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Application of Business Intelligence in Enterprise Systems to Support Strategic Decision Making

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ABSTRACT

This study investigates the application of Business Intelligence (BI) in corporate systems and its role in supporting strategic decision making in Indonesian companies. Using a quantitative research approach, data were collected from 75 corporate employees who actively use BI-based systems and are involved in managerial or strategic roles. The research instrument employed a Likert scale to measure perceptions of BI application and strategic decision-making effectiveness. Data analysis was conducted using the Statistical Package for the Social Sciences (SPSS) version 25, including descriptive statistics, validity and reliability tests, and regression analysis. The results indicate that Business Intelligence application has a positive and significant effect on strategic decision making, with BI explaining 45% of the variance in decision-making effectiveness. Key aspects such as data quality, analytical capability, and system usability were found to play a crucial role in enhancing decision quality, timeliness, and managerial confidence. The findings provide empirical evidence that Business Intelligence functions as a strategic resource that supports data-driven management and improves organizational competitiveness in the Indonesian corporate context.

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1. Introduction

In recent years, the rapid advancement of information technology and the exponential growth of data have fundamentally transformed the way organizations operate and compete, placing corporations in increasingly complex, dynamic, and uncertain business environments that demand fast, accurate, and well-informed strategic decisions. In this context, the capability to process large volumes of data and convert them into meaningful insights has become critical, while traditional information systems that focus mainly on transactional processing and routine reporting are often inadequate to support strategic-level decision making [1], [2]. As a response to this gap, Business Intelligence (BI) has emerged as a strategic solution, encompassing a set of technologies, applications, and practices designed to collect, integrate, analyze, and present business information from multiple internal and external sources [3], [4]. Through advanced analytical functions such as trend analysis, performance monitoring, forecasting, and scenario evaluation—delivered via dashboards, scorecards, and analytical

reports—BI enables decision makers to obtain a holistic understanding of organizational performance and environmental conditions, thereby strengthening strategic planning and control. Consequently, BI is no longer viewed merely as a technical tool, but rather as a strategic asset that enhances organizational agility, competitiveness, and long-term sustainability [5], [6].

In the Indonesian corporate context, the adoption of Business Intelligence (BI) has received increasing attention as companies confront intensifying competition, digital disruption, and growing regulatory complexity amid a rapidly digitalizing economy. The expansion of business activities across sectors such as manufacturing, finance, telecommunications, retail, and services has generated vast volumes of data; however, many Indonesian companies still face challenges in fully leveraging this data for strategic purposes [7], [8]. Decision making in several organizations remains heavily intuition-driven or dependent on fragmented and descriptive reports, limiting top management's ability to respond proactively to market dynamics and emerging risks. Although BI solutions are increasingly implemented within corporate systems, empirical studies that systematically assess their effectiveness in supporting strategic decision making in Indonesia remain scarce. Prior research has predominantly focused on operational information systems, enterprise resource planning (ERP), or general technology acceptance, with relatively limited attention to the strategic impact of BI utilization, and much of the existing work relies on qualitative or conceptual approaches that offer limited statistical evidence. This research gap underscores the need for quantitative empirical studies that examine how BI systems are used by corporate decision makers and how they influence the quality, speed, and effectiveness of strategic decisions.

Strategic decision making is a critical managerial process that shapes organizational direction, resource allocation, and competitive positioning, and it requires accurate, relevant, and timely information supported by strong analytical capabilities to evaluate alternatives and anticipate future consequences. When information quality is inadequate or analytical support is weak, organizations face a higher likelihood of suboptimal decisions, increased uncertainty, and elevated strategic risk. In this context, understanding the role of Business Intelligence (BI) in enhancing information quality, analytical capability, and managerial insight becomes essential, particularly in emerging economies such as Indonesia, where the level of maturity in data-driven decision making varies considerably across organizations. From a managerial perspective, the effectiveness of BI implementation depends not only on technological infrastructure but also on system integration, data quality, usability, and user competence. Even advanced BI tools may fail to generate strategic value if they are poorly integrated with existing systems, rely on inaccurate or inconsistent data, or are misaligned with managerial needs. Therefore, empirical evaluation of BI implementation from the perspective of corporate users is crucial to identify the key factors that influence its effectiveness in supporting strategic decision making, while also providing evidence-based insights for managers and policymakers to improve BI adoption and utilization.

Based on these considerations, this study aims to examine the application of Business Intelligence (BI) in corporate systems and its role in supporting strategic decision making in Indonesia by adopting a quantitative research approach. Data are collected from corporate respondents who actively use BI-based systems, focusing on their perceptions of BI implementation and its contribution to decision-making support, using a structured questionnaire with a Likert scale. The data are then analyzed using SPSS version 25 to provide empirical evidence on the relationship between BI application and strategic decision-making outcomes. This study offers a twofold contribution: academically, it enriches the

information systems and management literature by providing quantitative evidence from the Indonesian corporate context, which remains relatively underrepresented in BI research; and practically, it provides insights for corporate leaders and information system managers regarding the strategic value of Business Intelligence and the key aspects that must be strengthened to maximize its impact on decision making. Ultimately, this research reinforces the importance of data-driven management and highlights Business Intelligence as a critical enabler of strategic decision making in Indonesian corporations.

2. Literature Review

2.1 Business Intelligence

Business Intelligence (BI) has evolved as a critical component of modern organizational information systems aimed at supporting managerial and strategic decision making by transforming raw data into meaningful and useful information. Conceptually, BI encompasses a collection of technologies, tools, architectures, databases, and analytical methods designed to provide accurate, timely, and relevant information that enables managers to understand business performance, identify patterns and trends, and formulate effective strategies, with a primary focus on analysis, insight generation, and knowledge discovery rather than transaction processing [1], [2], [9]. From a technological perspective, BI systems typically comprise data warehouses, data integration tools, online analytical processing (OLAP), data mining techniques, and visualization applications such as dashboards and scorecards, which work collectively to consolidate data from diverse sources and present it in a format that supports analytical reasoning. Through strong data integration capabilities, BI helps organizations overcome data silos and achieve a unified view of business operations, thereby playing a vital role in enabling data-driven management and enhancing organizational responsiveness in increasingly data-intensive environments [5], [10].

2.2 Business Intelligence in Corporate Systems

The application of Business Intelligence (BI) within corporate systems reflects a strategic shift from operational reporting toward analytical and predictive decision support, as corporate platforms such as Enterprise Resource Planning (ERP), Customer Relationship Management (CRM), and Supply Chain Management (SCM) generate vast volumes of transactional data that require higher-level analysis [11]. BI complements these systems by extracting, transforming, and analyzing data to produce insights that support both strategic and tactical decisions, while system integration enables organizations to align operational data with strategic objectives and key performance indicators. Prior studies indicate that the effectiveness of BI implementation is influenced by several critical factors, including data quality, system integration, usability, and organizational readiness [2], [12]. High-quality and consistent data are essential for generating reliable insights, well-integrated systems ensure information completeness, and strong usability and user acceptance allow decision makers to interpret and apply BI outputs effectively. Consequently, BI is increasingly perceived in corporate environments not merely as an IT investment, but as a strategic capability that enhances competitiveness, supports innovation, and contributes to long-term organizational performance.

2.3 Strategic Decision Making

Strategic decision making is a fundamental managerial activity that shapes an organization's long-term direction, competitive positioning, and resource allocation, and it is inherently complex, unstructured, and characterized by high uncertainty and significant consequences. As a result, strategic decisions require comprehensive and reliable

information, rigorous analytical evaluation, and informed managerial judgment [13], [14]. The quality of such decisions is strongly influenced by the availability, timeliness, and relevance of information, as well as by the analytical tools used to interpret it. Decision-making literature emphasizes that effective strategic decisions are supported by accurate and timely data combined with analytical capabilities that enable managers to evaluate alternatives and assess potential outcomes. In the absence of adequate information systems, decision makers tend to rely more heavily on intuition or experience, which may increase the risk of bias and error. Therefore, information systems that enhance information quality and analytical depth are widely regarded as essential enablers of effective strategic decision making [15], [16].

2.4 *Role of Business Intelligence in Supporting Strategic Decision Making*

Business Intelligence (BI) is widely recognized as a key enabler of strategic decision making due to its capacity to deliver integrated, analytical, and forward-looking information that supports managerial evaluation and control. Through real-time dashboards, performance metrics, and predictive analyses, BI systems assist managers in monitoring organizational performance while identifying strategic opportunities and potential threats [13], [14]. By reducing information uncertainty, enhancing transparency, and facilitating evidence-based assessments, BI improves the overall effectiveness of strategic decision making. Empirical studies across various organizational contexts indicate that BI usage positively influences decision quality, decision speed, and managerial confidence, enabling organizations to move beyond descriptive reporting toward diagnostic and predictive analysis. Moreover, BI contributes to organizational learning by supporting continuous performance evaluation and promoting knowledge sharing across departments, thereby strengthening proactive and strategic responses to dynamic environmental changes [15], [16].

2.5 *Business Intelligence Adoption in Indonesia*

In emerging economies such as Indonesia, the adoption of Business Intelligence (BI) presents both significant opportunities and notable challenges, as corporations operate in a rapidly changing environment characterized by digital transformation, market volatility, and intensifying competition. Although many organizations have invested in information technology infrastructure, the level of BI maturity varies considerably across sectors and firm sizes, with some companies successfully integrating BI into their strategic management processes while others continue to face constraints related to data quality, system integration, and user competencies [17], [18]. The Indonesian context is particularly relevant for BI research because organizational culture, resource limitations, and differing levels of technological readiness can substantially influence BI effectiveness. However, existing studies in Indonesia have largely concentrated on technology adoption or operational information systems, offering limited quantitative evidence on the strategic impact of BI. This research gap underscores the importance of empirically examining BI application within Indonesian corporate systems and its contribution to strategic decision making [6].

2.6 *Hypothesis Development*

Based on the theoretical and empirical literature, Business Intelligence is expected to play a significant role in enhancing strategic decision making by improving information quality, analytical capability, and managerial insight. The integration of BI within corporate systems allows organizations to generate actionable knowledge that supports strategic planning and evaluation. Accordingly, this study proposes the following hypothesis:

H1: The application of Business Intelligence in corporate systems has a positive and significant effect on strategic decision making in Indonesian companies.

3. Research Methods

3.1 Research Design

This study employs a quantitative research design with an explanatory approach to examine the effect of Business Intelligence (BI) application in corporate systems on strategic decision making in Indonesian companies. The quantitative approach is considered appropriate because the study aims to test a hypothesized relationship between variables using numerical data and statistical analysis. By using this approach, the research is able to objectively measure respondents' perceptions of BI implementation and its contribution to strategic decision-making processes. The research is cross-sectional in nature, meaning that data were collected at a single point in time. This design allows the study to capture the current condition of BI application and its perceived impact on strategic decision making across different corporate settings in Indonesia.

3.2 Population and Sample

The population of this study consists of corporate employees in Indonesia who are directly involved in managerial or analytical roles and actively use Business Intelligence or BI-supported information systems in their organizations. These respondents are considered relevant because they interact with BI systems and utilize analytical information in decision-making processes. The sampling technique used in this study is purposive sampling, in which respondents are selected based on specific criteria. The criteria include: (1) being employed in a corporate organization operating in Indonesia, (2) having experience in using BI-based systems or analytical dashboards, and (3) being involved in managerial, supervisory, or strategic decision-making activities. Based on these criteria, a total of 75 valid responses were obtained and used for data analysis. This sample size is considered adequate for basic statistical analysis in quantitative research.

3.3 Research Variables and Measurement

This study examines two main variables, namely Business Intelligence (BI) application as the independent variable and strategic decision making as the dependent variable. The BI application variable refers to the extent to which BI systems are implemented and utilized within corporate systems to support managerial activities, and it is measured using several indicators adapted from the BI and information systems literature, including system integration, data quality, analytical capability, information accessibility, and system usability. Meanwhile, strategic decision making refers to the effectiveness of managerial decisions at the strategic level, reflecting the ability of decision makers to produce timely, accurate, and well-informed strategic decisions, and is measured using indicators such as decision quality, decision timeliness, clarity of strategic insight, and confidence in decision outcomes. All indicators in this study are measured using a five-point Likert scale, ranging from 1 ("strongly disagree") to 5 ("strongly agree"), which enables respondents to express the degree of their agreement with each statement and supports quantitative analysis.

3.4 Data Collection Technique

Primary data in this study were collected using a structured questionnaire designed to capture respondents' perceptions of Business Intelligence (BI) application and its role in supporting strategic decision making. The questionnaire consisted of two main sections, namely respondent profile information and measurement items related to the research variables. Distribution was conducted through online platforms and direct communication to ensure accessibility and convenience for respondents. Prior to dissemination, the questionnaire items were reviewed to ensure

clarity and alignment with the research objectives, and only complete and valid responses were included in the final dataset for analysis.

3.5 Data Analysis Technique

The data collected from the questionnaires were analyzed using the Statistical Package for the Social Sciences (SPSS) version 25 through several stages to ensure the reliability and validity of the results. Descriptive statistical analysis was first employed to summarize respondent characteristics and provide an overview of data distribution, including mean values and standard deviations for each variable. Validity testing was then conducted using correlation analysis to assess whether each measurement item adequately represented its intended construct, with items exceeding the acceptable correlation threshold considered valid. Reliability testing followed using Cronbach's alpha to evaluate the internal consistency of the measurement scales, where a value greater than 0.70 indicated acceptable reliability. Finally, hypothesis testing was performed using regression analysis to examine the effect of Business Intelligence application on strategic decision making, with a significance level set at 0.05.

4. Results and Discussion

4.1 Respondent Profile

A total of 75 valid questionnaires were collected and analyzed. Respondents were corporate employees involved in managerial, supervisory, or analytical roles and had experience using Business Intelligence–based systems. The diversity of roles ensures that the data reflect perceptions from users who actively engage in strategic decision-making processes.

Table 1. Respondent Characteristics

Characteristic	Category	Frequency	Percentage
Position	Managerial level	29	38.7%
	Supervisor	24	32.0%
	Analyst/Staff	22	29.3%
Work Experience	< 5 years	18	24.0%
	5–10 years	34	45.3%
	> 10 years	23	30.7%
BI Usage Duration	< 2 years	21	28.0%
	2–5 years	36	48.0%
	> 5 years	18	24.0%

Source: Author (2025)

Table 1 presents the characteristics of respondents, showing a balanced representation across organizational roles, work experience, and Business Intelligence (BI) usage duration. In terms of position, respondents are relatively evenly distributed among managerial level (38.7%), supervisors (32.0%), and analysts/staff (29.3%), indicating that BI usage and strategic decision-making perspectives are captured from multiple hierarchical levels within organizations. This distribution suggests that BI is not only utilized by top management but also by middle managers and operational analysts who contribute to decision-support processes. Regarding work experience, the majority of respondents have moderate to extensive professional experience, with 45.3% having 5–10 years of experience and 30.7% having more than 10 years, implying that most respondents possess sufficient organizational knowledge and contextual understanding to evaluate the role of BI in strategic decision making. Meanwhile, BI usage duration shows that nearly half of the respondents (48.0%) have used BI systems for 2–5 years, while 24.0% have more than five years of experience, indicating a relatively mature level of BI exposure among respondents.

4.2 Descriptive Statistics

Descriptive analysis was conducted to assess respondents' perceptions of Business Intelligence application and strategic decision making. Mean values above 3.50 indicate a positive perception.

Table 2. Descriptive Statistics of Research Variables

Variable	Indicator	Mean	Std. Deviation
Business Intelligence Application	System integration	4.02	0.61
	Data quality	4.15	0.58
	Analytical capability	4.08	0.63
	Information accessibility	3.97	0.66
	System usability	4.10	0.59
Average BI Score		4.06	0.61
Strategic Decision Making	Decision quality	4.12	0.60
	Decision timeliness	3.95	0.67
	Strategic insight clarity	4.09	0.62
	Decision confidence	4.05	0.64
Average SDM Score		4.05	0.63

Source: Author (2025)

Table 2 presents the descriptive statistics of the research variables, showing generally high mean scores for both Business Intelligence (BI) application and strategic decision making, which indicates positive respondent perceptions regarding the implementation and usefulness of BI within their organizations. The BI application variable records an average score of 4.06 (SD = 0.61), reflecting a strong overall assessment, with data quality emerging as the highest-rated indicator (mean = 4.15), suggesting that accuracy, consistency, and reliability of BI data are perceived as key strengths. System usability (mean = 4.10) and analytical capability (mean = 4.08) are also evaluated favorably, indicating that BI tools are considered user-friendly and effective in supporting analytical activities, while system integration (mean = 4.02) and information accessibility (mean = 3.97), although still rated positively, show relatively lower scores that may signal ongoing challenges in fully integrating BI with existing systems and ensuring seamless access to information. Similarly, the strategic decision-making variable demonstrates a high average score of 4.05 (SD = 0.63), suggesting that BI-supported decisions are generally perceived as effective, with decision quality receiving the highest mean (4.12), followed by strategic insight clarity (mean = 4.09) and decision confidence (mean = 4.05), highlighting BI's contribution to improving managerial understanding and confidence in decision outcomes. However, decision timeliness records the lowest mean score (3.95), indicating that despite improvements in decision quality, the speed of strategic decision making may still be constrained by organizational processes or system responsiveness.

4.3 Validity and Reliability Testing

Validity testing in this study was conducted using item–total correlation with a critical value (r-table) of 0.227 for a sample size of 75 at a significance level of $\alpha = 0.05$, and the results show that all measurement items exceeded this threshold, indicating that they are valid. Specifically, the r-count values for the Business Intelligence (BI) application variable ranged from 0.427 to 0.712 across 10 items, while those for the strategic decision-making variable ranged from 0.393 to 0.687 across 8 items, confirming that all indicators appropriately represent their respective constructs. Reliability testing was subsequently performed using

Cronbach's alpha, with values above 0.70 considered acceptable, and the results indicate strong internal consistency for both variables, with Cronbach's alpha values of 0.881 for BI application and 0.865 for strategic decision making.

4.4 Regression Analysis and Hypothesis Testing

Simple linear regression analysis was performed to test the hypothesis that Business Intelligence application positively affects strategic decision making.

Table 3. Regression Analysis Results

Variable	β (Beta)	t-value	Sig.
Business Intelligence Application → Strategic Decision Making	0.677	7.843	0.000
Constant	1.213	3.106	0.003

Source: Author (2025)

Table 3 presents the results of the regression analysis examining the effect of Business Intelligence (BI) application on strategic decision making. The findings indicate that BI application has a strong and positive influence on strategic decision making, as reflected by a standardized beta coefficient (β) of 0.677. This result suggests that improvements in BI implementation are associated with substantial increases in the effectiveness of strategic decision making within organizations. The t-value of 7.843, which is well above the critical threshold, and a significance level of 0.000 ($p < 0.05$) confirm that this relationship is statistically significant. These results provide empirical evidence that BI plays an important role in enhancing strategic decision processes by improving the quality and availability of analytical information. The significant constant value (1.213; $p = 0.003$) indicates that even in the absence of BI application, a baseline level of strategic decision making exists, although its effectiveness is considerably strengthened when BI is applied. Overall, the regression results support the study's hypothesis and reinforce the view that Business Intelligence is a key enabler of effective strategic decision making in corporate contexts.

The model summary indicates a strong relationship between Business Intelligence (BI) application and strategic decision making, with a correlation coefficient (R) of 0.671, an R Square value of 0.453, and an adjusted R Square of 0.445, suggesting a good model fit. The regression results demonstrate that BI application has a positive and statistically significant effect on strategic decision making ($\beta = 0.67$; $p < 0.001$), confirming that improvements in BI implementation are associated with higher effectiveness of strategic decisions. The R Square value indicates that approximately 45% of the variance in strategic decision making can be explained by BI application, while the remaining 55% is attributable to other factors not included in this model.

4.5 Discussion

The findings of this study provide empirical evidence that the application of Business Intelligence (BI) within corporate systems significantly enhances strategic decision making in Indonesian companies. The strong regression coefficient indicates that organizations with better-integrated BI systems, higher data quality, and stronger analytical capabilities are more likely to produce effective and timely strategic decisions. This result is consistent with the theoretical perspective that BI functions as a mechanism for transforming raw data into actionable insights, thereby reducing uncertainty and supporting more rational decision making in complex strategic environments [17], [18].

The descriptive analysis further shows that data quality and analytical capability receive the highest evaluations, suggesting that BI systems are particularly valuable in improving the accuracy, depth, and rigor of

managerial analysis. These capabilities allow decision makers to assess strategic alternatives more systematically and to better anticipate potential risks and opportunities. In addition, the positive perception of system usability indicates that BI tools are relatively accessible and can be effectively used by managers, which is essential for ensuring that analytical outputs are translated into concrete strategic actions rather than remaining as technical reports [6].

From a managerial perspective, the finding that BI application explains 45% of the variance in strategic decision making underscores its substantial strategic importance. Although BI is not the only factor influencing decision effectiveness, it represents a major enabling capability within data-driven management practices. For Indonesian corporations operating in increasingly competitive and uncertain environments, strengthening BI implementation can support more informed strategic planning, improve performance monitoring, and enhance organizational agility. Overall, this study confirms that Business Intelligence should be viewed not merely as a supporting technology, but as a strategic resource that directly contributes to improved strategic decision outcomes through continued investment in systems, data governance, and user capability development.

5. Conclusion

This study concludes that the application of Business Intelligence in corporate systems significantly supports strategic decision making in Indonesian companies. The empirical results demonstrate that well-implemented BI systems enhance the quality, timeliness, and confidence of strategic decisions by providing accurate, integrated, and analytically rich information. The findings highlight that data quality, analytical capability, and system usability are critical factors in maximizing the strategic value of Business Intelligence. From a practical perspective, the study emphasizes the importance for corporate management to continuously invest in BI infrastructure, data governance, and user competencies to strengthen data-driven decision-making processes. Academically, this research contributes to the limited empirical literature on Business Intelligence in emerging economies by providing quantitative evidence from the Indonesian context. Future studies are encouraged to incorporate additional variables and larger samples to further explore the broader organizational impacts of Business Intelligence adoption.

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