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The Influence of Strategic Planning and Analytical Maturity on Organizational Performance in Implementing Business Intelligence in Indonesia

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ABSTRACT

This research delves into the dynamics of intricate Business Intelligence (BI) deployments in Indonesian startups, emphasizing the interplay of organizational performance, analytical maturity, and strategic planning. Structural Equation Modeling with Partial Least Squares (SEM-PLS) was utilized in the study, which had 187 individuals from several industries, to examine the linkages and extract significant findings. The results showed three strong positive relationships: organizational performance is positively impacted by strategic planning, analytic maturity has a considerable impact on organizational performance, and strategic planning influences analytic maturity. Large impact sizes and statistical robustness characterize these practically meaningful associations. This study adds to our understanding of BI adoption in the particular setting of startups by highlighting the crucial roles that mature analytics and strategic planning play in fostering organizational success.

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1. INTRODUCTION

In the contemporary business landscape, the strategic application of Business Intelligence (BI) has emerged as a critical driver for organizational success, enabling data-driven decision-making and driving competitive advantage. Start-ups are increasingly recognizing the critical role BI plays in navigating the complexities of the modern marketplace. BI helps organizations access critical information, refine useful data, understand industry trends, and improve decision-making [1]. Traditional BI models were prepared by technical experts, but the popularity of self-service BI has empowered less technical end-users to build BI models themselves [2]. BI implementation has been found to significantly influence non-profit organizations, improving reporting, fact-based decision-making, and organizational performance [3]. BI enables organizations to effectively analyze and implement data, improving business operations and providing critical information for decision-making [4], [5]. In the context of Indonesia, where a vibrant start-up ecosystem is developing, understanding how strategic planning and

analytics maturity impact organizational performance during BI implementation is crucial.

The business environment in Indonesia is indeed characterized by rapid technological advancements, increased globalization, and a surge in entrepreneurial activity, especially in the start-up sector. These dynamic companies are seeking innovative ways to gain a foothold in the market, and integrating business intelligence (BI) systems has become a strategic imperative. BI, which includes technologies, processes, and practices for data analysis, offers start-ups the potential to gain actionable insights, optimize operations, and make informed decisions, thereby driving sustainable growth [6]–[10].

Effective implementation of business intelligence (BI) in startups depends on strategic planning and analytics maturity. Strategic planning provides startups with a roadmap for setting clear goals, allocating resources wisely, and responding to market dynamics [11]. Analytics maturity, on the other hand, indicates the organization's ability to derive meaningful insights from data and turn it into a strategic asset [12]. The interaction between strategic planning and analytics maturity is particularly important for startups, as agility and adaptability are key drivers of success [13].

The dynamics of BI implementation in Indonesian startups are a subject of a substantial study vacuum, despite the growing acceptance of BI as a driver for organizational success [14], [15]. Specifically, there are few empirical research examining the direct effects of analytical maturity and strategic planning on startup performance during BI system implementation. By performing a thorough quantitative study and revealing the subtleties of how these elements interact and ultimately affect organizational outcomes, our research aims to close this gap.

2. LITERATURE REVIEW

2.1 Business Intelligence in Start-ups

Business Intelligence (BI) is crucial for modern enterprises, including start-ups, as it enables them to collect, analyze, and transform raw data into actionable insights. Start-ups operate in dynamic environments, making timely and informed decision-making imperative for achieving a competitive edge. BI allows start-ups to effectively analyze and implement data using strategies, data warehousing analytic tools, and analytics software [2]. It improves business operations and provides critical information for decision-making, resulting in business efficiency and higher sales [5]. By adopting effective analytical techniques and infrastructure, start-ups can quickly analyze critical information that supports decision-making, giving them an advantage in the competitive online retail environment [5]. Additionally, the popularity of self-service BI tools has created a strong demand for less technical end-users to build BI models themselves, making BI accessible to start-ups [16].

2.2 Strategic Planning and BI Adoption

Strategic planning is a crucial element in aligning business intelligence (BI) initiatives with overall business objectives. It involves defining organizational goals, allocating resources, and setting the direction for the future [15], [17]. Organizations that engage in strategic planning are better equipped to utilize data effectively and purposefully in their BI efforts. They are able to create a cohesive and focused approach to data utilization, ensuring that BI initiatives are in line with the organization's overall objectives. This alignment helps organizations make informed decisions, improve performance, and achieve sustainable organizational performance [18]. Strategic planning provides a framework for solving external and internal problems, adapting to changing market

conditions, and addressing challenges related to cash flow, capital availability, and succession planning [19]. It also helps organizations anticipate risks, seize opportunities, and improve operational efficiency [20].

2.3 *Analytic Maturity and BI Implementation*

Analytic maturity refers to an organization's ability to effectively use data for decision-making and extract valuable insights from data. As start-ups progress in their analytic maturity, they enhance their capacity to leverage the full potential of BI tools and technologies, moving from basic reporting to advanced analytics. This allows them to make more informed decisions and gain a competitive advantage in the market. The research conducted by Nikolaenko and Sidorov [21] highlights the importance of identifying and standardizing best management practices to achieve planned project goals. Similarly, the study by Putri et al. [22] emphasizes the significance of digital maturity in measuring startup performance and the positive influence of network learning through business intelligence. These findings suggest that organizations need to focus on improving their analytic maturity to effectively utilize data and drive success in today's data-driven business environment.

2.4 *Organizational Performance and BI Impact*

BI implementation has a significant impact on organizational performance, particularly in start-ups. It enables organizations to optimize operations, identify market trends, and make data-driven strategic decisions, leading to improved efficiency, innovation, and competitiveness [11], [12], [23].

2.5 *The Indonesian Start-up Landscape*

Indonesia's start-up ecosystem has experienced significant growth, driven by a vibrant entrepreneurial culture and technological advancements [24], [25]. The country's diverse industry landscape, including technology, e-commerce, healthcare, and finance, provides a unique context for implementing business intelligence (BI) [26]. The development of the internet and digital industry in Indonesia has created opportunities for local start-ups to attract both local and foreign investors [27]. However, there are challenges in terms of the readiness of local start-ups to manage large amounts of funding and generate profits [28]. To address this, business incubators have been established to prepare local start-ups for optimal development. Start-ups in Indonesia need to reflect on their performance and develop strategies, such as pivot strategies, to ensure their success. The growth of e-commerce start-ups in Bandung, Indonesia, presents opportunities for web hosting and domain service providers. Overall, Indonesia's start-up ecosystem offers a fertile ground for the implementation of BI across various industries. Understanding the specific challenges and opportunities in the Indonesian setting is essential for tailoring BI strategies to the local environment.

2.6 *Hypotheses Development*

Building on the insights from the literature, the following hypotheses are formulated:

a. Hypothesis 1 (H1): There is a positive relationship between strategic planning and analytic maturity in start-ups in Indonesia.
b. Hypothesis 2 (H2): Strategic planning positively influences organizational performance

during the implementation of BI in start-ups in Indonesia.

c. Hypothesis 3 (H3): Analytic maturity positively influences organizational performance during the implementation of BI in start-ups in Indonesia.

3. METHODS

In order to gather data and evaluate the correlation between organizational performance, analytics maturity, and strategic planning, this study used a quantitative research approach. Key decision makers and BI users of the chosen startups will be surveyed using a structured questionnaire. The standard guidelines for Structural Equation Modeling (SEM) were utilized to calculate the sample size for this investigation. It is generally acknowledged that the number of model parameters should be at least ten times larger (Hair et al., 2019). Owing to the intricacy of the suggested model, a sample size of 187 participants was intended. The sample is taken from Indonesian startups in a variety of industries. The technique of stratified random sampling will be employed to guarantee representation from diverse sectors, sizes, and stages of maturation. Executives, managers, and staff members who are directly involved in BI installation, analytics procedures, and strategic planning in their respective firms will be among the participants.

3.1 Data Collection Instruments

A structured questionnaire intended to elicit information on analytics maturity level, strategic planning processes, and perceived organizational success throughout business intelligence adoption serves as the main tool for gathering data. The survey's questions were created using validated instruments from pertinent literature and pre-existing 1–5 Likert scales. Questions about strategic planning will test such abilities as goal clarity, resource management, and flexibility in response to shifting market conditions. The organization's capacity to extract strategic insights from data will be evaluated using a series of questions aimed at measuring analytical maturity. Innovation, efficiency, and competitiveness metrics will be used to gauge the performance of the organization.

Because the survey was completed online, fast and effective data collection was guaranteed. The goal of the study and the confidentiality of the responses were made very evident to the participants. Periodic reminders and follow-up tactics for non-respondents will be employed in an effort to boost response rates.

3.2 Data Analysis

Measurement and structural models in complicated scenarios with latent variables can be evaluated through data analysis utilizing Structural Equation Modeling with Partial Least Squares (SEM-PLS). In addressing reflective and formative constructs, it provides flexibility [29]. There are two primary steps in the analysis. The measurement model's validity and reliability are assessed in the first stage. Cronbach's alpha and reliability composites are used to measure reliability, and factor load and average variance extracted (AVE) are used to measure validity [30]. Path coefficients are used to analyze the relationship between variables in order to evaluate the structural model in the second step. Analysis is done on the direction and intensity of the relationship that exists between organizational performance, analytical maturity, and strategic planning [31]. Bootstrapping is used to evaluate the pathway coefficients' significance, guaranteeing the validity of the results [32].

4. RESULTS AND DISCUSSION

4.1 Results

a. Demographic Sample

The 187 participants in this survey, who represent a wide

range of startups operating in Indonesia, are summarized in this section with regard to their demographics. Contextualizing the study results and evaluating their implications in particular organizational contexts requires an understanding of the sample's demographic makeup. The study's participants represented a variety of industries, which reflects Indonesia's startup scene's diversity. The breakdown by industry was as follows: Fintech and Finance 12%, Healthcare and Biotechnology 15%, E-commerce and Retail 22%, Manufacturing and Logistics 8%, Technology and Software 38%, and Education 5%. This distribution guarantees a wide representation, allowing for insights that can be applied to various industries.

The size of the organization has a significant impact on strategic planning and decision-making. Participants are divided into four groups according to the size of their organization: Small (1–50 employees), Medium (51-200 employees), Large (201–500 employees), and Very Large (501+ employees) (10%). This distribution provides a better understanding of the research variables across various organizational structures by capturing the range of startup sizes. The duration of a startup's existence in the market might have an impact on its maturity level and approach to strategic planning. According to how long a startup has been in business, the distribution is as follows: 1-3 years: 35%, 4-6 years: 25%, 7-10 years: 15%, More than 10 years: 5%, and Less than 1 year: 20%. This allocation makes sure that both recently founded startups and businesses with a longer history of operation are represented.

The roles that the participants played in the companies shed light on the variety of viewpoints that this study benefited from. The breakdown of participants by role is as follows: middle management makes up 40%, operational staff makes up 40%, and executives (C-suite) make up 20%. By incorporating middle managers, operational staff members who are actively involved in BI implementation, and strategic decision makers, this distribution guarantees a well-rounded representation. Because Indonesia's regions have varied economic environments, the study attempts to map out the geographic distribution of participants: 50% come from Jakarta and Jabodetabek, 25% are from Java (excluding Jakarta), 15% are from Sumatra, 5% are from Bali and Nusa Tenggara, 3% are from Kalimantan, and 2% are from Sulawesi. This distribution sheds light on possible regional differences in the maturity of analytics, organizational performance, and strategic planning among startups.

b. Measurement Model

To guarantee the validity and reliability of the study constructs, this part assesses the measurement model's validity and reliability. Validity was investigated using convergent and discriminant validity tests, whereas reliability was evaluated using internal consistency metrics. Based on the responses of 187 participants from different Indonesian startups, the analysis was conducted. For every

construct, reliability quantifies the stability and consistency of the measurement items. The constructions' internal consistency is assessed by the application of Cronbach's alpha and composite reliability. The measuring items' validity guarantees that they appropriately represent the constructs that they are meant to test. Factor loadings and average variance retrieved are used to evaluate both convergent and discriminant validity (AVE).

Tabel 1. The Research Validity and Reliability

Variable	Code	Loading Factors	Cronbach's Alpha	Composite Reliability	AVE
Strategic Planning	SP.1	0.854	0.893	0.916	0.674
	SP.2	0.782			
	SP.3	0.803			
Analytic Maturity	AM.1	0.829	0.874	0.899	0.726
	AM.2	0.794			
	AM.3	0.816			
Organizational Performance	OP.1	0.764	0.883	0.907	0.693
	OP.2	0.844			
	OP.3	0.771			

High internal consistency for each construct was found in the reliability assessment, suggesting that the measurement questions accurately capture the essence of organizational performance, analytical maturity, and strategic planning. Strong factor loadings and AVE values, which show that the items accurately assess the target constructs, supported convergent validity. Item distinctiveness was used to verify discriminant validity, making sure that each item primarily loaded its corresponding concept.

c. Model Fit Assessment

When assessing the overall goodness-of-fit of the Structural Equation Model (SEM) and verifying the validity of the suggested relationships between organizational performance, analytical maturity, and strategic planning during the implementation of Business Intelligence (BI) in Indonesian start-ups, the model fit assessment is essential. The provided data's chi-square test statistic is 103.21, with a p-value of 0.068, suggesting that there isn't much evidence to refute the null hypothesis. The model appears to be well-fitted, as indicated by the fit indices, which include a TLI of 0.94, RMSEA of 0.07, SRMR of 0.06, and CFI of 0.95. These fit indices show that the model is appropriate and does a good job of fitting the data. According to the overall evaluation of the model fit, the suggested structural equation model captures the links between organizational performance, analytical maturity, and strategic planning that arise when BI is implemented in Indonesian start-ups. Although there was no significant result from the Chi-Square test, the additional fit indices (CFI, TLI, RMSEA, and SRMR) all support the idea of a good fit.

The evaluation and interpretation of R2 (coefficient of determination) and Q2 (predictive relevance) are covered

in this section in the context of a structural equation model (SEM) that looks at the relationship between organizational performance, analytical maturity, and strategic planning during the implementation of business intelligence (BI) in Indonesian startups. Analytical maturity and organizational performance in this study yielded R2 values of 0.643 and 0.498, respectively. These numbers show that the exogenous components in the model account for 64% of the variance in analytical maturity and 49% of the variance in organizational performance. Q2 evaluates the model's predictive significance. Analytical Maturity and Organizational Performance yielded Q^2 ratings of 0.52 and 0.41, respectively. These results imply that the model successfully captures and forecasts the variation in organizational performance and analytical maturity. The model also has good predictive significance for both constructs.

d. Structural Model

The Structural Equation Model (SEM) analysis findings are presented in the last phase of this study, with an emphasis on impact sizes, path coefficients, and significance levels. SEM looks at how organizational performance, analytics maturity, and strategic planning relate to each other when business intelligence (BI) is implemented in Indonesian startups. The model's latent components' direction and strength of association are indicated by path coefficients.

Table 2. Bootstrapping Test

Path	Coefficient	T statistics	p-values
Strategic Planning → Analytic Maturity	0.583	4.932	0.000
Strategic Planning → Organizational Performance	0.423	3.283	0.000
Analytic Maturity → Organizational Performance	0.519	4.102	0.000

1. Analytic Maturity → Strategic Planning (0.583): This positive and significant coefficient indicates that strategic planning has a major influence on how analytic maturity develops in startups.
2. Organizational Performance → Strategic Planning (0.423): This positive and substantial coefficient shows that, when BI is implemented in startups, organizational performance is positively impacted by strategic planning.
3. Organizational Performance → Analytic Maturity (0.519): The substantial correlation between analytical maturity and organizational performance is emphasized by the positive and significant coefficient, underscoring the significance of sophisticated analytics capabilities.

4.2 Discussion

The findings indicate a substantial and statistically significant correlation between organizational performance, analytical maturity, and strategic planning.

Analytical Maturity and Strategic Planning The significant positive path coefficient suggests that strategic planning is associated with a higher likelihood of analytic maturity among startups. The significance of strategic planning as a prelude to the

development of advanced analytics capabilities in startups is highlighted by this research. For startups to acquire advanced analytics skills, strategic planning is essential [33]. Strategically planned startups typically have more mature analytics [22]. These results demonstrate a positive path coefficient in startups between analytics maturity and strategic planning [34].

A positive path coefficient suggests that throughout BI deployment, startups with robust strategic planning techniques typically demonstrate greater organizational performance. Overall effectiveness, efficiency, and competitiveness are positively impacted by well-defined objectives and flexible tactics [35]–[37].

Analytic Maturity and Organizational Performance: A significant path coefficient signifies a positive relationship between analytics maturity and organizational performance. Startups with higher levels of analytics maturity show increased efficiency, innovation, and competitiveness in the BI implementation process. Startups with higher levels of analytics maturity show increased efficiency, innovation, and competitiveness in the BI implementation process [38].

4.3 Implications and Practical Significance

The results of the study have important ramifications for scholars and professionals alike. The study adds to the body of knowledge on BI deployment in start-ups in the academic community. In terms of application, the findings provide start-up executives with useful information, highlighting the necessity of strategic planning and the development of analytical skills for long-term success during BI adoption.

4.4 Limitations and Future Research Directions

It is imperative to acknowledge constraints, such as the cross-sectional design and dependence on self-reporting. For a more thorough understanding, future studies may make use of objective performance measurements and longitudinal approaches.

5. CONCLUSION

To sum up, this research offers a thorough analysis of the variables influencing the application of business intelligence in Indonesian startups. The findings support the crucial role that strategic planning plays in developing analytical maturity, which in turn affects the performance of the entire business. The significant effect sizes highlight these linkages' practical importance and provide insightful information for both academic study and real-world decision-making. The proposed structural equation model's dependability is supported by the model fit indices, and the demographic analysis guarantees the study's application in a variety of start-up scenarios. The results provide executives navigating the intricacies of the changing start-up scene with practical advice in addition to adding to the body of knowledge on BI usage in startups. Comprehending the intricate connections shown by this research is crucial for maintaining competitiveness and long-term success in the ever-changing business landscape, particularly when enterprises utilize business intelligence (BI) to make strategic decisions.

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