The impact of applying business intelligence on corporate profitability management (An applied Study)

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Abstract

This research aims to analyze the impact of Business Intelligence (BI) on enhancing corporate profitability by addressing the stages of data collection, analysis, reporting, and decision-making. The goal is to verify the extent to which BI tools contribute to enabling managers to make strategic decisions based on accurate and reliable information, which positively reflects on the efficiency of profitability management. Using a descriptive-analytical approach, an electronic questionnaire (The Impact of Business Intelligence Application on Corporate Profitability Management) comprising 32 items was administered. The instrument measured two main variables. The first, Business Intelligence (BI), consisted of 17 items divided into three principal dimensions: Data Collection and Accuracy (6 items), Data Analysis (5 items), and Reporting and Decision Making (6 items). The second variable, Profitability Management, included 15 items, equally divided into three dimensions: Customer Monitoring and Behavior Analysis (5 items), Market Analysis and Trend Forecasting (5 items), and Strategy Guidance and Decision Making (5 items). The results indicated a positive and statistically significant relationship between BI and Profitability Management. The dimension of Reporting and Decision Making exerted the strongest influence coefficient is 0.451, followed by the data collection and Accuracy dimension coefficient is 0.356, and finally data analysis coefficient is 0.200. The proposed model demonstrated high explanatory power, accounting (the coefficient of determination) is 80.6% of the variance in profitability management. The current research recommends establishing specialized data governance offices, intensifying training programs on BI system usage, linking performance indicators (KPIs) to profitability levels, and enhancing data quality through electronic verification mechanisms. Furthermore, it suggests developing analytical capabilities and adopting machine learning techniques to transform analytical reports into executive decisions that support organizational performance and profitability.
Keywords: Business intelligence - Profitability management - Data collection and accuracy - Data analysis - Reporting and decision making.

1. Introduction

Data has become one of the most critical strategic assets for organizations, moving beyond historical records or simple documentation figures. It has transformed into a vital resource and a primary driver for sustainable growth and competitive advantage enhancement. With the proliferation of data generated from operational transactions and daily customer interactions, Business Intelligence (BI) has emerged as an advanced analytical tool capable of transforming raw data into precise strategic insights that support the decision-making process (Sharda, Delen, & Turban, 2020).

BI extends beyond its traditional role of data collection and processing to function as an advanced analytical system. It integrates internal and external data sources, employing advanced analytical tools and visual representations to generate reports and future forecasts. This enables managers to make proactive, evidence-based decisions rather than reactive ones (Loshin, 2021). Through this analytical approach, organizations gain a deeper understanding of market dynamics, predict customer behavior, and optimize operational efficiency, ultimately enhancing profitability and competitive sustainability. In this context, profitability is no longer merely an end result of operational activities but has evolved into a continuous strategic process known as Profitability Management. This process aims to achieve the optimal balance between revenues and costs, ensuring sustainable financial performance and the attainment of long-term objectives (Horngren et al., 2012; Drury, 2018). Profitability Management has witnessed a qualitative evolution with the rise of BI tools, which provide organizations with advanced analytical capabilities to forecast future profitability levels and understand the real-time financial impact of managerial decisions (Shollo & Galliers, 2016). The relationship between BI and Profitability Management is not limited to monitoring; it extends to predictive analysis, enabling managers to evaluate various scenarios and take proactive decisions to ensure profit continuity, sustainable growth, and reduced operational risks. Furthermore, BI applications assist in analyzing product performance, identifying key contributors to profitability, and analyzing customer behavior and preferences to optimize marketing strategies and maximize financial returns (Loshin, 2021).

Despite the pivotal role of BI, organizations face increasing challenges in effectively deploying it, including data fragmentation across multiple sources, issues with data quality and accuracy, and the need for advanced analytical skills capable of interpreting results and translating them into actionable executive decisions (Loshin, 2021; Drury, 2018). Most previous studies treated Business Intelligence as a unidimensional variable (Arnott & Pervan, 2017; Mohammad & Mehdi, 2018), neglecting to analyze the differential impact of each of its stages on Profitability Management. To address this knowledge gap, this study adopts a methodological framework that divides BI into three main dimensions reflecting its complete operational cycle: 1) Data Collection and Accuracy, covering data acquisition mechanisms and ensuring its reliability; 2) Data Analysis, focusing on the use of advanced analytical tools to uncover hidden patterns; and 3) Reporting and Decision Making, representing the final stage where analytical outputs are transformed into intelligent reports that support rapid and effective strategies. By analyzing the structural and differential relationship between these three dimensions and corporate profitability, this study aims to provide a theoretical and practical framework that assists organizations in directing their investments toward the dimension with the greatest impact on achieving sustainable profitability and enhancing operational efficiency, with a focus on the data-intensive telecommunications sector.

2. Literature Review

Companies benefit from business intelligence (BI) systems in their daily operations to analyze economic and market trends in addition to internal operational data such as process efficiency and productivity. Advocates of BI systems believe that they can significantly enhance a company's ability to make informed decisions. BI can be used to analyze product performance and determine which products contribute most to profitability and which should be reassessed or discontinued. It can also be employed to analyze customer behavior, anticipate their needs and preferences, and thereby improve marketing strategies to achieve higher levels of profitability. Furthermore, BI can be utilized to monitor operational costs, enhance production efficiency, and manage inventory. It is also effective in analyzing sales performance, achieving profit targets, and directing marketing efforts more effectively. The relationship between business intelligence and profitability management extends beyond mere monitoring to predictive analysis, where advanced models are used to forecast profitability under different scenarios such as price changes or new market entrants. This enables managers to make proactive decisions that ensure profit continuity and sustainable growth.

Naidoo (2019), conducted a study entitled "The Effects of Business Intelligence Inputs on Decision-Making", aimed to examine the impact of BI information on decision-making culture and to measure the relationship between analytical decision-making culture and the critical success factors of BI systems. These factors included data integration, analytical capabilities, information content quality, accessibility, and the use of information in business processes. The researcher adopted a quantitative analytical method to answer one main research question and measured critical success factors using a predetermined model. Responses were collected from 227 participants who were decision-makers. The study's findings revealed a high degree of data integration, analytical capabilities, and quality of information content, accessibility, and use in business processes. However, the data showed that data integration, analytical capabilities, and information quality were not significantly correlated with an analytical decision-making culture. In contrast, information accessibility and its use in business processes were significantly and positively associated with such a culture. With the rapid growth of business intelligence, managers now face the challenge of making analytical decisions more swiftly. Therefore, this study was not only relevant to practitioners but also provided valuable insights into the critical success factors of BI systems within organizations in the Midwestern United States. It recommended that organizations invest in comprehensive employee training to use BI tools effectively, ensuring that decision-makers can accurately interpret data and leverage insights to make informed decisions. Furthermore, the study suggested that implementing integrated BI systems that consolidate data from various sources can enhance data accessibility and strengthen a data-driven decision-making culture.

Yiu et al. (2020) conducted a study entitled "The Impact of Business Intelligence Systems on Corporate Profitability and Risk." The study aimed to examine how BI systems influence corporate profitability and risk using a sample of 278 manufacturing companies in the United States that implemented BI systems between 2005 and 2014. Employing a descriptive method and multiple regression analysis, the results showed that companies improved their profitability and reduced risk in earnings returns immediately after the operational use of BI systems. The study emphasized the conditions under which manufacturers are most likely to benefit from BI. It found that companies enhanced profitability and reduced risk by strengthening employee relations and institutionalizing business processes. The positive effect of BI on risk reduction was stronger among companies with superior employee relations, suggesting that open communication environments help obtain reliable internal and external data, leading to deeper analytics. Moreover, firms that adopted BI solutions within structured institutional environments demonstrated stronger profitability improvements and lower earnings volatility. Institutionalization created stable procedures and simplified data collection, thus facilitating the integration of BI systems. The study recommended fostering strong internal communication, investing in BI-driven data processes, and institutionalizing operational procedures to maximize the benefits of business intelligence.

Yang et al. (2022) conducted a study titled "The Effect of Business Intelligence, Organizational Learning, and Innovation on the Financial Performance of Innovative Companies in Science Park." The research sought to determine whether the activation of BI, organizational learning (OL), and innovation can improve the financial performance of innovative firms. The study population consisted of innovation-based companies in Science Park employing 400 staff members. Based on the Morgan Table, 196 employees were selected as a statistical sample. A descriptive methodology was adopted, and data were collected through a validated questionnaire. The findings indicated that BI and innovation had a significant and positive effect on firms' financial performance. The application of BI enhanced decision-making efficiency, improved resource utilization, and increased profitability. Conversely, organizational learning did not exhibit a direct or significant effect on financial performance, implying that learning alone is insufficient to generate tangible financial outcomes unless translated into practical innovation and BI utilization. The study recommended that innovative firms actively implement BI systems and employ advanced analytics in daily operations to enhance financial performance. It further emphasized building an organizational culture that promotes innovation and digital transformation, investing in employee training and empowerment, and regularly assessing the effectiveness of the learning environment in supporting innovation and achieving financial goals.

Al-Nouri (2022), conducted a study titled "The Role of Business Intelligence Systems in Supporting Strategic Decision-Making in Governmental Organizations: A Case Study of the Iraqi Ministry of Finance," aimed to evaluate how BI systems contribute to improving strategic decision-making within public institutions. The results confirmed that BI systems play a vital and influential role in supporting strategic decisions by providing accurate and timely information to senior management. They enable leaders to analyze vast amounts of financial and economic data, understand future trends more effectively, and improve operational efficiency and resource allocation while minimizing human error in reporting. The study also revealed that BI enhanced transparency and accountability within the ministry, strengthening trust in strategic decisions. Based on these findings, it recommended that governmental institutions in Iraq adopt BI systems as an integral part of their strategic frameworks, promote a data-driven organizational culture, and offer continuous employee training. Moreover, the study stressed the importance of ongoing technical support and system integration to ensure that strategic decisions are grounded in analytical insights rather than intuition.

Jöhnk and Wessel (2022) carried out a study titled "Business Intelligence Capabilities and Their Impact on Organizational Resilience: A Case Study in the Retail Sector." This study explored the relationship between BI capabilities and organizational resilience, focusing on the retail industry. It aimed to understand how retail companies can leverage BI tools to adapt to rapid market changes, such as shifting customer preferences, new competitors, and supply chain disruptions. The findings showed a strong positive correlation between BI capabilities and organizational resilience. Companies that employed real-time data analytics were better able to respond to sudden changes in demand and supply. BI technologies enabled managers to make faster, data-informed decisions, which improved overall performance. Organizations with advanced BI capabilities were also better at predicting future market trends and adjusting their strategies accordingly, giving them a competitive advantage. The study recommended that retail companies invest in advanced BI tools that offer in-depth analytics, integrate BI into daily operations such as inventory management and customer behavior analysis, and foster a data-driven culture supported by continuous employee training.

Khare et al. (2023) investigated "The Impact of Business Intelligence on Company Performance: A System Dynamics Approach." The study developed a system dynamics model to assess whether a Japanese printed circuit board (PCB) manufacturing company should invest in BI to improve operations based on data processing rates, which in turn enhance financial performance. Using a descriptive analytical method, the study found that adopting BI had a positive impact on net profit, accumulated earnings, production costs, revenues, and the number of units produced. Increasing the data processing rate from 10% to 40% raised net profit by 25.77% and accumulated earnings by 48.28%. Revenues grew by 7.3%, and production volume by 9.37%. Meanwhile, production costs declined by 25%. Although the decrease in costs was relatively modest compared to the substantial revenue gains, the results underscored BI's potential to boost profitability and efficiency. The study recommended using simulation models to optimize performance parameters and suggested applying the methodology to non-manufacturing industries such as services, media, and education. It concluded that in the era of digital transformation, BI represents a highly promising managerial tool with proven success in both manufacturing and service organizations.
Al-Zoubi and Abu Al-Heija (2023) conducted a field study titled "The Impact of Business Intelligence Systems on Earnings Quality: Evidence from Jordanian Industrial Companies." The research examined the relationship between BI system usage and earnings quality, focusing on how system characteristics—such as data accuracy and integration—affect earnings transparency and stability. The results revealed a strong positive correlation between BI usage and earnings quality: companies using BI systems demonstrated more stable and transparent profits. The study highlighted that accurate and integrated data play a crucial role in enhancing earnings quality by providing reliable analytics that guide managerial decisions and reduce the need for earnings manipulation. BI implementation was found to limit earnings management practices by providing real-time and reliable data, thus reducing the incentive for executives to distort financial outcomes. The study recommended investing in advanced BI systems that ensure data precision and integration, providing continuous employee training, and adopting BI as a tool to promote financial transparency and strengthen investor confidence.
Al-Masri and Shaheen (2024) carried out a study titled "The Impact of Business Intelligence Usage on the Marketing Performance of Small and Medium Enterprises: An Applied Study in the Jordanian E-Commerce Sector." The research aimed to assess how BI applications influence marketing performance in SMEs. The findings confirmed a statistically significant positive relationship between BI adoption and marketing performance improvement. Companies leveraging BI tools demonstrated a stronger ability to understand customer preferences, design targeted marketing campaigns, and achieved higher sales, customer satisfaction, and operational efficiency. The study recommended adopting BI as a strategic tool for SMEs, utilizing available data to analyze customer and competitor behaviors, and training marketing teams to transform data into actionable insights that enhance decision-making and market share.

2.1.1 Independent Variable: Business Intelligence (BI)

Business Intelligence (BI) is defined as a set of tools, techniques, and processes aimed at collecting, analyzing, and transforming data into valuable information to support strategic decision-making (Sohollo, 2011; O'Brien & Marakas, 2011). BI functions as an integrated information system that seeks to "investigate, logically integrate, and analyze data from various sources" (Sharda, Delen, & Turban, 2020), enabling managers to access "accurate and timely reports" (Loshin, 2021). For the purpose of this study, BI is divided into three principal dimensions reflecting its complete operational cycle: Data Collection and Accuracy, which includes mechanisms for acquiring data from internal and external sources and ensuring its reliability and integrity, forming the basis for any subsequent analytical insight. Data Analysis focuses on utilizing advanced analytical tools, such as prescriptive and predictive models, to uncover hidden patterns and trends, thereby enhancing the accuracy of choices and mitigating risks. Finally, Reporting and Decision Making represents the stage where analytical insights are transformed into simplified and effective reports, facilitating sound and rapid strategic decision-making by leaders to achieve organizational objectives.

2.1.2 Dependent Variable: Profitability Management

Profitability Management is defined as the process of analyzing financial data and identifying factors influencing profitability, with the goal of making strategic decisions to improve financial performance, control costs, and maximize revenue (Drury, 2018). Effective Profitability Management is not limited to tracking historical figures; it extends to proactive planning and deep analysis of production, sales, marketing costs, and inventory management. The utilization of BI reports and analytics is considered a powerful tool in this domain, enabling managers to "identify patterns and trends in financial data," which ultimately leads to "enhanced profitability and reduced company risk" (Loshin, 2021).

2.2. Review of previous studies and research gap identification

Previous studies addressing the topic of Business Intelligence (BI) have demonstrated a clear and consistent impact of this concept on enhancing organizational performance, improving operational efficiency, and supporting decision-making across various sectors. This is evident in the studies conducted by Al-Nouri (2022), Al-Zoubi and Abu Al-Heija (2023), Jöhnk and Wessel (2022), and Al-Masri and Shahin (2024), which indicate that the implementation of BI systems contributes to higher productivity and profitability by improving data quality and enabling analytical capabilities that support sound financial forecasting and risk reduction. Other studies, such as those by Naidoo (2019) and Yang et al. (2022), further highlight that the effectiveness of BI depends largely on organizational culture and the extent to which data-driven and analytical decision-making approaches are adopted, emphasizing that BI achieves its greatest impact when integrated with innovation, organizational learning, and strategic flexibility. Although prior research has provided substantial evidence on the role of BI in enhancing organizational performance and supporting decision-making and innovation, a critical gap remains in the current body of knowledge. Most existing studies have focused on broad organizational outcomes—such as productivity, financial performance, and strategic flexibility—without offering a detailed explanation of the mechanisms through which BI directly influences profitability management. Furthermore, previous research has not sufficiently examined the mediating and enabling factors that shape the BI–profitability relationship, such as data quality, system integration, analytical capability, and the maturity of data-driven decision-making cultures. These factors are essential for understanding why BI succeeds in some organizational contexts while producing limited impact in others. In addition, empirical evidence from Arab business environments remains limited, despite the increasing adoption of BI systems. Existing regional studies have primarily addressed decision-making and performance improvement in general terms, with little focus on how BI contributes specifically to profit planning, cost control, identification of profit centers, and predictive financial analytics. Therefore, despite the growing emphasis on BI as a strategic tool, literature still lacks a comprehensive model that integrates advanced BI functionalities with profitability management practices in a way that reflects the operational realities of contemporary organizations, particularly within developing economies. Addressing this gap is essential for understanding how BI can be leveraged not only to monitor financial outcomes but also to shape proactive and data-driven strategies that enhance sustainable profitability.

2.3 Hypothesis development and conceptual framework

Based on the theoretical grounding that asserts Business Intelligence (BI) as a powerful tool for profitability management—primarily through enhancing information collection, improving analytical processes, and facilitating strategic decision-making (Loshin, 2021; Sharda et al., 2020)—and drawing on empirical evidence confirming the positive association between BI adoption and financial performance (Khare et al., 2023; Yiu et al., 2020), the study hypotheses are formulated to examine the extent to which this impact applies at both the overall level and across the sub-dimensions of BI.

1. Research Hypotheses

Considering the theoretical analysis and empirical evidence, the study aims to test the effect of BI dimensions on profitability management:

Main Hypothesis (H1): There is a statistically significant effect of Business Intelligence on profitability management contributing to corporate success.

2. Business Intelligence and Profitability Management: An Integrative Relationship Supporting Strategic Decision-Making and Financial Performance

Amid the digital revolution and the rapid expansion of data volumes and market complexity, Business Intelligence has emerged in the twenty-first century as one of the most influential strategic tools for supporting managerial decisions and enhancing financial performance. BI is defined as an integrated technological system comprising tools and techniques for collecting, storing, analyzing, and visually presenting data in a manner that enables managers to make timely and accurate decisions. These tools include data warehouses, online analytical processing (OLAP), and data-mining techniques (Kouda & Saidi, 2023). The overarching purpose of BI is to improve organizational performance, increase operational efficiency, and strengthen competitive advantage by transforming raw data into actionable knowledge. Its significance lies in enabling organizations to understand relationships among facts and figures in ways that support profitability objectives—such as improving marketing operations, optimizing resource management, and identifying growth opportunities (Saidi et al., 2023). Profitability, on the other hand, is the most prominent indicator of organizational success and sustainability, reflecting a firm's ability to generate returns and create value for stakeholders. Profitability management encompasses a set of financial strategies and processes aimed at maximizing returns, reducing costs, and achieving optimal financial balance (Jiasinghani, 2015). Effective profitability management enhances operational efficiency, informs investment decisions, and strengthens the confidence of investors and creditors (Navaratne & Oyakhilome, 2023). However, profit management practices may occasionally give rise to earnings management, which involves deliberately manipulating financial reporting to achieve desired outcomes—a challenge highlighted by Saqr (2016), who noted its ethical and accounting implications on the credibility of financial information.

The relationship between BI and profitability management is inherently integrative, as BI represents the analytical engine that provides profitability management with timely, accurate, and predictive information required for sound financial decisions. The effectiveness of BI systems rests on three core dimensions, each of which plays a vital role in supporting profitability management:

1- Data Collection and Accuracy: This dimension forms the foundation upon which analytical processes are built. Data are collected from internal operational systems and external market sources. High accuracy minimizes erroneous decisions and enhances financial forecasting, supporting sustainable profit generation (Choughri & Soubjaki, 2017).
2- Data Analysis:Advanced analytical techniques are used to extract patterns, market trends, and customer profitability insights. Such capabilities help restructure marketing and pricing strategies. Predictive analytics contribute to estimating future demand, reducing excess inventory, and lowering costs (Adesina et al., 2024).
3- Reporting and Decision-Making: This stage represents the culmination of analytical outputs, where results are visualized through dashboards and performance scorecards. These tools allow managers to monitor financial performance indicators and respond proactively to market changes (Kaawaase et al., 2021).

Thus, the relationship between BI and profitability management is a positive causal relationship: BI supports profitability management by providing accurate data, real-time analytics, and financial forecasts that help maximize revenues and minimize expenses. In turn, profitability management capitalizes on these outputs to formulate more flexible and proactive financial strategies, ensuring financial sustainability and strengthening an organization's ability to compete in dynamic market environments.

3. Research Methodology

A. Research Method and Design, the study adopts a descriptive-analytical approach to explore the phenomenon as it exists in reality, analyze the relationships among variables, and interpret them to derive conclusions. A field survey design was employed, using an electronic questionnaire as the primary tool for collecting primary data, ensuring efficient access and clarification of study objectives to respondents.

B. Research Population and Sample, Population: The research population comprises all employees working in telecommunications companies in Egypt, estimated at more than 100,000 individuals. Given its large size, the population is treated as infinite. Sample Size: Based on standard statistical methodologies for large populations (e.g., Cochran's formula), the minimum required sample size was determined to be 385 respondents, ensuring a 95% confidence level. Practical Procedure: To ensure adequate representation, 1,000 electronic questionnaires were distributed, significantly exceeding the minimum required sample size.

C. Research Variables and Measurement Scales, the research instrument—an electronic questionnaire—was developed based on an extensive and rigorous review of prior literature, and was structured to reflect the two primary variables of the study. The first variable, Business Intelligence (BI)**,** was measured using 17 items distributed across three core dimensions: Data Collection and Accuracy (6 items), Data Analysis (5 items), and Reporting and Decision-Making (6 items). The second part of the instrument measured the dependent variable, Profitability Management**,** which consisted of 15 items equally divided into three dimensions: Customer Monitoring and Behavior Analysis (5 items), Market Analysis and Trend Forecasting (5 items), and Strategic Orientation and Decision-Making (5 items). This structure ensured comprehensive coverage of the constructs under investigation, enabling robust measurement of the relationships between BI dimensions and profitability management practices.

D. Statistical Analysis Procedures, to achieve the study objectives and test the proposed hypotheses, a set of advanced statistical techniques was employed using SPSS. Descriptive statistics were first applied to calculate key measures of central tendency and dispersion, including the mean, standard deviation, and coefficient of variation. Confirmatory Factor Analysis (CFA) was then conducted to assess the extent to which the proposed dimensional structure of the study variables aligned with the collected data. The primary analytical technique used for hypothesis testing was Structural Equation Modeling (SEM), which enabled the evaluation of the differential effects of each Business Intelligence dimension on profitability management within a unified and comprehensive model. Additionally, validity and reliability analyses were performed using Cronbach's Alpha and Composite Reliability to ensure the internal consistency and measurement accuracy of the study constructs.

E. Instrument Validity and Reliability

Table 1. Reliability and Validity Coefficients for the Study Dimensions

Dimensions	Number of Items	Reliability Coefficient	Validity Coefficient
Independent variable (Business Intelligence)			
Data Collection and accuracy	6	0.94	0.97
Data analysis	5	0.89	0.95
Reporting and decision-making	6	0.91	0.95
Overall	17	0.96	0.98
Dependent variable (Profitability Management)			
Customer monitoring and behavioral analysis	5	0.86	0.93
Market analysis and trend forecasting	5	0.89	0.94
Strategy management and decision-making	5	0.89	0.94
Overall	15	0.95	0.98

Source: Prepared by the researcher based on SPSS outputs.

The reliability and validity analysis for the independent variable, Business Intelligence, indicated high internal consistency and validity across its three dimensions. Specifically, the reliability coefficients ranged from 0.89 for data analysis to 0.94 for data collection and accuracy, with an overall reliability of 0.96 for the full 17-items. Validity coefficients were also strong, ranging from 0.95 for data analysis and reporting and decision-making to 0.97 for data collection and accuracy, with an overall validity coefficient of 0.98, demonstrating that the instrument accurately measures the intended construct of Business Intelligence.

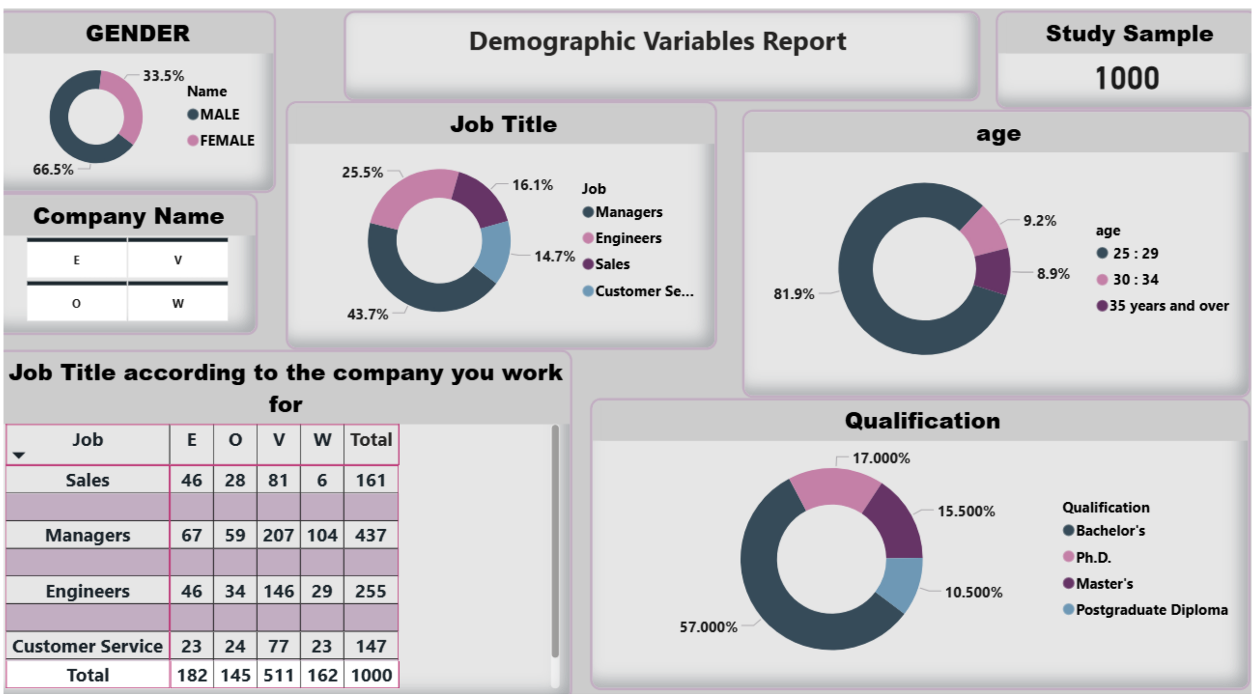
Similarly, the dependent variable, Profitability Management, exhibited high reliability and validity across its three dimensions. Reliability coefficients ranged from 0.86 for customer monitoring and behavioral analysis to 0.89 for both market analysis and trend forecasting and strategy management and decision-making, with an overall reliability of 0.95 for the 15-item scale. Validity coefficients ranged from 0.93 for customer monitoring and behavioral analysis to 0.94 for the other two dimensions, with an overall validity coefficient of 0.98. These results indicate that the scale for Profitability Management is both consistent and valid in capturing the key dimensions of monitoring customers, analyzing market trends, and guiding strategic decisions.

4. Descriptive analysis of the study variables

A. Descriptive Analysis of the Demographic Variables

The demographic characteristics of the workforce provide a foundational basis for understanding the organizational environment, managerial practices, and human resource dynamics within any institution. This section presents a comprehensive analysis of the demographic variables included in the study, including gender, age group, educational qualification, and career path. In addition to offering an overall description of the study population, the analysis provides a detailed, comparative view of these characteristics across the four companies represented in the sample: (E), (O), (V), and (W). The accompanying charts and descriptive reports aim to illustrate and characterize the distribution of the sample, highlighting both variations and similarities in administrative, age, and educational structures among the four companies. Such an accurate and granular description helps to elucidate the key human factors that may influence organizational performance and the responsiveness of each company, thereby establishing a solid foundation for subsequent analyses related to the study.

Figure (1). Descriptive report of the demographic variables of the sample



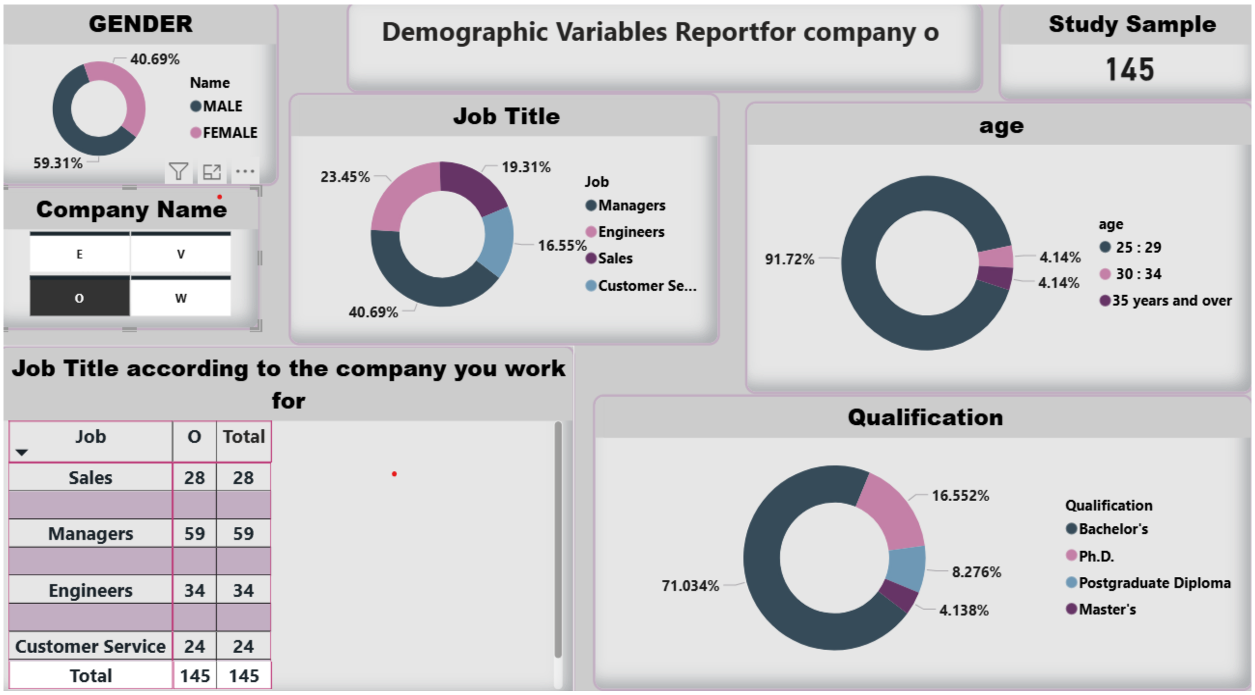
Job	E	O	V	W	Total
Sales	46	28	81	6	161
Managers	67	59	207	104	437
Engineers	46	34	146	29	255
Customer Service	23	24	77	23	147
Total	182	145	511	162	1000

Source: Prepared by the researcher based on power Bi outputs.

The study sample comprised 1,000 participants, with demographic analysis revealing several key trends. Regarding educational attainment, most respondents (57%) held a master's degree. In terms of gender distribution, males constituted the largest participants, accounting for 66.5% of the total sample. As for age distribution, participants aged 35 and above represented the predominant group at 81.9%. Analysis of professional roles indicated that managers made up 43.7% of the sample, followed by engineers at 25.5%, reflecting representation of both leadership and specialized technical levels. Furthermore, over half of the respondents (51.1%) were employees of Company

V, suggesting that this organization demonstrated the highest response rate among the surveyed entities."

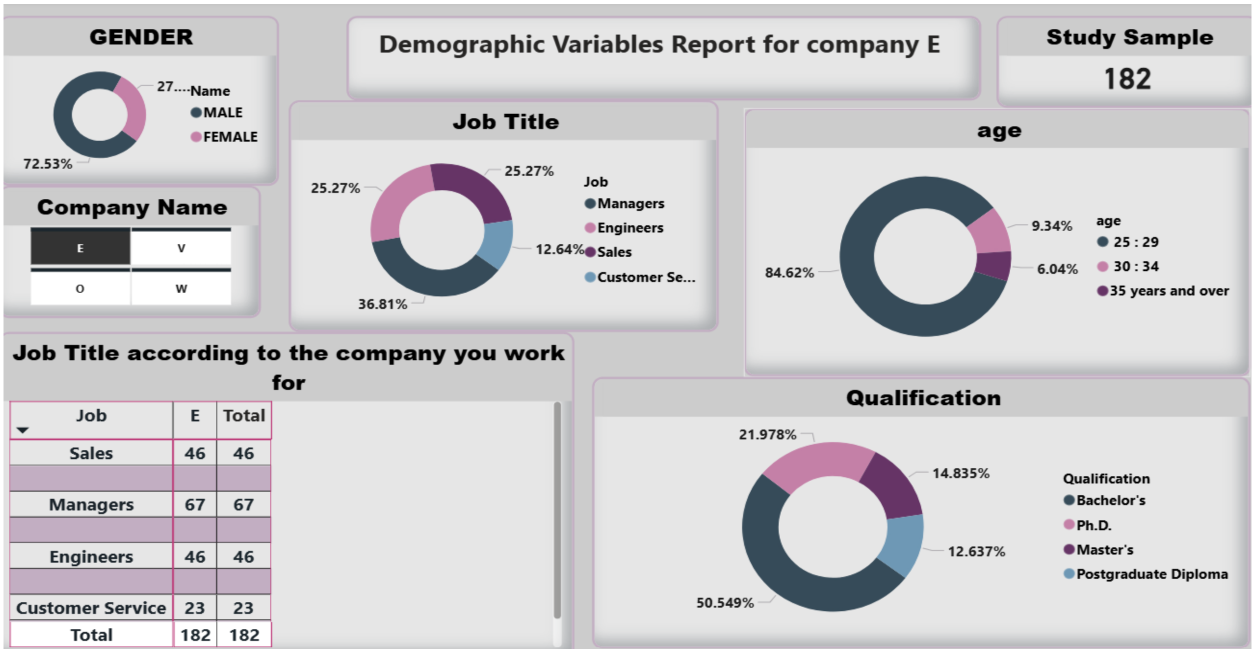
Figure (2): Descriptive report of the demographic variables for the sample of company (O)



Source: Prepared by the researcher based on power Bi outputs.

"For Company O, the study results indicate that the research sample consists of 145 participants. Regarding gender distribution, males account for 59.31%, compared to 40.69% for females. In terms of age groups, the findings reveal that most of the sample (91.72%) falls within the 25–29 age interval, while those aged 30–34 and 35 and above each represent approximately 4.14%. As for educational attainment, the results show that bachelor's degree holders constitute the largest participants (71.03%), followed by Ph.D. holders (16.55%), Postgraduate Diploma holders (8.27%), and finally, master's degree holders (4.13%). Furthermore, data regarding job titles clarify that the managerial category represents the highest proportion at 40.69%, followed by engineers at 23.45%, sales staff at 19.31%, and customer service employees at 16.55%. Consequently, the sample characteristics provide an appropriate representation of the occupational, age, and educational categories relevant to the research topic."

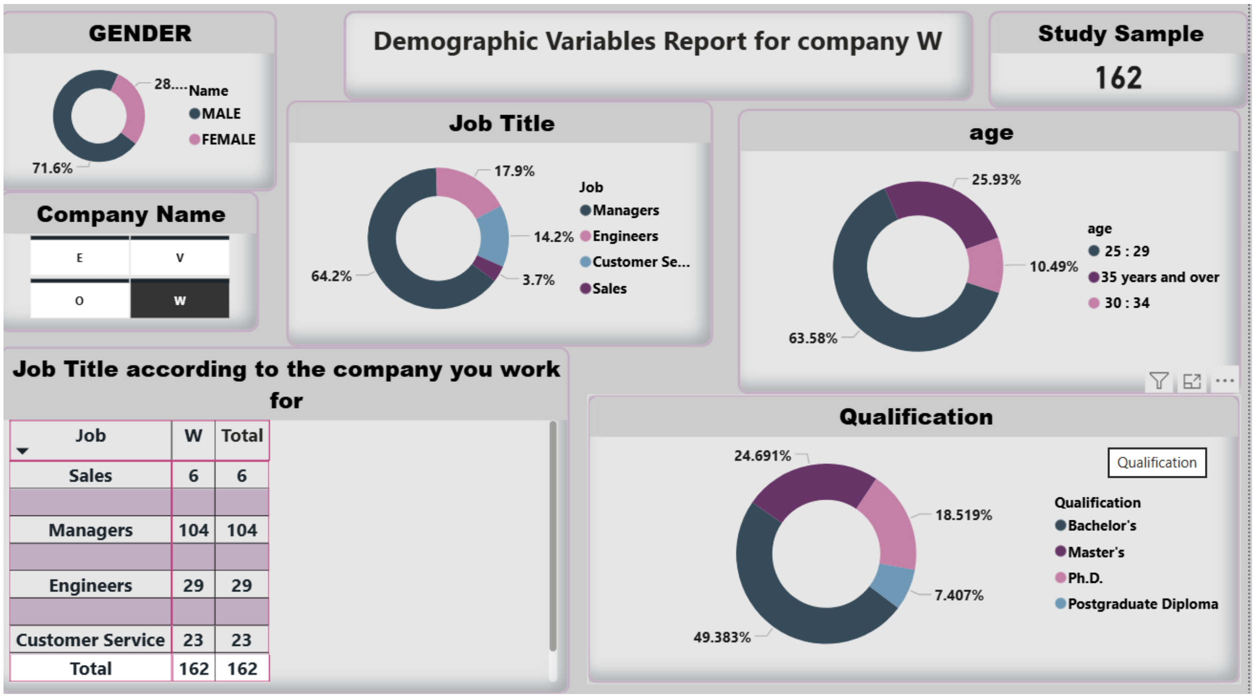
Figure (3): Descriptive report of the demographic variables for the sample company (E)



Source: Prepared by the researcher based on power Bi outputs.

"Regarding Company E, the results indicate that the research sample consists of 182 participants. Findings show that males represent the largest participants of the sample at 72.53%, compared to 27.47% for females. In terms of age distribution, the results reveal that most employees fall within the 25–29 age interval, accounting for 84.62%. As for educational attainment, the data indicates that bachelor's degree holders constitute 50.54%, followed by Ph.D. holders at 21.978%, reflecting a high educational standard within the company. Furthermore, the report clarifies that in terms of job titles, the managerial category ranks first at 36.81%, followed by engineers at 25.27%."

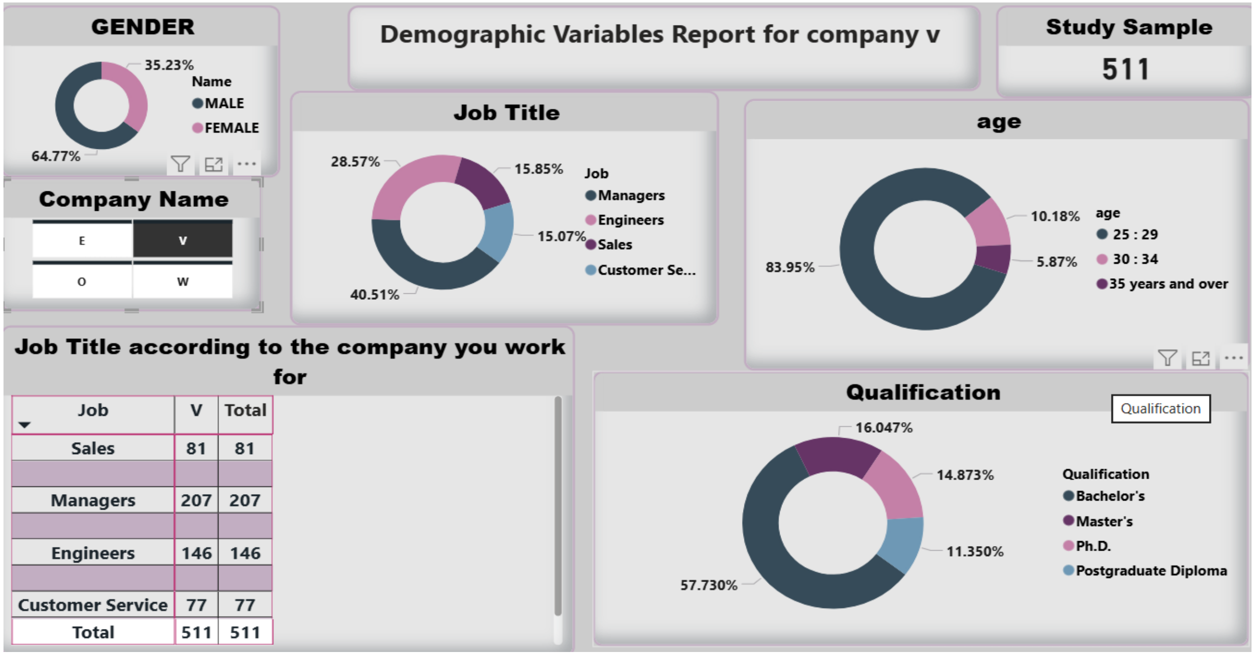
Figure (4): Descriptive report of the demographic variables for the sample company (W)



Source: Prepared by the researcher based on power Bi outputs.

"Regarding Company W, the results indicate that the research sample consists of 162 participants. The findings demonstrate that males represent the largest proportion of the sample at 71.6%, compared to 28.4% for females. Furthermore, the results show that most of the respondents fall within the 25–29 age group at 63.58%, while those aged 35 and above account for approximately 25.93%. In terms of educational attainment, it was found that most employees hold a bachelor's degree at 49.383%, followed by master's degree holders at 24.691%. Regarding job titles, the data reveals that the managerial category represents the highest percentage at 64.2%, followed by engineers at 17.9%."

Figure (5): Descriptive report of the demographic variables for the sample company (V)



Source: Prepared by the researcher based on power Bi outputs.

"Regarding Company V, the results indicate that the research sample consists of 511 participants. In terms of gender distribution, the findings reveal that males represent the largest proportion of employees at 64.77%, compared to 35.23% for females. Regarding age groups, the results clarify that most of the sample falls within the 25–29 age bracket at 83.95%, while the 30–34 age group accounts for 10.1%, and those aged 35 and above represent approximately 5.87%. As for educational attainment, the results show that bachelor's degree holders constitute most of the sample at 57.73%, followed by master's degree holders at 16.047%. Furthermore, regarding job titles, the data indicates that the managerial category is the most predominant at 40.51%, followed by the engineer's category at 28.57%."

B. Descriptive analysis of the independent variable (Business Intelligence) and its dimensions

The descriptive statistics for the independent variable, Business Intelligence, are summarized in Table 2, which shows the mean, standard deviation, and overall trend for the sample according to its three dimensions: data collection and accuracy, data analysis, and reporting and decision-making.

Table 2. Mean, standard deviation, and direction for Business Intelligence dimensions

Dimension	No. of Items	Mean	Standard Deviation	Direction
Data Collection and accuracy	6	3.95	1.16	Agree
Data analysis	5	3.91	1.102	Agree
Reporting and decision-making	6	3.87	1.155	Agree
Overall Mean	17	3.91	1.139	Agree

Source: Prepared by the researcher based on SPSS outputs.

The results show that participants generally agreed on the importance of Business Intelligence, with mean scores ranging from 3.87 to 3.95. The highest-rated dimension was data collection and accuracy (mean = 3.95), emphasizing the critical role of accurate and high-quality data in enabling effective decision-making. Data analysis followed (mean = 3.91), and reporting and decision-making was third (mean = 3.87), reflecting awareness of the sequential process of handling data from collection to analysis to decision-making. The standard deviations for the Business Intelligence dimensions ranged from 1.102 to 1.16, indicating a high level of consistency in participants' responses. Specifically, data collection and accuracy had a standard deviation of 1.16, data analysis 1.102, and reporting and decision-making 1.155. The overall standard deviation was 1.139, suggesting that participants' opinions were relatively close and stable, supporting the reliability of the findings and confirming consensus on the importance of these three Business Intelligence components in enhancing organizational performance and profitability management.

C. Descriptive Analysis of the Dependent Variable (Profitability Management) and Its Dimensions

The descriptive statistics for the dependent variable, Profitability Management, are presented in Table 3, based on its three dimensions: customer monitoring and behavior analysis, market analysis and trend forecasting, and strategy guidance and decision-making.

Table 3. Mean, standard deviation, and direction for Profitability Management dimensions

Dimension	No. of Items	Mean	Standard deviation	Direction
Customer Monitoring and behavioral analysis	5	3.63	1.17	Agree
Market analysis and trend forecasting	5	3.79	1.125	Agree
Strategy management and Decision-Making	5	3.76	1.132	Agree
Overall Mean	15	3.73	1.142	Agree

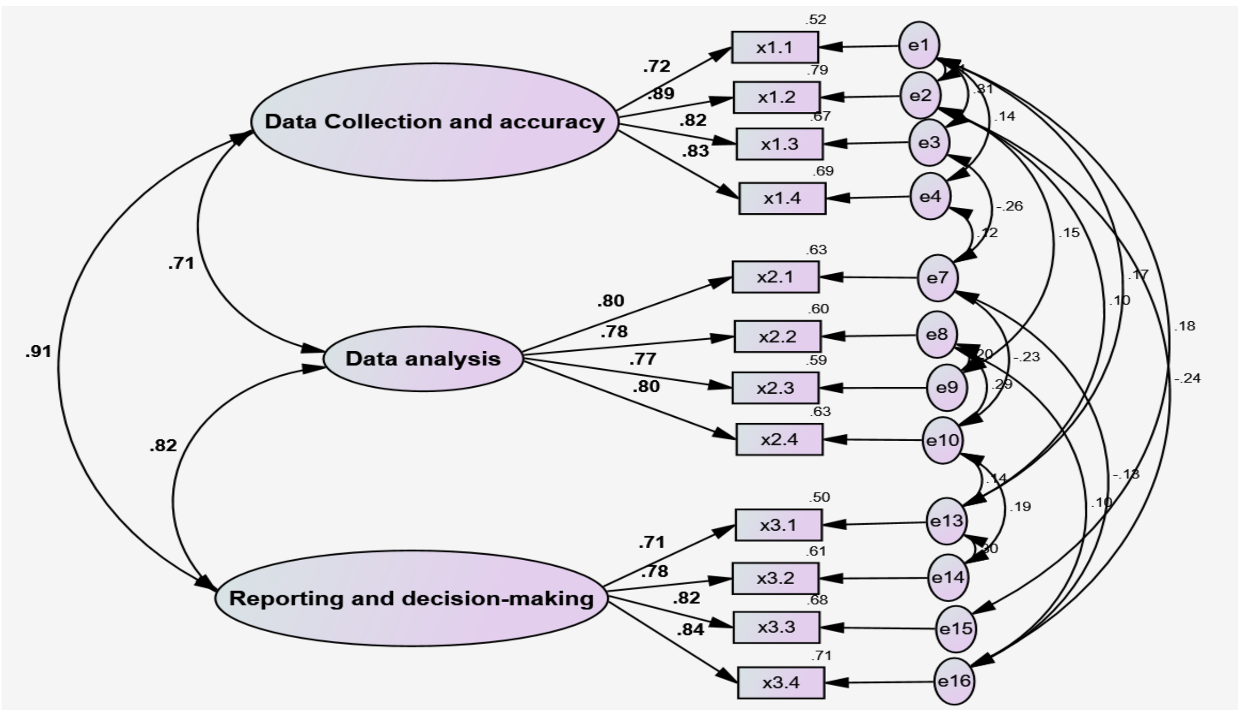
Source: Prepared by the researcher based on SPSS outputs.

The results indicate that participants generally agreed on the importance of Profitability Management, with mean scores ranging from 3.63 to 3.79. The highest-rated dimension was market analysis and trend forecasting (mean = 3.79). For, strategy management and decision-making followed closely (mean = 3.76), and customer monitoring and behavioral analysis was third (mean = 3.63), reflecting participants' recognition of the sequential importance of monitoring customers, analyzing market data, and guiding strategic actions. The standard deviations for the Profitability Management dimensions ranged from 1.125 to 1.17, indicating a high level of consistency in responses. Specifically, market analysis and trend forecasting had a standard deviation of 1.125, strategy management and decision-making 1.132, and customer monitoring and behavioral analysis 1.17. The overall standard deviation was 1.142, suggesting that participants' opinions were closely aligned, supporting the reliability of the results and confirming broad agreement on the importance of these dimensions in enhancing operational efficiency and sustaining corporate profitability.

4.1Confirmatory factor analysis of Business Intelligence

A confirmatory factor analysis (CFA) was conducted using AMOS for the Business Intelligence dimensions: data collection and accuracy, data analysis, and reporting and decision-making. CFA was applied to test hypotheses concerning the relationships between Business Intelligence dimensions and their underlying factors. It also evaluated the model's fit in representing the dataset and enabled comparison among alternative factor models. The following Figure illustrates the CFA results for the Business Intelligence construction.

Figure (6): Confirmatory factor analysis (CFA) of Business Intelligence



Source: Prepared by the researcher based on AMOS statistical analysis results.

The figure above presents the model quality indicators, which reflect the degree of influence of the construction of Business Intelligence on its observed items. Specifically, the standardized loading value (regression weight) on each arrow, pointing from the construct to its respective item, signifies the extent to which that item represents or measures the underlying construct. The main results of the model fit indices for the proposed Business Intelligence construct are subsequently summarized in the table below.

Table 4. Model fit measures for Business Intelligence

Measure	Estimated value
CMIN	88.336
DF	33

Measure	Estimated value
CMIN/DF	2.677
GFI	0.985
CFI	0.994
RMR	0.019
TLI	0.987
RMSEA	0.041

Source: Prepared by the researcher based on AMOS statistical analysis results.

The results from the table above can be summarized as follows:

1- The CMIN/DF ratio was 2.677. According to scholars, values below 3 indicate a good model fit, while values ranging between 3 and 5 are considered acceptable.
2- The Goodness of Fit Index (GFI) was 0.985. Since this index ranges from 0 to 1, values closer to 1 indicate an excellent model fit.
3- The Comparative Fit Index (CFI) was 0.994, and as this index also ranges between 0 and 1, values approaching 1 suggest an excellent fit.
4- The Root Mean Square Residual (RMR) was 0.019. Lower values indicate better fit, and values approaching zero represent an ideal model fit.
5- The Tucker-Lewis Index (TLI) was 0.987. The TLI ranges from 0 to 1, with values near 1 indicating a very good model fit.
6- The Root Mean Square Error of Approximation (RMSEA) was 0.041. Values below 0.05 indicate an excellent fit, values between 0.05 and 0.08 are acceptable, and values above 0.10 are considered unacceptable.

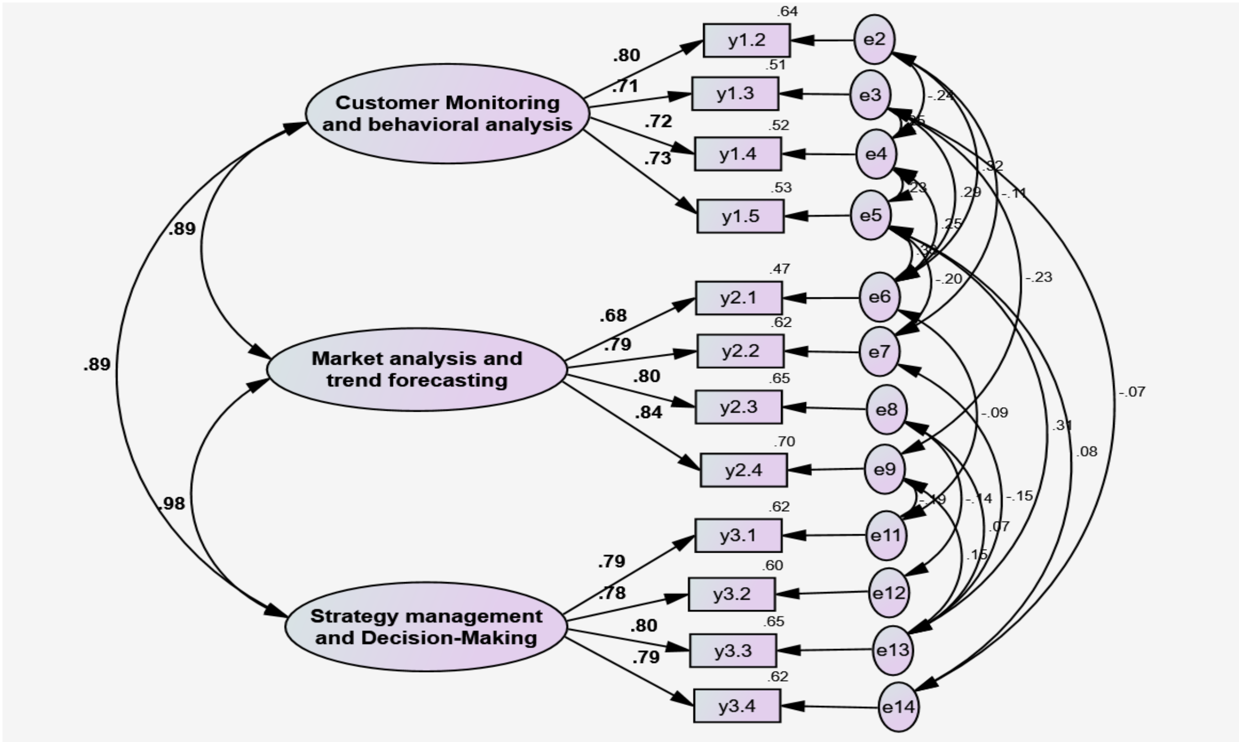
Overall, the model fit indices achieved the required and acceptable levels, confirming that the items of Business Intelligence are strongly related to their underlying latent factors.

4.2 Confirmatory factor analysis of Profitability Management

AMOS was also used to perform CFA for the dependent variable, Profitability Management, including its dimensions: Customer Monitoring and Behavioral Analysis, Market Analysis and Trend Forecasting, and Strategy Guidance and Decision-Making. CFA was employed to test the hypothesized relationships between these dimensions and their latent factors, assess the model's representation of the dataset, and compare alternative factor models.

The following figure illustrates the CFA results for Profitability Management.

Figure 7. Confirmatory factor analysis of Profitability Management dimensions



Source: Prepared by the researcher based on AMOS statistical analysis results.

From the above figure, the model quality indicators can be inferred, representing the degree of influence of the Profitability Management construction on each of its observed items. Each value on the arrows pointing from the construction to its respective item reflects the extent to which the construction is represented by that item. The main results of the model fit indices for the proposed Profitability Management construction are summarized in Table 5.

Table 5. Model fit measures for Profitability Management

Measure	Estimated value
CMIN	88.949
DF	33
CMIN/DF	2.780
GFI	0.986
CFI	0.993
RMR	0.020
TLI	0.985
RMSEA	0.042

Source: Prepared by the researcher based on AMOS statistical analysis results.

The results from the table above can be summarized as follows:

1. The CMIN/DF ratio was 2.780. According to scholars, values below 3 indicate a good model fit, while values between 3 and 5 are considered acceptable.
2. The Goodness of Fit Index (GFI) was 0.986. Since this index ranges from 0 to 1, values closer to 1 indicate an excellent model fit.

3. The Comparative Fit Index (CFI) was 0.993, and as this index also ranges between 0 and 1, values approaching 1 indicate very good fit.
4. The Root Mean Square Residual (RMR) was 0.020. Lower values indicate better fit, and values approaching zero represent an ideal model fit.
5. The Tucker-Lewis Index (TLI) was 0.985. The TLI ranges from 0 to 1, with values near 1 indicating a very good model fit.
6. The Root Mean Square Error of Approximation (RMSEA) was 0.042. Values below 0.05 indicate excellent fit; values between 0.05 and 0.08 are acceptable, while values above 0.10 are considered unacceptable.
7. Overall, the model fit indices achieved the desired and acceptable levels, confirming that the items of Profitability Management are strongly associated with their underlying latent factors.

Main Hypothesis, H1: There is a statistically significant relationship between Business Intelligence and Profitability Management in achieving corporate success.

Structural Equations of the Proposed Model Examining the Impact of Business Intelligence, represented by Data Collection and Accuracy, Data Analysis, and Reporting and Decision-Making—on Profitability Management, represented by Customer Monitoring and Behavioral Analysis, Market Analysis and Trend Forecasting, and Strategy Orientation and Decision-Making

Table (6). Structural equation estimates for the proposed Business Intelligence model

Path	Unstandardized Estimates β_i	Standardized Estimates β_i	S.E.	C.R.	P-value
Data Collection and Accuracy ← Profitability Management	0.29	0.356	0.022	13.352	***
Data Analysis ← Profitability Management	0.175	0.2	0.02	8.607	***
Reporting and Decision-Making ← Profitability Management	0.382	0.451	0.025	15.556	***
Profitability Management ← Customer Monitoring and Behavioral Analysis	0.944	0.831	0.024	38.713	***
Profitability Management ← Market Analysis and Trend Forecasting	1	0.893	—	—	—
Profitability Management ← Strategy Management and Decision-Making	1	0.867	—	—	—

Source: Prepared by the researcher based on AMOS statistical analysis outputs.

The results indicate that all independent variables (data Collection and accuracy, data analysis, and reporting and decision-making) have a positive and statistically significant effect on Profitability Management.

As for data collection and accuracy, comparing p-value with significance level the results show that p-value is less than significance level (alpha=0.05). The standardized coefficient (β = 0.356) shows a positive relationship with profitability management.

As for data analysis, comparing p-value with significance level the results show that p-value is less than significance level (alpha=0.05). The standardized coefficient (β = 0.2) shows a positive relationship with profitability management.

As for reporting and decision-making, comparing p-value with significance level the results show that p-value is less than significance level (alpha=0.05). The standardized coefficient (β = 0.451) shows a positive relationship with profitability management.

Table (7). Coefficient of determination (R^2) for the proposed model

Dependent variable	R^2
Profitability Management	0.806
Customer Monitoring and Behavioral Analysis	0.69
Market Analysis and Trend Forecasting	0.797
Strategy Management and Decision-Making	0.752

Source: Prepared by the researcher based on AMOS statistical analysis outputs.

The table presents the coefficient of determination (R^2) for the dependent variables in the structural model. R^2 indicates the proportion of variance in each dependent variable that is explained by its corresponding independent predictors, reflecting the model's explanatory power.

As for, profitability management (R^2 = 0.806), this value shows that 80.6% of the variance in Profitability Management is explained by the three Business Intelligence dimensions (Data Collection and Accuracy, Data Analysis, and Reporting and Decision-Making). This demonstrates a strong explanatory capability of the model.

As for, customer monitoring and behavioral Analysis (R^2 = 0.690), profitability management explains 69% of the variance in this dimension, indicating a substantial causal relationship between profitability practices and customer-related analytics within the firm.

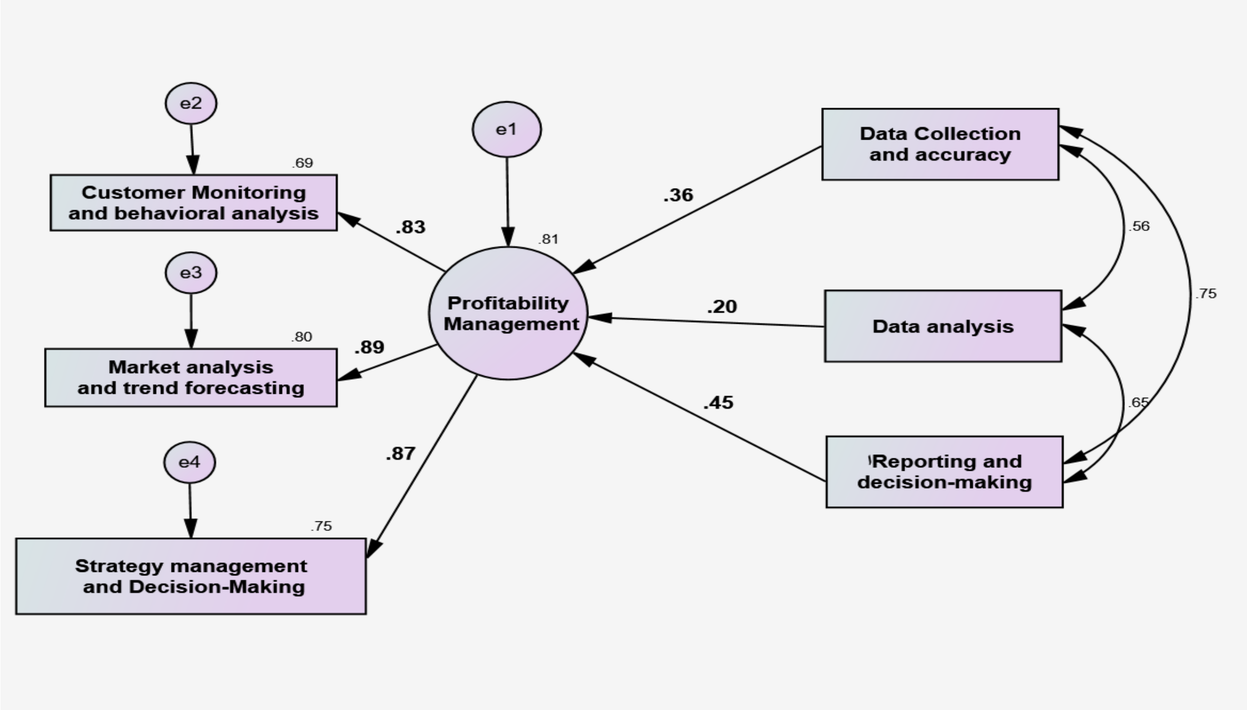
As for, Strategy Management and Decision-Making (R^2 = 0.752), the results show that 75.2% of the variance in strategic orientation and decision-making is attributable to Profitability Management, confirming its significant role in guiding corporate strategy.

As for, Market Analysis and Trend Forecasting (R^2 = 0.797), profitability management explains 79.7% of the variance in this dimension—the highest among the dependent constructs. This suggests that effective profitability management plays a central role in shaping a firm's market analysis and forecasting capabilities.

Overall, these findings affirm the robustness and high explanatory power of the proposed structural model. They also highlight the strong influence of Profitability Management on its sub-dimensions, demonstrating the model's validity in explaining the relationship between Business Intelligence and profitability-related outcomes.

The following figure presents the estimated model

Figure (8) Modeling the structural equations of the business intelligence model on profitability management



Source: Prepared by the researcher based on AMOS statistical analysis outputs.

The figure illustrates the model's quality indicators, specifically the degree of influence or loading of each construct on its corresponding observed items. Each value displayed on the directional arrows linking a construct to its indicators represents the factor loading, reflecting the extent to which each item contributes to measuring that construct.

Table (8). Model Fit Indices

Measure	Estimated value
CMIN	34.411
DF	7
CMIN/DF	4.916
GFI	0.989
CFI	0.994
RMR	0.015
TLI	0.987
RMSEA	0.063

Source: Prepared by the researcher based on AMOS statistical analysis results.

1- The CMIN/DF ratio is 4.916. Although optimal values are typically below 3, ratios between 3 and 5 are considered acceptable, indicating that the model demonstrates an adequate level of fit.
2- The Goodness of Fit Index (GFI) recorded a value of 0.989, which falls within the acceptable range between 0 and 1. Values closer to 1 indicate excellent model fit, demonstrating that the proposed model closely represents the observed data.
3- The Comparative Fit Index (CFI) yielded a value of 0.994, also approaching 1. This suggests a very good comparative fit, indicating that the model performs well relative to alternative baseline models.
4- The Root Mean Square Residual (RMR) recorded a value of 0.015. Lower values are preferred, with values approaching zero reflecting near-perfect fit, thus confirming a high-quality model.
5- The Tucker–Lewis Index (TLI) reached 0.987, a value close to 1, indicating excellent model fit. This index assesses model complexity and favors more parsimonious models with strong explanatory power.
6- The Root Mean Square Error of Approximation (RMSEA) was 0.063, which falls within the acceptable range (0.05–0.08). Although values below 0.05 are ideal, the presented value still reflects a reasonable and acceptable fit.

Overall, the results demonstrate that the proposed model investigates the required and accepted thresholds across all major fit indices. This indicates that the structural model exhibits high validity, strong goodness of fit, and robust explanatory adequacy, supporting the reliability of the study's findings and interpretations.

5. Discussion and Conclusion

The descriptive analysis revealed a positive and substantial perception regarding the importance of both Business Intelligence (BI) and profitability management. The overall mean scores for the two variables indicate strong conviction among respondents regarding the necessity of adopting these practices.

5.1 Summary of descriptive analysis results for the role of Business Intelligence and Profitability Management

The overall results indicate a positive general trend, as all dimensions related to Business Intelligence (BI) and Profitability Management (PM) were rated within the "agree" direction. The overall mean score for BI reached 3.91, while PM scored 3.73 on the five-point Likert scale. For the BI dimensions, the results revealed that "data collection and accuracy" was the first with a mean of 3.95, followed by "data collection and accuracy" (3.95), "data analysis" (3.91), and "reporting and decision-making" (3.87). Regarding PM dimensions, "market analysis and trend forecasting" was the highest (mean = 3.79), reflecting its perceived critical role in enabling forward-looking planning and strategic profitability enhancement. on the other hand, "customer monitoring and behavior analysis" was the lowest mean (3.63), indicating that while still viewed positively, it represents the least mature or least practiced aspect relative to other PM dimensions. The relatively low overall standard deviation for BI (1.139) suggests a high level of consistency and convergence among respondents concerning the importance of its components. In contrast, PM exhibited more variation; "market analysis and trend forecasting" showed the lowest dispersion (SD = 1.125), whereas "customer monitoring and behavior analysis" had the highest (SD = 1.17)

5.2 Summary of factor analysis results

The confirmatory factor analysis (CFA) results for the Business Intelligence (BI) construct—which comprises the dimensions of data collection and accuracy, data analysis, and reporting and decision-making—demonstrated excellent models fit across all standard indices. The CMIN/DF value was 2.677, falling well below the accepted threshold of 3, thereby indicating strong model adequacy. The goodness-of-fit index (GFI = 0.985), comparative fit index (CFI = 0.994), and Tucker–Lewis index (TLI = 0.987) all exhibited high values, confirming a very good alignment between the proposed model and the observed data. Furthermore, the root means square residual (RMR = 0.019) and the root means square error of approximation (RMSEA = 0.041) remained within the optimal acceptable ranges. Collectively, these results affirm that the BI measurement model meets the required statistical standards and that the observed items strongly and directly correspond to their underlying latent factors. Similarly, the CFA conducted for the Profitability Management (PM) construct—which encompasses customer monitoring and behavior analysis, market analysis and trend forecasting, and strategic direction and decision-making—revealed a high degree of model fit. The CMIN/DF value of 2.780 fell within the acceptable threshold, while the indices GFI (0.986), CFI (0.993), and TLI (0.985) all reflected excellent model adequacy. The RMR (0.020) and RMSEA (0.042) values further supported the model's robustness and congruence with the empirical data. Taken together, these indicators confirm that the PM model satisfies the essential statistical fit requirements and that strong, significant relationships exist between the observed indicators and their corresponding latent constructs.

5.3 Summary of the results of the main hypothesis test and explanatory power (SEM)

The results of the structural equation modeling (SEM) and the explanatory power assessment (R^2) indicate that the independent variables account for a substantial proportion of the variance in the dependent variables. Business Intelligence (BI) explained 80.6% of the variance in Profitability Management (PM), while PM accounted for 69% of the variance in customer monitoring, 79.7% in market analysis, and 75.2% in strategic direction—values that reflect a strong explanatory capability of the proposed model. The model also exhibited excellent goodness-of-fit indices (GFI = 0.989, CFI = 0.994, TLI = 0.987, RMSEA = 0.063, RMR = 0.015), all of which fall within acceptable and optimal thresholds, confirming the statistical robustness and adequacy of the structural model. Furthermore, the SEM results supporting the main hypothesis—stating that a statistically significant relationship exists between BI and PM—demonstrated that all BI dimensions (data collection and accuracy, data analysis, and reporting and decision-making) exert positive and statistically significant effects on PM. The standardized path coefficients were 0.356, 0.200, and 0.451, respectively, all highly significant at (P < 0.01). Notably, the "reporting and decision-making" dimension emerged as the most influential, underscoring the pivotal role of transforming data and analytical insights into actionable strategic decisions that enhance operational efficiency and profitability. These findings collectively support the rejection of the null hypothesis and the acceptance of the alternative hypothesis, confirming the presence of a strong, significant, and positive relationship between Business Intelligence and Profitability Management.

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