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The Role of Management Information Systems in Supporting Business Innovation and Strategy

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ABSTRACT

This study investigates the integration of Natural Language Processing into Management Information Systems and its contribution to business innovation, marketing responsiveness, and strategic decision-making. The exponential growth of unstructured data from social media, financial reports, and customer feedback requires firms to adopt intelligent tools beyond traditional MIS. By incorporating NLP, organizations convert raw textual data into strategic insights for competitor analysis, supplier risk assessment, misinformation detection, and contextual business intelligence. This research aims to explore how NLP-enabled MIS improves supply chain resilience, facilitates data-driven strategies, and enhances overall organizational performance. A qualitative literature review was conducted by synthesizing peer-reviewed journals, conference proceedings, and industry reports published between 2020 and 2025. The results show that NLP strengthens sentiment analysis, named entity recognition, and automated summarization, enabling managers to react quickly to market dynamics and safeguard corporate reputation. Nevertheless, major challenges persist, including system incompatibility, high implementation costs, limited digital literacy, and cybersecurity risks. Success factors rely strongly on top management support, effective communication, quality assurance, and employee readiness. The study concludes that the NLP-MIS synergy represents a strategic resource for achieving sustainable competitive advantage when properly aligned with organizational objectives and human capital development.

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Penelitian ini mengkaji integrasi Pemrosesan Bahasa Alami (NLP) ke dalam Sistem Informasi Manajemen (SIM) serta kontribusinya terhadap inovasi bisnis, responsivitas pemasaran, dan pengambilan keputusan strategis. Pertumbuhan eksponensial data tidak terstruktur dari media sosial, laporan keuangan, dan umpan balik pelanggan mengharuskan perusahaan untuk mengadopsi alat cerdas yang melampaui SIM tradisional. Dengan mengintegrasikan NLP, organisasi mengubah data teks mentah menjadi wawasan strategis

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untuk analisis pesaing, penilaian risiko pemasok, deteksi disinformasi, dan intelijen bisnis kontekstual. Penelitian ini bertujuan untuk mengeksplorasi bagaimana MIS yang didukung NLP meningkatkan ketahanan rantai pasokan, memfasilitasi strategi berbasis data, dan meningkatkan kinerja organisasi secara keseluruhan. Tinjauan literatur kualitatif dilakukan dengan mensintesis jurnal yang ditinjau sejawat, prosiding konferensi, dan laporan industri yang diterbitkan antara tahun 2020 dan 2025. Hasilnya menunjukkan bahwa NLP memperkuat analisis sentimen, pengenalan entitas bernama, dan ringkasan otomatis, sehingga memungkinkan manajer untuk bereaksi dengan cepat terhadap dinamika pasar dan menjaga reputasi perusahaan. Meskipun demikian, tantangan besar tetap ada, termasuk ketidakcocokan sistem, biaya implementasi yang tinggi, literasi digital yang terbatas, dan risiko keamanan siber. Faktor-faktor keberhasilan sangat bergantung pada dukungan manajemen puncak, komunikasi yang efektif, jaminan kualitas, dan kesiapan karyawan. Studi ini menyimpulkan bahwa sinergi antara NLP dan MIS merupakan sumber daya strategis untuk mencapai keunggulan kompetitif yang berkelanjutan, asalkan selaras dengan tujuan organisasi dan pengembangan sumber daya manusia.

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INTRODUCTION

Transformation has pushed organizations to deal with massive volumes of unstructured data originating from business transactions, social media, customer reviews, and online news. Traditional Management Information Systems often struggle to process this type of data because they were designed for structured, numeric inputs. As a result, valuable insights hidden in textual information remain underutilized, limiting a firm's ability to respond to market changes. Natural Language Processing emerges as a key solution to bridge this gap by enabling systems to understand, interpret, and extract meaning from human language. Integrating NLP into MIS allows companies to automate competitor profiling, monitor supplier risks, detect misinformation, and enrich Business Intelligence with contextual insights. However, the adoption of NLP-based MIS faces several barriers, such as legacy system incompatibility, high investment costs, lack of digital skills, and growing cybersecurity concerns. Therefore, understanding how NLP strengthens MIS and what factors determine its success is critical for organizations seeking to maintain competitiveness in the data-driven era. This study aims to explore the strategic role, benefits, challenges, and critical success factors of NLP integration in MIS through a comprehensive literature review.

METHOD

This research applied a qualitative approach using a literature review to examine the role of NLP integration within Management Information Systems. Secondary data were collected from reputable journals, conference papers, industry reports, and academic books published from 2020 to 2025. Literature selection was conducted purposively based on

relevance to MIS, NLP, business innovation, and organizational performance. The analysis stage employed content analysis to identify key themes, conceptual relationships, and research gaps. Source triangulation was used to validate findings and ensure a more objective and comprehensive interpretation. The study focused on six dimensions: competitor profiling, supplier relationship management, misinformation detection, competitive analysis, contextual term identification, and BI enhancement. All synthesized results were then structured into a conceptual framework covering supporting factors, implementation challenges, and the impact of NLP-based MIS.

RESULT AND DISCUSSION

1. The role of information management systems in business innovation

The development of digital technology has caused the growth of data in companies to increase very rapidly. This data comes from business transactions, social media platforms, emails, customer reports, online news and various other sources. Much of this data is unstructured, making it difficult to analyze using common methods. In this situation, NLP becomes a vital solution because it has the ability to understand and process human language into useful information. By unifying NLP in Management Information Systems (MIS), companies can gain a better understanding of customers.

a. Improve Marketing Campaigns through Competitor Profiling

The use of Natural Language Processing (NLP) in information management allows companies to conduct in-depth studies of competitors' marketing activities by utilizing various written data sources such as news, articles, blogs and social media platforms. With techniques such as sentiment analysis, companies can find out how people view the products or services offered by competitors, so they can identify their strengths and weaknesses. In addition, the application of topic modeling helps companies in discovering themes or issues raised in competitors' campaigns, while the recognition of named entities also makes it possible to identify important elements such as the name of the new product, the marketing area, or the public figures involved in the promotion. With this insight, companies can design marketing strategies that are more flexible, relevant and competitive, and able to fill market areas that have not been well utilized by competitors.

b. Improve Supplier Relationship Management

In managing relationships with suppliers, NLP has a vital function in analyzing and processing information from various external sources such as reports in the industrial sector, economic news, and interactions on social media. With the ability to extract information, the system can automatically identify important indicators related to supplier performance, including financial condition, operational stability, as well as risks that may occur in the future. Sentiment analysis can also be applied to evaluate a supplier's reputation based on public opinion or reviews from other parties. In this way, companies can get a more complete and up-to-date picture of their suppliers, which supports more informed decisions when selecting, retaining or changing business partners. This directly increases supply chain efficiency and resilience.

c. Detecting Misinformation

NLP also has an important role in detecting and dealing with misinformation that could harm a company's reputation. Through text classification techniques and linguistic pattern analysis, the system can recognize content that contains inaccurate, misleading, or potentially dangerous information. In addition, comparison-based methods with reliable sources allow the

system to automatically verify facts. With this capability, companies can quickly respond to the spread of false information, either by providing official clarification or taking appropriate communication steps. Speed in detecting and dealing with misinformation is very important to maintain public trust and protect brand image amidst the very fast pace of digital information.

d. Business Competition Analysis In business competitive analysis

NLP allows companies to draw important information from lengthy documents such as annual reports, financial reports, and industry publications. With automatic summary techniques, companies can obtain core information without having to read the entire document manually. In addition, trend analysis and keyword extraction contribute to identifying competitors' business strategy directions, including investment focus, market expansion and product innovation. By understanding these dynamics, a company can evaluate its position in the market and formulate more effective strategies to increase its competitiveness. This approach also helps in predicting market changes and responding to them quickly

e. Identifying Contextual

Terms NLP's ability to analyze the meaning relationships between words allows companies to find important terms that are relevant in a business field. Through methods such as word representation and evaluating similarity of meaning, the system is able to group words that have similar or related meanings. For example, the term “renewable energy” can be linked to other terms such as “green energy,” “clean energy,” and “sustainable energy.” This understanding is crucial in developing a more holistic business taxonomy and ontology, making it easier to search for information, data integration and analysis from various sources. In this way, companies can gain deeper and more contextual insight into the decision-making process.

f. Improving Business Intelligence (BI)

Systems The application of NLP in Business Intelligence (BI) systems provides significant benefits by enabling the analysis of unstructured data, such as text from emails, narrative reports, customer reviews and conversation transcripts. Previously, conventional BI systems focused more on structured data in the form of numbers, so they often ignored important information hidden in text. With the use of techniques such as text mining, entity extraction, and sentiment analysis, BI systems can provide deeper and more comprehensive insights. The information obtained is not only quantitative, but also qualitative and contextual. This enables management to make more accurate, faster, and more comprehensive data-based decisions, thereby increasing the effectiveness of overall business strategy.

2. The Role of Management Information Systems in Business Strategy

Management information systems (MIS) have evolved to play an increasingly strategic role in helping organizations navigate the dynamics of business competition. MIS have become a source of competitive advantage by providing accurate, relevant, and timely information to support strategic decision-making.

Akhtar et al. 2020 in the International Journal of Production Economics states that the combination of big data technology and management information systems (MIS) is crucial for improving the quality of decision-making, particularly regarding supply chain management. With MIS, businesses can collect, process, and analyze massive amounts of data to gain strategic insights such as market behavior, supplier performance, logistics, and customer transactions. This information can be used to improve operational efficiency and make the business more resilient to market changes. MIS is a system that integrates and presents analysis results in the form of data that is easy to understand and accessible to managers. A Management

Information System (MIS) is a system that integrates and presents analytical results in the form of data that is easy for managers to understand and access. Research also emphasizes that the integration of MIS and big data enhances a company's responsiveness to market changes. Companies must be able to respond to shifts in demand, supply disruptions, and price fluctuations in a dynamic business environment. With the help of big data, MIS enables more adaptive, evidence-based decision-making, resulting in more targeted strategies. The quality of decision-making mediates the capabilities of big data and company performance. This means that the quality of decisions made through MIS is positively correlated with organizational performance, indicating increased efficiency and competitive advantage [1].

In addition, an MIS supports decision-making at various management levels, from the operational to the strategic. At the operational level, an MIS assists with routine decision-making related to daily activities. At the managerial level, an MIS is used for planning and performance monitoring, while at the strategic level, it plays a role in helping top management formulate long-term business policies and strategies.

Research conducted by Md. Monsur Ali found that MIS helps transform raw data into structured and easily understandable information, which helps managers analyze situations and make the best choices for decision-making. With MIS, the decision-making process becomes more rational and relies on data analysis rather than intuition. This enhances the objectivity and accuracy of the decisions made.

Additionally, MIS supports decision-making at various management levels, ranging from the operational to the strategic level. At the operational level, MIS aids in day-to-day decision-making related to daily activities. At the managerial level, MIS is used for planning and performance control. At the strategic level, MIS assists top management in formulating long-term business policies and strategies [2].

3. Supporting factors for the success of management information systems in business

A project manager must understand the real-life critical success factors (CSFs) that significantly influence project success. These CSFs should be identified at every stage of the project, starting from the Request for Proposal (RFP), initiation and planning, execution, monitoring and control, through to project closure. This knowledge serves as a practical guideline and reference base, enabling the project manager to manage the project effectively by concentrating on the most important factors at each phase. By recognizing the key CSFs, the project manager can anticipate potential obstacles and proactively develop appropriate strategies to address them and ensure project success.[3]

a) Critical success factor (CSF) is top management support. Strong support from senior leadership reflects their commitment to the project and builds confidence among the project team in carrying out their responsibilities. Top management must ensure that the well-being of the project team is safeguarded and that their concerns and feedback are properly acknowledged and addressed. This commitment is crucial for maintaining smooth project implementation and preventing negative situations, such as labor disputes or unproductive behavior, which can cause delays and additional complications. Therefore, both the project manager and top management should demonstrate the competencies emphasized in the Project Management Institute (PMI)'s Talent Triangle, particularly in people management, by applying an appropriate and effective leadership style.
b) Critical success factor (CSF) is the effective management of customer expectations. Handling customer expectations can be difficult, as clients may anticipate outcomes that do not fully align with the project's actual scope or deliverables. Therefore, it is crucial

to actively involve customers throughout the project by regularly updating them on progress, current status, and expected results to prevent misunderstandings or unexpected issues at project completion. Since customers have different characteristics and needs, the project manager must clearly identify the stakeholders and develop an appropriate engagement and communication strategy to manage expectations effectively.

c) Another critical success factor (CSF) is quality control. Quality plays a vital role in any project and is a core element of the project management triangle. To maintain high-quality deliverables, the project manager should develop a thorough quality management plan. This involves utilizing organizational knowledge assets, such as documented lessons learned and reviews from previous projects, as references for continuous improvement. By drawing on past experiences, the team can enhance current project performance and outcomes.The project manager should also propose and allocate reasonable appraisal costs, including inspections, testing, quality audits, equipment calibration, and supplier assessments, all of which contribute to improved project quality. Generally, investing in preventive measures is more cost-effective than relying on corrective actions. Preventive efforts not only reduce potential rework and delays but also help safeguard the organization's reputation by addressing possible issues before they arise.

d) Critical success factor (CSF) is project communication. Communication is a key knowledge area that every project manager must effectively master. According to the PMBOK, project managers spend approximately 80–90% of their time communicating throughout the project lifecycle. Strong communication skills are essential for leading the project team, both internally and externally. They also play a crucial role in resolving conflicts, promoting collaboration among stakeholders, and strengthening teamwork. A well-structured communication plan should be developed at the start of the project to ensure that relevant information is delivered to stakeholders in a timely manner.

e) The quality of the system has a positive effect on the success of (ISs) as the quality of the system focuses on the desired features in the system itself. These can be measured by easy to learn and use, completeness and flexibility[4]. Afterwards, the successful (ISs) helps in raising the quality of the organization and the total quality of the management through the participation of each employee in the responsibilities; the administrative designer, user and worker as significant parts in the success of the Management of Information Systems (MIS), since they relate to the daily activities of the organization [5]. The failure of the system does not mean broken down, but as not used in an efficient way. This can be referred to problems in the design, costs, data and operation. On the other hand, success means that (ISs) have high quality and achieves all objectives and requirements of the user by covering all work procedures that are required currently and, in the future, not to forget working in an appropriate technical way without mistakes and to be easily repaired and developed, provided that the total moral and material benefits of the system shall be equal or more that the total costs [6].

4. The Impact of Management Information System Implementation on Business Performance

The implementation of Management Information Systems (MIS) has a highly significant impact on improving business performance, both at the operational and strategic levels, as highlighted in various studies, including [7] on business intelligence systems and Chatzoglou & Diamantidis, (2009) on information system implementation risks. In this context, MIS is not merely a tool for processing data into information, but rather a strategic system that enhances the quality of managerial decision-making by providing relevant, accurate, and timely

information, enabling organizations to respond more effectively and efficiently to dynamic business environments. Systems such as business intelligence (BI) a key component of modern MIS allow organizations to leverage large volumes of data through technologies like data warehouses, data mining, and analytical processing, ultimately creating added value by improving both efficiency and effectiveness in business operations.

Furthermore, the impact of MIS implementation on business performance can be examined through two primary dimensions: business process performance and organizational performance, which are interrelated and form a complex causal relationship. At the business process level, MIS directly contributes to improving operational efficiency through process automation, cost reduction, productivity enhancement, and better coordination across organizational functions, leading to more structured, faster, and error-minimized processes. In addition, MIS enhances operational effectiveness by supporting various activities within the value chain such as logistics, production, marketing, and customer service thereby generating added value and improving customer satisfaction. These improvements at the process level are then accumulated and reflected in overall organizational performance, including increased profitability, sales growth, competitiveness, and the firm's ability to sustain competitive advantage in the marketplace.

However, the relationship between MIS implementation and business performance is not always linear or direct; rather, it is influenced by various contextual factors such as industry characteristics, organizational strategy, and the firm's capability to integrate information systems into its business processes. Elbashir et al., (2008) emphasize that the positive impact of MIS will be maximized when the system is implemented in alignment with managerial objectives and operational needs, supported by adequate technological infrastructure and competent human resources. Additionally, industry differences play a role in determining the strength of the relationship between business process performance and organizational performance, as each sector has distinct operational characteristics and information requirements, leading to varying degrees of MIS benefits [9].

On the other hand, MIS implementation is also associated with various risks that may affect business performance, as identified by Chatzoglou & Diamantidis, (2009), who highlight that information technology risks such as data integrity issues, system security vulnerabilities, management capability limitations, and system continuity problems can negatively impact coordination, information capability, and even organizational productivity if not properly managed. These risks may lead to poor decision-making, operational disruptions, and decreased trust in the system, ultimately hindering the achievement of optimal business performance. Therefore, organizations must manage MIS implementation comprehensively by considering technical, managerial, and organizational aspects, including continuous system evaluation and effective risk management practices to minimize potential negative impacts [10].

In conclusion, the implementation of Management Information Systems has a profound impact on enhancing business performance, particularly through improving the efficiency and effectiveness of business processes, which ultimately translates into better organizational performance. However, the success of MIS implementation largely depends on contextual factors and the organization's ability to manage risks and utilize technology effectively. Thus, MIS should be viewed not only as an operational tool but also as a strategic resource that provides sustainable competitive advantage in an increasingly complex and dynamic business environment [11].

The adoption of Managerial Information Systems (MIS) has been shown to have a positive impact on organisational results, especially in improving operational efficiency, the

quality of strategic decisions, and enterprise revenues. Research done by Mutoffar et al., (2024) indicates that improvements in MIS enable companies to use modern technologies like artificial intelligence, data analysis, and cloud infrastructure to produce more value, raise production, and react more quickly to market changes, therefore resulting in increased financial returns. Consistent with this viewpoint, Lipaj & Davidavičienė, (2013) explain that using integrated information systems, ERP for instance, may enhance company performance by maximizing internal operations, attaining cost-effectiveness, boosting output levels, and providing both tangible and intangible benefits like better collaboration and improved data accuracy. Furthermore, Alsalim, (2020) found that the application of information technology significantly influences creative management techniques, therefore enhancing organizational achievements by enhancing business processes, lowering hazards, and advancing service standards and customer satisfaction. Thus, it is fair to assume that the successful implementation of MIS depends on technology absorption, strong leadership support, and workforce readiness all elements that advance long lasting changes in corporate performance.

5. Challenges of Management Information Systems in the Business World

Management Information Systems (MIS) play a significant role in supporting decision-making processes, improving operational efficiency, and strengthening an organization's competitiveness. However, their implementation in the modern business world is not without various obstacles that can affect the success of their implementation.

a. Technological Challenges in ERP Implementation

One of the main obstacles in ERP implementation relates to technological limitations and the complexity of the system integration process. Many organizations still struggle to integrate legacy systems with newer, more modern technologies, leading to data inefficiencies and operational disruptions. Alawamleh et al. (2021) state that "the main technological barriers to the implementation of Management Information Systems (MIS) include system incompatibility, a lack of integration, and inadequate IT infrastructure support." This indicates that the successful implementation of MIS is highly dependent on the organisation's technological infrastructure readiness [15]. In addition, data security has become an increasingly complex challenge, as the development of digital systems has heightened the risk of cyber threats and data breaches.

b. Organizational and Managerial Challenges

Organizational factors also play a significant role in the successful implementation of an MIS. Common challenges include a lack of support from leadership and employee resistance to system changes. Alawamleh et al. (2021) assert that "a lack of top management support and employee resistance to change are among the most critical organizational barriers to MIS development." Without strong management support, the implementation of an MIS cannot proceed optimally due to a lack of strategic direction [15]. In addition, an organizational culture that is not yet prepared for digital transformation also acts as a barrier, particularly in organizations that still rely on conventional work systems.

c. Human Resources (HR) Challenges

Human resources are a key factor in the success of an ERP system, yet many organizations still face limitations in terms of their employees' digital skills and technological readiness. Sofian et al. (2025) state that "digital transformation in information systems is often hindered by limited digital skills and a lack of employee readiness to adopt new technologies." This highlights the importance of enhancing human resource competencies to support the

implementation of information systems [16]. Without a workforce possessing adequate digital skills, advanced information systems cannot be fully utilized.

d. Financial Challenges

Cost considerations also pose a significant barrier to the implementation of an ERP system, particularly regarding initial investment and ongoing system maintenance costs. This presents a major challenge for small and medium-sized organizations. Inayah and Baihaqi (2026) note that "high implementation costs and the need for ongoing investment are major barriers to the adoption of digital information systems in organizations". [17]Therefore, a well-thought-out financial planning strategy is necessary to ensure the effective implementation of an MIS.

e. Security Challenges and Digital Risks

Data security is a critical issue in today's digital age. Network-based information systems are subject to high-risk threats such as cyberattacks, data theft, and system operational disruptions. Kutnjak and Pihir (2019) state that "cybersecurity risks and data protection issues represent significant barriers to digital transformation and the implementation of information systems." Therefore, organizations need to strengthen their security systems by implementing data encryption and strict access controls [18].

6. Strategy for Implementing the Management Information System in Business

Management information systems (IS) in a business context act as a strategic infrastructure that combines data, technology, and processes to produce accurate, timely, and relevant information for managerial and strategic decision-making. In the digital era, companies can no longer rely solely on intuition to make decisions. They need to use IS to process operational, market, financial, and human resource data, transforming it into measurable and reliable information. Good IS implementation can improve operational efficiency, accelerate the decision-making process, and help organizations respond adaptively to changes in the business environment. Therefore, the implementation of an IS strategy is not only seen as a technical project, but as an important part of a long-term business strategy. [19]

Implementing a management information system (MIS) in business requires a structured approach that takes into account three main aspects: technology, organization, and environment (TOE framework). This shows that the success of MIS implementation is highly dependent on adequate technological infrastructure, support from company leaders, human resource capabilities, and external pressures such as market competition and government policies. Recent studies have shown that organizations that struggle to implement a management information system (MIS) typically have one or more issues, such as limited budgets, lack of information support from top leaders, lack of user training, and inadequate information technology infrastructure. In contrast, organizations that successfully implement MIS typically have developed a well-organized implementation plan, involved users from the outset, identified the most important application features, and prepared ongoing methods for monitoring and reviewing its implementation. This TOE-based approach helps companies design MIS implementation strategies that can be tailored to their respective internal and external conditions. [20]

The process of implementing an MIS strategy can be divided into several main stages, namely identifying needs, planning a strategy, selecting technology, designing the system, implementing it in stages, and conducting continuous evaluation and improvement. Initially, the company must identify the main problems in the work process that it wants to improve by using an MIS, such as delays in preparing reports, errors when entering data, or information

that is not integrated between departments. After that, a planning strategy is created that includes the objectives to be achieved, the areas to be involved, the work schedule, the required funds, and the composition of the MIS project team that involves people from the information technology department, management, and end-user representatives. The technology selection is carried out by considering several aspects such as scalability, the ability to integrate with other systems, data protection, and ease of use, so that the selected MIS solution truly aligns with the company's business strategy vision. [21]

MIS implementation is typically carried out in stages, starting with one or several business units first, before being rolled out to the entire organization. This is done to avoid operational disruptions as much as possible and to identify technical or user behavior issues early on. Several real-world studies have shown that implementing a management information system in stages and with adequate training can lead to greater user satisfaction, reduced negative perceptions of change, and significantly improved company efficiency. For example, research on the implementation of Integrated Management Information Systems (IMIS) in businesses shows that directly combining data from various operational units can speed up the reporting process, reduce redundant data, and assist managers in making more informed decisions. Furthermore, implementing a good management information system also helps reduce operational costs, speed up work processes, and improve the quality of customer service all of which are important indicators for assessing business performance in today's digital age. [22]

The role of Management Information Systems (MIS) in supporting managerial and strategic decision-making is becoming increasingly important, particularly given the increasingly complex and rapidly changing global business environment. Literature studies show that the quality of information generated by a management information system (MIS) directly impacts the speed and accuracy of managerial decisions. This is because managers can identify problems, mitigate risks, and generate alternative actions based on structured and measurable data, rather than just assumptions. In the context of sustainable business, MIS also functions as a supporting tool in designing strategies that encompass economic growth, social responsibility, and environmental aspirations, by simultaneously collecting and analyzing data on environmental, social, and financial performance. Therefore, implementing a good MIS strategy requires incorporating the desired aspects and providing rules, so that the system not only helps gain profits in the short term, but also ensures that the business continues to run well in the long term. [23]

To ensure a successful MIS strategy, companies must consider several key factors identified in empirical research. These key factors include: management commitment and support, active user participation in system design and testing, good data quality and integration, structured organizational change planning, and ongoing user training and mentoring. The absence of any of these factors, such as adequate management support or training, often results in MIS implementation remaining technically limited without significantly impacting company performance. Therefore, the ideal MIS strategy should encompass both technical and managerial approaches, positioning MIS as a business empowerment strategy, not merely an administrative system. [24]

In general, the above content can be concluded that to implement a Management Information System in business, an organized approach based on TOE is required. This approach combines technological, organizational, and environmental factors, and considers the role of Management Information Systems as a tool for making strategic decisions and improving operational efficiency. The use of MIS that is data-focused, sustainable, and

integrated with business strategy will have a real impact on improving a company's competitiveness amidst increasingly fierce global competition.

CONCLUSSION

The integration of NLP into MIS has proven effective in transforming complex textual data into strategic business insights. Features such as sentiment analysis, entity extraction, and automated summarization allow managers to interpret market trends faster than conventional methods. This capability directly improves business process efficiency, decision-making accuracy, and supply chain resilience against external disruptions. However, implementation success is not solely determined by technology but also by top management commitment, clear communication, and human resource readiness. The main barriers still include high costs, fragmented infrastructure, and increasing cybersecurity threats. Therefore, organizations should develop phased strategies that involve digital training, quality control, and system risk management. When these elements are aligned, NLP-based MIS becomes a long-term source of competitive advantage. This study suggests further empirical research to measure the actual return on investment of NLP adoption, especially within Indonesian SMEs.

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