improve the efficiency of medication delivery processes to patients, and manage medication stocks more effectively. Thus, the implementation of strategic intelligence can help hospital pharmacies improve performance, reduce waste, and enhance patient satisfaction, thus supporting the creation of more efficient, effective, and sustainable pharmacy units in the long run.

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INTRODUCTION

Society5.0 is a concept introduced by the Japanese government which aims to create a human-focused society and utilize technological advances, especially information technology and artificial intelligence, to improve society's welfare (Shah, 2023). Society 5.0 relies heavily on the development of the Internet of Things (IoT), where everyday devices and objects are connected to the internet. This creates an ecosystem that enables broader and deeper data exchange between devices, facilitating smarter decision making (Abbas, 2018). Big data analytics can be used to make better decisions, identify trends, and respond to changes in society.

In Society 5.0, this technology can be used to create a more engaged and relevant environment. Blockchain technology can be used to increase security and transparency in transactions and data exchange. This can support data security and authenticity, especially in domains such as finance, logistics and public services (Bader, 2018). 5G network development is very important to support fast and reliable connectivity between devices. This enables real-time data exchange, supporting applications that require low latency such as autonomous vehicles and connected medical devices. In an increasingly connected society, cybersecurity has become critical (Duggan, 2020). Advances in

cybersecurity technology are necessary to protect personal data, critical infrastructure, and vital information systems. Society 5.0 also pays attention to sustainability and environmental protection (Harori, 2020). The use of green and environmentally friendly technologies in the energy, transportation and production sectors can help create a sustainable society (Agaba et al., 2023; Iskanto, 2023; Iskanto & Juariyah, 2023; Lamin, 2022).

The strategic intelligence process involves the following steps. The first step in this process is to collect relevant information from various sources, both internal organizational data and external information from the market, competitors and other business environments. This information can take the form of numerical data, financial reports, market reports, trend analysis, and interviews with stakeholders. After the information is collected, the next step is to analyze the data and information using various analytical methods such as statistical analysis, SWOT analysis (Strengths, Weaknesses, Opportunities, Threats), benchmarking analysis, and other analysis techniques. The goal of this analysis is to identify relevant patterns, trends, and relationships to gain a deeper understanding of the organization's internal and external conditions. The analysis results are then interpreted to produce meaningful and relevant insights for strategic decision making. The information obtained from this process is then presented in a format that is easy to understand and used to assist organizational leaders in making better decisions. The results of the strategic intelligence process are used as a basis for formulating organizational strategies, identifying new opportunities, anticipating risks, and adapting organizational actions to changing market and environmental conditions. Strategic decisions taken based on information collected and analyzed in the strategic intelligence process are expected to improve organizational performance and achieve set goals (Ikhsan, 2023; (Obiweluzor & Ogunbiyi, 2022)).

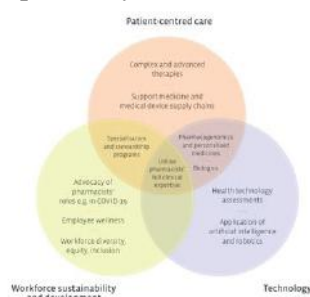
Strategic Intelligence in the Pharmacy Department is very important because it acts as a strong foundation for making appropriate and effective decisions in facing various challenges and opportunities that exist in the pharmaceutical industry (Kamba, 2023). The pharmaceutical industry continues to change rapidly, including changes in market demand, technological developments, and regulatory changes. With strategic intelligence, pharmaceutical departments can monitor current market trends, analyze their impact, and adjust their strategies in a timely manner. Strategic intelligence helps pharmaceutical departments manage supply chains efficiently (Kanagaraj, 2022). By understanding market demand, drug use patterns, and consumer behavior, pharmaceutical departments can plan drug production and distribution more accurately and effectively. With information obtained through strategic intelligence, pharmacy departments can identify areas where service quality can be improved (Kirilov, 2019). This includes increasing patient compliance with medication use, reducing waiting times at pharmacies, and increasing the timely availability of medications. The pharmaceutical industry is often subject to complex and diverse regulatory changes.

Strategic Intelligence allows pharmaceutical departments to stay up-to-date with new regulations issued by health regulatory bodies and ensure full compliance with applicable standards (Kodama, 2020). In an ever-changing environment, pharmacy departments need to continually seek innovation in their products and services. Strategic intelligence helps in identifying new opportunities for product development, use of new technologies, and strategic partnerships that can increase the competitiveness and long-term sustainability of pharmacy departments (Kruger, 2011). By better understanding the business and market environment through strategic intelligence, pharmaceutical departments can identify possible risks and develop appropriate mitigation strategies. This may include product safety risks, legal risks, or other operational risks.

There are a number of obstacles and advantages associated with implementing strategic intelligence in pharmacy departments, which influence how effective this tool is in optimizing operations and improving overall performance (Kung, 2021). One of the main obstacles is limited resources, including time, manpower, and budget available to conduct comprehensive and in-depth data analysis. The availability of incomplete or inaccurate data can hinder the pharmacy department's ability to generate meaningful insights (Laurenza. E., 2018). Sometimes, pharmaceutical data is spread across multiple systems that are not integrated, making it difficult to collect and integrate information effectively. Implementing the tools and technology necessary to conduct strategic intelligence may require significant investment. This includes costs for software, equipment, and employee training. Complex data analysis often requires special skills in statistics, mathematics, and information

technology (Liebowitz, 2006). Pharmacy employees may need additional training to develop these skills.

Figure 1. Emerging trends in hospital pharmacy (Source: (Bickerweg, 2022))



Strategic intelligence helps pharmacy departments make more informed and timely decisions. Information obtained from data analysis allows leaders to understand market trends, identify opportunities, and better anticipate risks (Maika, 2023). By leveraging strategic intelligence, pharmaceutical departments can optimize their supply chains more efficiently. They can plan drug production, distribution and inventory management more accurately, reducing the risk of stock shortages and waste. Strategic intelligence helps pharmaceutical departments identify new innovation opportunities in product and service development (Marín MA, 2015). By understanding consumer needs and preferences, pharmacy departments can develop relevant new products and services that meet patient expectations. By using strategic intelligence to monitor competition and identify market trends, pharmacy departments can maintain their competitive advantage in an increasingly tight market (Marín MA, 2020). By better understanding operational processes through strategic intelligence, pharmacy departments can improve their operational efficiency, reduce costs, and increase employee productivity.

Although there are several obstacles to implementing strategic intelligence in pharmacy departments, the benefits clearly outweigh these obstacles. With the right approach and a commitment to continuously improving capabilities, pharmacy departments can harness the full potential of strategic intelligence to improve their performance and achieve their strategic goals.

One approach to overcoming this problem is to apply strategic intelligence in pharmaceutical management (McDowell, 2009). The first step is to collect relevant data on drug demand patterns, supply trends, and drug compliance rates. By analyzing this data, pharmacy departments can identify patterns that may lead to excess or shortage inventory, as well as identify medications that are at high risk of expiring. By understanding drug demand and consumption patterns, pharmacies can optimize inventory and minimize waste (Abbas, 2018). Additionally, by utilizing data analysis, pharmacies can develop strategies to increase the efficiency of the drug delivery process to patients. This can include the implementation of more sophisticated systems to manage drug deliveries, real-time monitoring of drug inventory status, as well as the use of information technology to speed up the process of processing drug orders (Ahmad, 2023). By reducing patient waiting times and increasing drug availability, pharmacies can increase patient satisfaction and reduce complaints.

Furthermore, pharmacies can use data and analysis to identify patterns of drug demand related to the causes of drug stock shortages (Gonawan, 2022). By understanding these trends, pharmacies can develop strategies to improve inventory management, including negotiating contracts with suppliers, using automated alert systems to alert when drug stocks are approaching exhaustion, as well as developing policies to manage unexpected drug demand (Francisco J. Cantu, 2006). By implementing this approach, hospital pharmacies can improve their operational efficiency and effectiveness, reduce waste and out-of-stocks, and increase patient satisfaction. In doing so, they can be more effective in generating revenue and become more sustainable in the long term.

RESEARCH METHODS

This research uses a literature review method. A research literature review involves a comprehensive analysis of various published sources, such as research journals, scientific papers, and books, to gain an in-depth understanding of a particular topic (Haeria, 2017). This process includes identifying a research topic, searching for relevant sources of information using academic databases or search engines, selecting the most relevant and credible sources, evaluating their reliability and relevance, analyzing the selected sources, synthesizing the information obtained, compiling a research report based on findings and analysis, and citing references correctly (Handayani, 2022). By following these steps, authors can conduct effective literature reviews, enabling them to develop strong arguments, identify new research directions, and make meaningful contributions to the field of study.

DISCUSSION

Information Systems

The development of sophisticated information systems to collect, store, and analyze important data related to pharmacy management, including drug inventory, drug use, and patient outcomes, is an important step in improving the operational efficiency and effectiveness of pharmacy departments (Mendonca, 2021). The first step in developing an information system is identifying the specific needs of the pharmacy department, including the types of data that must be collected and analyzed to support appropriate medication management decisions. This involves mapping business processes and identifying key performance metrics that must be monitored and evaluated (Muamaroh, 2023). Next, information system developers must design and build appropriate technology infrastructure, including databases that can store large volumes of data safely and efficiently, as well as intuitive user interfaces to facilitate use of the system by pharmacy staff. Additionally, information systems should be designed to integrate data from multiple sources, such as inventory management systems, electronic patient records, and medication use monitoring systems, thereby enabling holistic cross-data analysis.

The use of advanced technology such as predictive analysis and artificial intelligence can also be utilized to analyze data in more depth, identify trends, and predict future patient needs (Munira, 2021). It is also important to pay attention to data security and compliance with privacy regulations, such as HIPAA, by implementing appropriate information security measures. Finally, training employees in the use of new information systems and interpretation of the resulting data is key to ensuring successful adoption and optimal use of the information systems that have been developed (Muslih, 2021). By following this approach, pharmacy departments can build sophisticated information systems that can provide valuable insights to support more efficient pharmacy management, improve patient care, and improve overall clinical outcomes.

Data analysis

Increasing the ability to analyze data to identify trends, patterns and strategic opportunities in pharmacy management is crucial in advancing the quality of service and operational efficiency of the pharmacy department (Prawiades, 2015). The first step in improving data analysis capabilities is ensuring the availability of quality and relevant data, including monitoring data on drug use, dispensing and patient feedback. This data collection must be carried out in a structured and regular manner to ensure the accuracy and completeness of the information collected. Furthermore, investment in adequate information technology infrastructure is needed to store and process large volumes of data quickly and efficiently (Pristiyono, 2023).

The use of sophisticated data analysis software, such as machine learning algorithms and predictive analysis, can help identify trends and patterns that may be difficult to detect with conventional analysis methods (Purnomo, 2021). Additionally, collaboration between pharmacy and data analytics teams can help in interpreting analysis results and generating valuable insights to support strategic decision making. It is also important to ensure that pharmacy employees receive appropriate training in data analysis, including the use of data analysis software and interpretation of analysis results, so that they can optimize the use of data to improve operational performance and patient outcomes (Qashlim, 2018). By adopting a holistic and sustainable approach to improving data analysis capabilities, pharmacy departments can identify new strategic opportunities in pharmacy management, increase operational efficiency, control costs, and significantly increase patient satisfaction (Riza, 2020).

Figure 2. The relationship between the different levels of intelligence (Source: LC Seitovirta work in (Marín MA, 2015))



The integration of strategic intelligence in the daily operations of pharmacy departments faces several obstacles that need to be overcome. One of the main obstacles is the lack of sufficient understanding of the concept of strategic intelligence and how to apply it in the pharmaceutical context (Sánchez, 2015). Many pharmacy staff may have backgrounds that focus more on clinical or administrative aspects than on strategy and business analysis, which can hinder strategic intelligence integration efforts. Additionally, there are sometimes gaps in communication and collaboration between pharmacy teams and other departments in the organization, such as finance or marketing management, which can hinder the effective use of strategic information (Tairas, 2023).

Changes in organizational culture can also be an obstacle, because it may require a paradigm shift from a more reactive approach to a more proactive and data-oriented approach (Gonawan, 2022). Additionally, technological and infrastructure constraints, such as limitations in information systems or data analysis software, can also be a barrier to integrating strategic intelligence into daily operations. Finally, the challenges of compliance with strict data privacy regulations and policies, particularly in terms of the use of patient data, also need to be addressed and addressed (Bruno, 2018). By identifying and addressing these barriers through education, interdepartmental collaboration, investment in technology, and development of a more proactive organizational culture, pharmacy departments can successfully integrate strategic intelligence into their daily operations, enabling them to make more informed and strategic decisions. .

Cross Team Collaboration

Encouraging cross-team collaboration between the pharmacy department and other departments in the organization is a key strategy to ensure that the strategic decisions taken reflect the needs and goals of the organization as a whole (Maika, 2023). The first step is to build a strong understanding of the organization's goals and vision among all departments involved. This can be achieved through open and ongoing communication from senior management about the strategic direction and priorities of the organization. Furthermore, it is important to create opportunities for cross-team collaboration, whether through regular meetings, discussion forums, or joint projects involving multiple departments (Heidenrich, 2007). In the pharmaceutical context, collaboration between the pharmaceutical department and the finance department can help ensure that drug procurement decisions and pharmaceutical budget allocations reflect overall organizational priorities (Haq, 2022). On the other hand, collaboration with the marketing department can help in developing promotional and communication strategies that support organizational goals and patient needs. Additionally, collaboration with clinical operations departments allows pharmacy departments to better understand patient needs and ensure that pharmacy services are adapted to current clinical practices (Mendonca, 2021). It is also important to create a work culture that supports cross-team collaboration, where rewards are given to cooperation and individual contributions to team success. Through effective cross-team collaboration, the pharmacy department can ensure that the strategic decisions taken are aligned with the needs and goals of the organization as a whole, optimizing the performance of the pharmacy department and its contribution to the overall success of the organization.

Employee Skills Development

Training and developing employee skills in terms of the use of data analysis tools, pharmaceutical policies, and results-oriented management strategies is an important investment for pharmaceutical departments to improve service quality and operational efficiency (Zaqeeba, 2023). The first step is to identify employee training needs based on existing skills gaps. This can be done through performance evaluations, feedback from staff, or analysis of departmental needs. Once training needs are identified, appropriate training programs must be designed to meet those needs (Yuniningsih, 2023). This training should include the use of data analysis tools such as statistical software, data processing platforms, and advanced data analysis techniques such as predictive analysis. In addition, training on pharmaceutical policies, including regulations and data security standards, as well as best practices in drug management and clinical pharmacy, is also important to improve staff understanding and compliance with relevant guidelines.

Furthermore, training in results-oriented management strategies can assist employees in understanding how their actions contribute to achieving the overall goals and vision of the pharmacy department (Winarto, 2023). It is also important to provide additional supporting resources, such as reading materials, seminars, or access to online courses, to facilitate independent learning and ongoing skill development (Bae, 2017). Lastly, regular evaluation of training effectiveness should be conducted to ensure that training programs provide significant added value to employees and the pharmacy department as a whole (Shah, 2023). With the right investment in employee training and skills development, pharmacy departments can ensure that their staff is equipped with the skills and knowledge necessary to face the complex challenges of modern pharmacy management and achieve optimal results.

Innovation in Service

Driving innovation in pharmaceutical services, such as the development of new clinical services, disease management programs, or efficient drug delivery models, requires a deep understanding of patient needs and relevant market trends (Rusly, 2016). The first step is to conduct a thorough analysis of patient needs and preferences, as well as trends and developments in the pharmaceutical industry. This can include evaluation of patient data, feedback from patients already served, and market research about market demands that may not be met (Anderson, 2009). Furthermore, it is necessary to carry out cross-functional collaboration between the pharmaceutical team, marketing team, and product management team to identify innovation opportunities that suit market needs and the organization's business strategy (Ruth H. Phelps, 1984). This enables the development of holistic and integrated action plans to develop new services or improve existing services. Additionally, it is important to involve key stakeholders, including patients, healthcare providers, and regulatory authorities, in the innovation development process (Nagel, 2017). Feedback from these stakeholders can provide valuable insight into their needs and expectations, as well as help validate innovative ideas before they are launched into the market.

After an innovation is developed, it is important to conduct a small trial or evaluation of the new service before it is widely implemented (Ruth H. Phelps, 1984). This makes it possible to identify potential successes, possible issues and opportunities for improvement before full launch. Finally, it is important to adopt an open approach to continuous learning and iteration, where innovations are continuously developed and refined based on user feedback and operational experience (Safitriawati, 2022). By driving innovation in pharmacy services based on a deep understanding of patient needs and market trends, pharmacy departments can increase their added value, increase patient satisfaction, and produce better outcomes overall.

Analyzing complex pharmaceutical data to identify market trends, patient needs, and new service development opportunities requires a structured and focused approach (Schell, 2014). One of the best methods is to use descriptive and inferential statistical analysis to explore patterns and relationships in pharmaceutical data. This analysis can involve the use of techniques such as regression, analysis of variance, or cluster analysis to identify correlations between different variables and reveal trends that may not be immediately apparent (Shah, 2023). Additionally, advanced data analysis techniques such as time series analysis or factor analysis can be used to predict future patterns based on historical data and identify factors influencing changes in market trends or patient needs.

In addition, artificial intelligence and machine learning technologies can be used to analyze large and complex pharmaceutical data quickly and efficiently, as well as to identify complex patterns that may not be detected by conventional analysis methods (McDowell, 2009). Lastly, it is important to involve pharmaceutical practitioners and other domain experts in the data analysis process, as they have a deep understanding of the clinical and operational context in which pharmaceutical data is used, and can provide valuable insight into the practical implications of the analysis findings (Syahrir, 2020). By combining these methods in pharmacy data analysis, pharmacy departments can identify relevant market trends, better understand patient needs, and identify new service development opportunities that have the potential to improve the quality of patient care and overall pharmacy outcomes.

Regulatory Oversight

Increasing understanding of relevant regulations and policies in the pharmaceutical industry as well as ensuring full compliance with applicable standards and requirements is a crucial aspect in maintaining legal and sustainable pharmaceutical department operations (Liebowitz, 2006). The initial step is to conduct a thorough audit of relevant regulations and policies, whether issued by health regulatory agencies, governments, or other regulatory organizations (McDowell, 2009). These audits should include an in-depth understanding of regulations regarding the production, storage, distribution and use of medicines, as well as compliance with regulations regarding patient privacy and data security. Furthermore, the pharmacy department needs to ensure that its staff is continuously provided with the necessary training and understanding of relevant regulations and policies. This may include regular training sessions, reading materials, or self-paced training via online platforms (Kodama, 2020). Additionally, pharmacy departments must establish clear standard operating procedures that are adhered to by all staff to ensure that compliance with regulations and policies occurs consistently. Implementation of an effective reporting and monitoring system is also needed to identify and resolve regulatory violations quickly and in a timely manner (Prawiades, 2015). Additionally, building good relationships with health regulatory agencies and regulatory authorities can help in understanding new regulatory changes and ensure that the pharmacy department remains in full compliance. Finally, it is important to adopt a proactive attitude toward compliance, prioritizing patient integrity and safety above all else (Plummer, 2017). By taking these steps, pharmacy departments can ensure that they are operating according to the highest standards of compliance and keep stakeholder trust and the organization's reputation well maintained.

Research and development

Investment in research and development to develop innovative solutions in pharmaceutical management is an important step in increasing the efficiency and effectiveness of pharmaceutical services (Pristiyono, 2023). The initial step is to conduct market research and analyze patient needs and the challenges faced by the pharmacy department. From here, identify areas where new technology can be applied to improve pharmacy management processes, such as patient monitoring or medication inventory management. Furthermore, cross-functional collaboration is needed between the pharmacy team, information technology team, and other experts to design and develop innovative solutions that suit the needs and goals of the pharmacy department (Kanagaraj, 2022). For example, the use of technologies such as the Internet of Things (IoT) or smart sensors can enable real-time patient monitoring and faster decision making in response to changes in the patient's condition. In addition, the use of an automated drug inventory management system with artificial intelligence can help optimize drug stocks, reduce waste, and increase inventory management efficiency.

During the development of innovative solutions, it is important to consider data security factors and compliance with patient privacy regulations, such as HIPAA, as well as ensuring that the solutions developed comply with applicable ethical and legal standards (Gonawan, 2022). Once an innovative solution is developed, it is important to conduct careful trials or evaluations to validate its performance and effectiveness before widespread implementation. Finally, a commitment to continuous learning and improvement in the development of innovative solutions is needed to ensure that pharmacy departments continue to adopt the latest technology and improve their services according to developments (Haeria,

2017). By investing time and resources in research and development of innovative solutions, pharmacy departments can take steps toward a future that is more efficient, effective, and responsive to patient needs.

Improving employee data analysis skills in the pharmacy department requires a holistic and structured approach. First, it is important to assess the level of data analysis skills possessed by current employees through evaluating their skills and knowledge in statistical analysis, data processing, and use of data analysis software (Haines, 2023). This step can be done through surveys, interviews, or relevant skills tests. After assessing needs, the next step is to provide appropriate training and development to improve employee data analysis skills. This training can include courses or workshops on statistics, programming, and data analysis software such as Python, R, or SPSS (Ahmad, 2023). Additionally, the use of case studies and practical projects relevant to the pharmaceutical context can help employees practice their data analysis skills in real situations. Furthermore, it is important to provide employees with access to supporting resources, such as books, articles, and online tutorials, that can help them improve their understanding and skills in data analysis (Ali, 2022). Additionally, supporting collaboration between employees in completing data analysis projects can also improve mutual learning and knowledge exchange between individuals. Lastly, it is important to encourage and provide support for employees who wish to engage in certification programs or continuing education programs in data analysis, so that they can develop their skills to an advanced level (Haeria, 2017). By implementing this strategy, pharmacy departments can improve employee data analysis skills, which in turn will improve the department's ability to use data effectively in strategic and operational decision making.

Limitations of Strategic Intelligence Tools

Although strategic intelligence is an invaluable tool in improving the performance and effectiveness of pharmacy departments, there are several limitations that need to be considered regarding the use of these tools. First, limited data is the main problem faced by the pharmacy department in implementing strategic intelligence (Haq, 2022). Pharmaceutical data is often spread across disparate systems, and can be incomplete or inaccurate. These limitations can hinder the pharmacy department's ability to generate accurate and comprehensive insights. In addition, data security and privacy issues are also important concerns in the use of strategic intelligence tools. Pharmacy departments often have access to sensitive patient data, and protecting this data from security threats and misuse is a top priority (Handayany, 2022). Therefore, strategic intelligence tools must comply with strict data security standards and follow applicable privacy regulations. Furthermore, complex data interpretation and in-depth analysis often require specialized skills in data analysis. Pharmacy employees may require additional training to properly understand and interpret data, and apply the resulting insights into effective decision making.

Not to forget, cost is another factor that must be considered. Implementation and use of strategic intelligence tools can require large investments in technology infrastructure, software, and employee training. For some pharmacy departments, these costs may be a barrier to full adoption of these tools. Finally, it is important to remember that strategic intelligence tools are only a means to support decision making, not a replacement for human judgment. The final decision must still be based on experience, knowledge, and careful human judgment (Duggan, 2020). Therefore, pharmaceutical employees must understand the limitations of strategic intelligence tools and use the resulting information wisely in the context of the decisions taken. By recognizing and understanding these limitations, pharmacy departments can take appropriate steps to maximize the benefits of using strategic intelligence tools while mitigating the associated risks and obstacles.

Evaluating the effectiveness of risk management strategies in the context of strategic intelligence in the pharmacy department requires a structured and holistic approach (Chertoff, 2020). First, the initial step is to set clear goals and performance indicators for the risk management strategy that has been implemented. These objectives should be related to protecting against identified risks and achieving success in achieving the pharmacy department's strategic objectives. Next, it is necessary to carry out a thorough evaluation of the risks that have been identified and their mitigation strategies. This involves assessing the success in identifying, measuring and managing the risks faced by the pharmacy department, as well as the effectiveness of the actions taken to reduce their impact (Erisma, 2021).

Strategic Intelligence in Drug Delivery

Strategic Intelligence for drug delivery involves the systematic collection, analysis, and utilization of relevant information to improve efficiency, effectiveness, and innovation in the delivery of pharmaceutical products to patients. It encompasses a wide range of activities and considerations aimed at optimizing the processes involved in drug delivery, from manufacturing to distribution and administration (Campbell, 2020). At the heart of strategic intelligence for drug delivery is the utilization of data-based insights to guide decision making and strategy development. This includes collecting data on patient demographics, medication adherence, treatment outcomes, and supply chain logistics (Abbas, 2018). By analyzing this data, pharmacy departments can identify patterns, trends, and potential areas for improvement in medication delivery practices. One of the key aspects of strategic intelligence for drug delivery is optimizing inventory management and supply chain logistics. By utilizing data analysis and predictive modeling, pharmaceutical departments can better forecast demand, optimize inventory levels, and simplify distribution channels (Francisco J. Cantu, 2006). This can help reduce inventory shortages, minimize waste, and ensure that medications are available when and where they are needed. Another important component is improving medication adherence and patient engagement. Strategic intelligence can help pharmacy departments identify patients at risk of nonadherence and develop targeted interventions to improve adherence. This can include personalized medication management plans, educational resources, and communication strategies tailored to the patient's specific needs. In addition, strategic intelligence can drive innovation in drug delivery technology and methodology.

Strategic intelligence related to solving sustainable strategic challenges at the national or corporate level. It operates through three core components: intelligence gathering, strategic vision, and visionary leadership. The primary recipients are senior policy makers in organizations who are adaptable and able to exert strategic influence within their scope of operations. Recent or ongoing examples of comprehensive strategic intelligence efforts include assessments of Crimea, Syria, and Iran, as well as analyzes of the mortgage and Euro crises. These cases require a deep understanding of the situational dynamics, historical dependencies, and diverse motivations, priorities, and capabilities involved. Furthermore, they need insight into asymmetric, disruptive, and emerging elements, including developments that may be unexpected. Additionally, they require exploration of alternative scenarios, strategies, and crisis management approaches. Collectively, these insights constitute important information that must be conveyed to policymakers.

Figure 3. Strategic intelligence triangle (Source: (Tuomo, 2014))



Compliance with relevant regulations and policies in the collection, storage and analysis of pharmaceutical data has very important implications in the context of strategic intelligence (Abbas, 2018). First of all, it is important to understand and comply with applicable data privacy regulations, such as the Health Insurance Portability and Accountability Act (HIPAA) in the United States or the General Data Protection Regulation (GDPR) in the European Union. Compliance with these regulations ensures that patient data and other sensitive information is kept confidential, prevents unauthorized access, and ensures that pharmaceutical data is used ethically and legally. Furthermore, compliance with data security standards and information security principles helps protect pharmaceutical data from cyber threats and information leaks, which can result in financial losses and reputational damage for

pharmaceutical departments (Ali, 2022). In addition, it is important to comply with regulations relating to the collection and storage of regulatory pharmaceutical data, such as regulations issued by the Food and Drug Administration (FDA) in the United States. Compliance with these regulations ensures that the pharmaceutical data collected and stored meets established standards for validity, integrity and timeliness, making it reliable for strategic analysis and decision making (Calvin, 2021). Additionally, compliance with an organization's internal policies, such as a data use policy or information systems use policy, helps ensure that all pharmacy department employees understand their responsibilities in properly managing and using data. By understanding and complying with relevant regulations and policies, pharmacy departments can ensure that the collection, storage, and analysis of pharmacy data for strategic intelligence is carried out safely, ethically, and effectively, thereby providing maximum benefit to the department and the patients served.

Pharmaceutical Challenges in Strategic Intelligence

Current pharmaceutical challenges cover various aspects, ranging from changes in regulations and policies, to increasing production costs and increasingly fierce market competition (Chebotareva, 2021). In facing this challenge, strategic intelligence plays a key role in helping pharmacy departments identify, analyze and respond to the dynamics that occur in the pharmaceutical environment. One of the main challenges in the pharmaceutical industry is the constant change in regulations and policies. The government frequently issues new regulations related to requirements for the production, distribution, and sale of medicines that affect the way pharmacy departments operate (Campbell, 2020). In facing these changes, strategic intelligence enables pharmaceutical departments to monitor and understand regulatory changes that occur, as well as identify possible implications and opportunities for their operations. Apart from that, production costs and increasingly tight market competition are also challenges for the pharmaceutical department. Raw material prices, labor costs and product development costs tend to increase over time, while competition from other pharmaceutical companies is also intensifying (Arifin, 2020). In facing this challenge, strategic intelligence can assist the pharmaceutical department in analyzing cost and price trends, as well as identifying appropriate strategies to control production costs and increase the competitiveness of the department's products.

Changes in consumer preferences and needs are also an important challenge in the pharmaceutical industry. Patients are increasingly demanding more personalized and innovative services, while expectations for product quality and safety are also increasing (Ardiansyah, 2022). In facing these challenges, strategic intelligence enables pharmaceutical departments to understand emerging consumer trends and preferences, and develop products and services that suit market needs. In addition, challenges in risk management are also a major concern for pharmacy departments. Risks related to product safety, regulations, and company reputation can have a significant impact on the performance and survival of pharmaceutical departments (Ali, 2022). In managing this risk, strategic intelligence enables the pharmacy department to identify and evaluate existing risks, as well as develop effective mitigation strategies to reduce their impact. Overall, strategic intelligence has a crucial role in helping the pharmaceutical department face the various challenges that exist in the pharmaceutical industry today (Arifin, 2020). By leveraging intelligent data and analytics, pharmacy departments can plan effective strategies, make informed decisions, and face challenges with confidence and resilience.

Identifying and exploiting innovation opportunities in pharmaceutical services based on strategic intelligence collected and analyzed involves a series of systematic and focused steps (Artha, 2022). First of all, it is important to conduct in-depth analysis of strategic intelligence data collected from various sources, including operational data, patient data, and market trend data. This process involves the use of data analysis techniques such as descriptive statistics, predictive analysis, and geospatial analysis to identify patterns, trends, and anomalies that may indicate opportunities for innovation in pharmaceutical services (Agustianingsih, 2022) (Bader, 2018). Next, consider trends and developments in the pharmaceutical industry broadly, as well as evolution in clinical practice and patient needs, to identify areas where innovation can provide significant benefits (Bae, 2017). Cross-functional collaboration between the pharmacy department and other departments within the organization can also assist in identifying innovation opportunities related to the integration of new technologies, the development of innovative service delivery models, or the implementation of best practices in clinical pharmacy. Additionally, it is important to involve key stakeholders, including

patients, healthcare providers and regulatory authorities, in the process of identifying and assessing innovation opportunities, thereby ensuring that proposed innovations truly meet needs and provide real added value (Agustianingsih, 2022). Lastly, utilizing effective communication and marketing strategies to introduce and introduce innovations to relevant stakeholders, as well as ensuring widespread and successful adoption of these innovations (Adi, 2023). By following these steps, pharmacy departments can identify and capitalize on innovation opportunities related to their strategic intelligence, enabling them to significantly improve service quality, operational efficiency, and patient satisfaction.

Table 1. Commonly used strategic intelligence models in the grammatical department

Strategic Intelligence Model	Description	Superiority	Constraint
SWOT analysis	A model that analyzes the strengths, weaknesses, opportunities and threats of an organization or product.	Helps identify internal and external factors that influence organizational performance. Enables strategic planning based on a better understanding of the business environment.	Requires comprehensive and accurate data collection. Does not give priority or weight to each factor analyzed.
PESTEL Analysis	A model that analyzes political, economic, social, technological, environmental and legal factors.	Enables a thorough understanding of the external environment affecting the pharmaceutical industry. Helps identify opportunities and risks arising from changes in the external environment.	Requires in-depth analysis and constant monitoring of changes in the external environment. Does not give priority or weight to each factor analyzed.
Porter's Five Forces Analysis	A model that analyzes the strength of competition in an industry, namely the negotiating power of buyers, the negotiating power of suppliers, the threat of substitute products, the threat of new products, and the level of rivalry between competitors.	Helps understand the dynamics of competition in the pharmaceutical industry. Identify factors that can influence company profitability.	Requires accurate data and information about competitors. Does not consider external factors such as government regulations or technological changes.
Benchmarking Analysis	A model that compares the performance of an organization or business process with competitors or industry standards.	Enables identification of areas for improvement based on benchmarking against best competitors. Drive innovation and continuous improvement.	Requires access to data and information about competitor performance. It is not always possible to identify differences between specific conditions that may affect performance.

Source: (Chertoff, 2020)

Table 2.Popular strategic intelligence model tools used for drug delivery

Strategic Intelligence Tools/Models	Description	Superiority	Constraint
Bioinformatics Analysis	The use of computing and statistical analysis to understand and utilize biological data, such as genome sequences and protein structures, in the drug discovery process.	Enables a deep understanding of biological structure and function, which can be used to identify potential drug targets.	Requires specialized knowledge and skills in bioinformatics and computational analysis. Requires access to relevant and up-to-date biological data.
Quantitative Pharmacological Analysis	Mathematical and statistical models are used to predict the effects of drugs based on their physical, chemical, and biological properties, as well as dynamics within the human body.	Enables modeling and simulation of drug effects at molecular and systemic levels. Assists in prioritizing drug candidates that have high therapeutic potential.	Requires accurate and detailed data on the physical, chemical and biological properties of drugs. Requires expertise in mathematical modeling and statistical analysis.
Activity Structure Analysis	Methods that use information about the molecular structure of a compound to predict its biological activity, such as affinity for a drug target or potential toxicity.	Enables the identification and optimization of drug candidate compounds with desired biological properties. Helps in understanding the relationship between molecular structure and biological activity.	Requires access to adequate software and databases for molecular structure analysis. It is not always possible to accurately predict the biological effects of a compound based on its structure.
Clinical Data Analysis	Use of clinical data from clinical trials and medical records to identify patterns, trends, and associations that can be used to guide drug development and safety evaluation.	Enables real-time evaluation of drug effectiveness and safety during development and post-marketing. Helps in identifying new indications and treatable patient subpopulations.	Requires large and diversified clinical data for valid and accurate analysis. A deep understanding of clinical trial methodology and clinical research ethics is required.

Source: (Duggan, 2020)

Table 3. List of commonly explored strategic intelligence models in pharmaceutical department

Strategic Intelligence Model	Description	Superiority	Constraint
Market Analysis	Models that analyze market trends, consumer needs, and perceptions of pharmaceutical products to assist in the development of marketing and pricing strategies.	Enables deep understanding of market demand and consumer preferences.	Requires comprehensive and accurate market data. Careful analysis is required to understand market trends and dynamics.

		Helps in identifying unmet market opportunities.	
Risk Analysis	Models that identify and evaluate risks associated with pharmaceutical product development, including clinical, regulatory, and market risks.	Assist in identifying and managing risks that may affect the success of product development. Minimizes the risk of failure in clinical trials or product marketing.	Requires a deep understanding of pharmaceutical product regulations and safety. Continuous risk assessment is required as product development progresses.
Competitive Analysis	A model that analyzes competitors' positions in the market and their strategies, and identifies the relative strengths and weaknesses of pharmaceutical products under development.	Enables a deep understanding of competition in the market and potential threats from competitors. Helps in identifying the competitive advantages of products being developed.	Requires access to relevant information about competitors. Careful analysis is required to understand competitors' strategies and tactics.
Patient Needs Analysis	Models that analyze patient needs, preferences and expectations for pharmaceutical products, and identify opportunities for innovation in service and product development.	Enables the development of products that better suit patient needs and preferences. Assists in identifying innovation opportunities relevant to patient needs.	Requires a deep understanding of the patient's demographic and social characteristics. Market research and qualitative analysis are needed to best understand patient needs.

Source: (Ahmad, 2023)

Futuristic Overview

In the future vision, the role of strategic intelligence in the pharmaceutical department will become increasingly crucial in anticipating and responding to ever-changing dynamics in the health industry (Abbas, 2018). First of all, technology will be one of the main drivers of transformation in pharmaceutical management. The use of artificial intelligence, big data analysis, and blockchain technology will become standards in patient data management, drug inventory, and the development of innovative pharmaceutical services. An automated pharmaceutical information system will enable faster and more precise decision making, as well as more efficient risk management. Additionally, developments in telemedicine and digital health will open new opportunities in the remote provision of pharmaceutical services and real-time patient monitoring.

In this case, the pharmacy department will function as an information and coordination center that connects patients with health service providers and the necessary technology. Furthermore, cross-sector collaboration will be key in optimizing the use of data and resources to improve pharmaceutical services. The pharmacy department will work with technology companies, research institutes and healthcare institutions to develop innovative solutions that cover all aspects of pharmacy management, from diagnosis to treatment and patient monitoring. This collaboration will enable a wider exchange of knowledge and resources, as well as accelerate the birth of solutions that have a big impact on improving people's health and welfare. Additionally, it is important to recognize that the role of pharmaceutical departments will evolve to become more proactive in influencing health policy and industry regulation. By utilizing strategic intelligence, the pharmaceutical department will be able to identify important trends and issues in the health industry, as well as provide valuable input to policy makers to ensure sustainable regulatory development and support innovation in pharmaceutical management (Abdulrahman, 2015). In this case, the pharmacy department will be an agent of change that plays an active role in shaping the future of global health. Overall, the future vision of strategic intelligence in pharmacy departments is to bring about significant positive change in the way we understand, manage, and deliver healthcare. By leveraging advanced technology, cross-sector collaboration, and influence

in policymaking, pharmacy departments will be at the forefront of leading a sustainable, patient-centric healthcare revolution.

Therefore, while strategic intelligence remains a priority within pharmaceutical departments, it is important to understand that there is no magic solution or single platform that can solve all problems. In contrast, a more realistic approach may involve a combination of strategies, technologies, and best practices tailored to the specific needs and challenges of the pharmacy department. It is also important to understand that the search for the "holy grail" is not the final destination, but part of an ongoing journey in improving performance and providing better services to patients (Adi, 2023). Thus, pharmacy departments must remain realistic in their expectations, open to variations in solutions, and ready to engage in a continuous process of learning and adapting.

CONCLUSION

From the various explanations above, it can be concluded that Strategic Intelligence plays a crucial role in improving the performance and effectiveness of the pharmacy department in hospitals. Although pharmacies have the potential to be a significant revenue generating unit, problems such as excess inventory, expired drugs, long waiting times, and drug stock shortages can hamper a pharma's ability to reach its full potential.

By applying a strategic intelligence approach, pharmacy departments can overcome these challenges by collecting, analyzing, and interpreting relevant data. This makes it possible to identify drug demand patterns, inventory trends, and causes of stock shortages, as well as develop appropriate strategies to optimize inventory, improve the efficiency of the drug delivery process to patients, and manage drug supplies more effectively.

Thus, the application of strategic intelligence can help hospital pharmacy to become more efficient, effective and sustainable in the long term. This not only increases patient satisfaction, but also supports the creation of a more productive and highly competitive work environment in the ever-growing pharmaceutical industry. Therefore, investing in developing strategic intelligence capabilities is an important step for pharmacy departments to achieve strategic goals and become leaders in providing quality health services.

The government can provide financial support and resources to improve training in strategic intelligence for workers in pharmaceutical departments. This can be done through subsidized training programs or scholarships for pharmaceutical workers who want to improve their skills in analyzing data and making strategic decisions. The government can design policies that encourage the use of information technology and integrated information systems in pharmacy departments. This can help improve data management, inventory monitoring, and overall operational efficiency.

Pharmaceutical workers can improve their skills in data analysis through available training and courses. Mastering data analysis tools such as Microsoft Excel, SQL, or other data analysis software can help make more informed decisions. It is important to collaborate with other teams in the hospital or healthcare organization to make the most of available knowledge and resources. Cross-team collaboration can help improve understanding of patient conditions, market trends, and overall community health needs.

Agencies related to the pharmaceutical industry, such as drug suppliers, medical equipment manufacturers, and research institutions, can encourage partnerships and collaboration with pharmaceutical departments. This can help in the exchange of information, product innovation, and the development of more effective solutions to problems faced by the pharmaceutical industry. It is important for relevant agencies to provide financial support for research and development of innovation in pharmaceutical management. Investments in research and development can produce new solutions and improve operational efficiency across the industry.

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