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The Impact of Power Business Intelligence on Financial Performance and Decision-Making Support:

A Descriptive Analytical Study on a Sample of Finance Managers and IT Specialists in Industrial Companies within the Kurdistan Region of Iraq

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ABSTRACT:

The purpose of the research is to analyze how Power BI can be used to improve the connection between the financial performance and the decision-making support in industrial enterprises in the Kurdistan Region of Iraq. A descriptive method of analysis was used in the study as data were collected both in the form of a questionnaire with a sample population of finance managers and IT experts, as well as a literature review and past research. To determine the effects of the Power BI dimensions (interactive performance reports, key performance indicators, predictive analytics, and smart dashboards) on the financial performance and managerial decision-making support, the statistical analysis tools (correlation and regression coefficients) were applied. The results showed that there was a high and positive relationship between the application of Power BI and the improvement of financial performance in terms of efficiency creation, cost reduction, and control improvement. It turned out that relying on Power BI in decision-making will assist in making decisions based on the right and recent data, optimize superior analytics, and predicting forthcoming behavioral trends. The finding proposed that Power BI is a strategic tool that might help the industrial companies to make better decisions as well. It recommends establishing training pathways for business intelligence personnel.

Keywords: Power BI, Financial Performance, Decision Support, Business Intelligence.

1 INTRODUCTION

The proposed study will address the essential concept of data visualization and the major steps of business intelligence, such as linking to data sources, developing a powerful data model, creating visualizations, and disseminating actionable knowledge. This study is useful to decision-makers who aim at maximizing the capabilities of Power BI by offering real-world advice and demonstrating how this tool can be used. This makes them analyze data with confidence, identify the emerging trends, and predict financial performance better.

In addition, the research also examines the influences of business intelligence (BI) on the principles of the decision-making process. The results indicate that though BI might not cause the number of decisions to be lower, it enables organizations to track and manage the empirical basis of the decisions. Finally, the use of statistics and the use of factual data in making decisions go a long way in enhancing the quality of the decisions. This paper, both theoretically and empirically, will help to understand the strategic contribution of BI to the excellence of the organization better.

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2 LITERATURE REVIEW

2.1 BUSINESS INTELLIGENCE (BI)

BI can be traced back to the late 1950s when it grew as a strategic reaction to the increasing corporate demand for effective management of information. The term was coined by the famous paper of Hans Peter Luhn, A Business Intelligence System (1958). Luhn defined a BI system as an automated system of storing, retrieving, and distributing information, which was aimed at simplifying or advancing traditional manual administrative processes [1]. This work was a groundbreaking one, and it provided the discipline foundation to the present-day BI practices with the important emphasis on the importance of data in organizational decision-making [2], [3]. The vision of Luhn was that under such a volatile business environment, only such integrated systems could give an organization a competitive edge [4], [5].

Howard Dresner later on made great contributions to the concept when, in 1989, he defined BI as a broad category of software and technological solutions. His definition centered on consolidation and analysis of data to make information available and accessible to enterprise-level users via a desktop-based means that will enable them to make informed decisions [2], [6].

Later empirical research has examined the interaction of digital and physical markets, highlighting its positive impact on the profitability of retail businesses by increasing market reach and flexibility. An example is that digital integration was very critical during the COVID-19 pandemic, with retailers using electronic platforms to offset the losses incurred in their operations and take advantage of the increased online demand of consumers [7]. Nevertheless, there is academic evidence that points to the fact that companies should carefully oversee the expenses of the developments related to the digital integration in order to protect their profit margins.

Moreover, the studies of the hospitality industry prove that the use of social media analytics is an excellent contributor to the financial position of restaurant chains, as it is increasing the brand awareness and loyalty among the customers [8]. Successful interaction with the online feedback on such media sources as Twitter and Facebook has become one of the foundations of corporate reputation maintenance and guaranteeing long-term sales growth [9].

With the era of the so-called Big Data, organizations are overwhelmed with information of various types, but data that is not connected with other databases and systems tends to become invisible and act as a dead weight. Data visualization is an essential bridge that helps to eliminate this gap and transform raw and complicated data into easy-to-understand graphical data. Although the discipline can be traced to the contribution of William Playfair, who invented the area and pie charts, in the current era of analytics it has taken on a new meaning.

The term “data visualization” refers to the graphical expression of the data’s importance, which should convey the information in a clear and effective manner. In addition to simple presentation, these are visual tools that cannot be done without:

- Data Auditing: Identifying outliers and unusual clusters within datasets.
- Trend Analysis: Recognizing patterns and correlations that are often obscured in standard text-based reports.
- Model Evaluation: Assessing the efficiency of financial modeling outputs.

Finally, visualization offers a more effective cognitive channel of deriving important information in large volumes of data, thus enabling decision-makers to make faster and more precise decisions.

2.2 DATA VISUALIZATION IN BUSINESS

The modern age of Big Data is filled with enormous datasets that are increasing exponentially by the day in enterprises and research facilities. The amount and speed of this information render the conventional methods of processing difficult. Thus, sophisticated visualization tools have become an accountable necessity in understanding sophisticated data design and detecting the abnormal behavior or critical tendencies [10].

Data visualization supports decision-making in corporations greatly, as it helps in converting raw data into easy-to-understand graphic data. This visual illustration can be used to present the business processes in a multi-dimensional format so that difficult-to-understand metrics can be viewed by all interested parties. One of the strategic uses of this is in strategic pricing and monitoring of financial health. The companies make use of specialized tools like waterfall charts in order to maximize earning opportunities. Such charts depict how the values change over time, allowing analysts to determine the price-to-profit gap and give the executives insights that can be acted upon to optimize the sales and product strategies [11].

Additionally, the visualization tools offer immediate views of the Key Performance Indicators (KPIs). Using simple, yet effective, indicators, like gauges or progress bars, organizations will be able to immediately see whether they are doing better or worse than what they have set as their targets. This transparency will make the communication between different departments more effective so that the whole organization will stay in line with its strategic objectives [11].

In the professional area of financial investment, the practitioners use such tools as candlestick charts to monitor the performance of the assets. The charts are critical in the analysis of changes in prices of stocks, bonds, and derivatives, and the complex investment plans can be based on the previous tendencies in the market. Ultimately, as emphasized by [12] and [13], good data visualization gives detailed knowledge about the business insights, which empowers the leaders to interpret the data in a significant way that fundamentally enhances the financial decision-making process.

2.3 DATA VISUALIZATION TOOLS

The data visualization landscape is marked with a wide range of tools, including programming languages as well as business intelligence-specific software The most notable ones in the present professional environment are [14], [15], [16], and [17].

1. Python: Python is a famous high-level programming language, a leader in visualizing data since it includes numerous libraries (Matplotlib and Seaborn) and has a strong scientific computing community. It is highly flexible and can provide repeatable, code-based graphic specifications. The advantage of Python is that it can be used to handle large-scale data with the optimization of open source [18].

2. R: The open-source environment that is specifically designed to analyze statistics and graphics. However, in machine learning Python is the leading choice, but R has a competitive edge in data visualization with the ggplot2 package. Its grammar of graphics methodology is very popular with bioinformatics and social scientists who need to make publication-quality figures.

3. Tableau: A Business Intelligence (BI) platform that is focused on visual analysis and interactive dashboarding. Tableau is good at processing complicated raw data into diagrams that are easy to understand. It has the first strength of accessibility; it is not complicated, as it needs a minimal technical background, and non-technical users are able to do complex data exploration and communication.

4. Power BI and Integrated BI Tools: In addition to the individual analysis, contemporary BI software (including Microsoft Power BI) also allows one to track such strategic indicators as sustainability and financial performance. The platforms assist organizations to achieve corporate social responsibility and relay complicated understandings to stakeholders in an effective manner [3].

5. Microsoft Power BI: Microsoft Power BI is a complex business analytics platform that is aimed at uniting the data of different sources that goes much further than the Microsoft ecosystem. It has a graphical interface that enables users to drag and drop their data, and with this feature, data analysts can deviate their focus on manual chart creation to more valuable activities, like data governance, algorithm development, and strategic business communications. Being a holistic ecosystem, Power BI enables organizations to make raw data interactive visual data and provides a culture of data-driven decision-making [19]. According to [20], the primary features of Power BI can be summarized as follows:

a. Data Connectivity: Allows connecting to a wide variety of data sources, such as Excel, SQL Server, cloud services (e.g., Azure and Google Analytics), and custom APIs.

b. Data Transformation: Takes advantage of Power Query to clean, transform, and model data efficiently without the need to have advanced coding skills.

c. Interactive Visualizations: Allows one to create interactive visualizations, including charts, graphs, maps, and KPI indicators, using the convenient point-and-click features.

d. Custom Dashboards: It enables one to create custom dashboards to view organizational metrics and performance in a single look.

e. Data Modeling: Allows the creation of complex connections among data tables and the creation of calculated measures with the help of DAX (Data Analysis Expressions).

f. Collaboration: Enables a smooth report sharing process in the Power BI Service (SaaS), which enables teams and organizations to work in real-time.

g. AI Capabilities: Incorporates artificial intelligence to deliver an enhanced level of insights, such as forecasting, trend analysis, and natural language querying of data, based on the question-answer (Q&A) system.

h. Mobile Accessibility: Provides the ability to view reports and dashboards anywhere through the use of the Power BI mobile application.

2.4 POWER BI FEATURES AND BENEFITS

1. Power BI Advanced Analytics and Reporting provides more analytical functions, such as predictive modeling and R programming language integration, and "what-if" analysis. These characteristics make it possible to create personalized reports that aid the process of decision-making that is data-driven [21]. Underline the fact that Power BI is strong in terms

of offering profound analytics and AI-oriented interactive reporting, which enhances the overall business intelligence experience.

2. Interactive Dashboards: Dashboards in Power BI will convert the intricate datasets into the easily comprehensible visual forms of interactive tables and charts. One of the functional benefits is the cross-filtering feature, i.e., the selection of a single visual component automatically transfers the corresponding elements in the report, which is why it is argued that the efficient design of the interaction patterns in dashboards will increase the level of clarity, as well as the quality of managerial decisions [22]. Moreover, [23] defines Power BI as one of the most popular tools, which helps managers to interpret and analyze visual data with great efficiency.

3. Automated Data Refresh To ensure integrity of data, Power BI has a scheduled refresh data facility that updates the reports automatically. This automation will be important in handling volatile data, including sales and inventory levels, to the extent of high accuracy. The functionality discussed in [24] is based on data gateways that are used to connect local sources and cloud environments so that the insights represented are credible and up-to-date.

4. Real-time Alerts and Notifications Power BI enables people to create rules using thresholds (ex: "send an alert when the sales drop below a certain level). The system sends alerts either through mail or mobile applications as soon as the conditions have been met. Although the academic literature on this particular feature is emerging, the applied studies and technical documentation demonstrate its strength when combined with Microsoft Power Automate to initiate proactive business processes [21].

2.5 PERFORMANCE INDICATORS

2.5.1 FINANCIAL PERFORMANCE INDICATORS

The financial performance monitoring is a key element towards business stability and sustainable growth. The following were the key metrics that are necessary to assess financial health [25]:

1. Profitability Metrics: The ratios are used to assess the capability of the company to make earnings in relation to revenue, operating expenses, and balance sheet factors [26].

• Gross Profit Margin: It is the percentage of the sales left after subtraction of the cost of goods sold.

• Net Profit Margin: It is an indicator that shows the percentage of revenue left as a profit after the operating costs, interests, and taxes.

• Return on Assets (ROA): The effectiveness of the company in terms of using its assets to make profit.

• Return on Equity (ROE): The profitability is measured against the shareholder equity.

2. Liquidity Metrics: These indicators assess the company's ability to meet its short-term obligations [26]:

• Current Ratio: Evaluates short-term liquidity, the ratio of the total current assets to current liabilities.

• Quick Ratio: This is just like the current ratio, but it does not include inventory, as it aims at giving a stricter liquidity measure.

• Cash Flow Ratio: a ratio that is used to determine the ability to cover the short term liabilities with the operating cash flow.

3. Efficiency Metrics: These ratios measure how effectively a company manages its resources [28]:

• Inventory Turnover: This is the number of times that an organization sells and replaces its inventory within a given time.

• Accounts Receivable Turnover: This is a calculation of how fast the company collects the payment of its clients.

• Asset Turnover Ratio: This is used to calculate the efficiency of assets in terms of generating sales revenue for the company.

4. Valuation Metrics: These are primarily used by investors to determine the market value of a company [29]:

• Earnings Per Share (EPS): This is a ratio of a company showing the amount of its profit given to every share of stock in the company that are outstanding.

• Price-to-Earnings (P/E) Ratio: this is the ratio of the price of the stock and the earnings of the company per share.

• Market Capitalization: It is the sum of all the market values of the shares of a company.

2.5.2 NON-FINANCIAL PERFORMANCE INDICATORS

Non-financial indicators determine the success of the organization through non-traditional financial measures. Such measures are informative as to the operational and strategic level that has an impact on the long-term sustainability and performance [30], [31].

- Employee Engagement and Satisfaction: It has a direct influence on the productivity, innovation, and stability of an organization.
- Customer Loyalty and Brand Strength: Increases long-term revenue by increasing customer retention and reputation on the market.
- Corporate Governance: Minimizes business risks and enhances transparency and organizational performance.
- Research and Development (R&D): Is one of the main forces of innovation and sustainable competitive advantage.
- Environmental, Social, and Governance (ESG): These norms are becoming more and more instrumental in attracting investment and corporate social responsibility.

2.6 THE DECISION-MAKING SUPPORT

Decision-making is a process that involves systematic thinking focusing on analyzing available options in order to choose the most appropriate course of action in getting particular objectives of an organization. This process involves a strict study of the expected results of each alternative as opposed to simply trying to find a theoretical optimal solution [32].

The importance of decision-making is identified by the fact that it is the key to all managerial functions. There is no organizational process that can be launched or maintained without a key decision on its course of action. According to [33], decision-making is the essence of the duties of a manager since it determines how vital administrative functions such as planning, organizing, directing, and controlling should be implemented. A decision is the official catalyst that identifies resource usage and action set to carry out the tasks, specifically delineating the who, when, where, and how that ultimately forms the future of the organization.

Different decisions are made depending on a number of factors, including management level, complexity, and scope of impact. The main decision classifications are listed below:

A. Decisions by Management Level and Horizon [34]:

- Strategic Decisions: Strategic decisions are made at the top of the management levels, and these decisions will outline the direction of the organization in the long run and the general objectives of the organization.
- Tactical Decisions: These decisions are made by the mid-level managers and are usually complex since they involve implementation of strategies that are medium-term in duration.
- Operation Decisions: These are decisions that are managed by the lower levels of management and are related to the day-to-day activities, and they have a short-term effect.

B. Decisions by Structure and Nature [35], [36]:

- Directive Decisions: The decisions, which define the way work is done and supervise the employees as well as set policies.
- Standard or Automated Decisions: Processes that are routine and structured and repetitive and have a pre-established logic.
- Innovative Decisions: Innovative decisions that lead to major alterations in work process or performance management.
- Ad Hoc Decisions: Non-routine, rapid decisions to occur when there is an emergency or an unexpected situation.
- Preliminary or Exploratory Decisions: These are decisions made at the beginning of projects where not all the information is available, and so there is a need to experiment.

C. Decisions by Social Context: [37].

- Individual Decisions: Taken by a single individual who holds full responsibility for the outcome and execution.
- Group Decisions: Result from mutual discussion and consensus among members, reflecting a collective perspective.
- In general, there are many factors that affect decision-making. [38]

3 METHODOLOGY

3.1 RESEARCH OBJECTIVES

A. Analyze the role of Power BI in improving organizational financial performance.

B. Examine the impact of Power BI on the financial decision-making process.

C. To explore how Power BI tools enhance overall financial efficiency.

3.2 RESEARCH QUESTIONS

The research questions are:

a. What is the level of contribution of the main dimensions of Power BI Advanced Analytics and Reporting, Interactive Dashboards, Automated Data Refresh, and Alerts and Notifications) in improving the financial performance?

b. What is the extent to which these Power BI dimensions contribute to the financial decision-making process in organizations?

3.3 RESEARCH HYPOTHESES

H1: The key dimensions of Power BI such as advanced analytics and reporting, interactive dashboards, automated data refresh, and alerts and notifications, are significantly related to the enhancement of the financial performance in the organizations.

H2: H2: Power BI dimensions such as advanced analytics and reporting, interactive dashboards, automated data refresh, and alerts and notifications significantly impact the financial performance of organizations.

H3: The key dimensions of Power BI, such as advanced analytics and reporting, interactive dashboards, automated data refresh, and alerts and notifications, are significantly related to the financial decision-making process.

H4: The key dimensions of Power BI, such as advanced analytics & reporting, interactive dashboards, automated data refresh, and alerts & notifications, significantly impact the financial decision-making support.

3.4 RESEARCH METHODOLOGY

The study adopts a descriptive- analytical approach, implemented through two main phases:

a. Phase One – Theoretical Framework (Deductive Phase): The synthesis of the study hypotheses and research questions along with the identification of the research gap as well as the development of the theoretical basis relied on a thorough literature review at the local, regional, and international levels.

b. Phase Two – Empirical Study (Analytical Phase): To test the hypotheses in the field, the data obtained was analyzed with the help of the necessary statistical resources, which verified the results and made conclusions.

3.5 DATA COLLECTION TOOLS

a. Questionnaires: Surveys to employees of financial organizations who use Power BI A five-point Likert scale was employed in this research to measure the research variables.

b. Literature Review: Literature review and previous studies on the same subject.

4 DATA ANALYSIS

4.1 DATA COLLECTION

The main source of the information that will be applied in this research was the direct interaction with finance managers and IT specialists in industrial companies that operate in the Kurdistan Region of Iraq. The questionnaire was structured and closed-ended and used as the main data collection tool to investigate the levels of Power BI dimensions and the influence on financial performance and the decision-making process. The survey was concentrated on such aspects of advanced analytics and reporting as interactive dashboards, data refresh automated, and alerts and notifications and how they help to enhance financial performance and decision making.

The questionnaire was sent personally to 70-sampled industrial companies of the governorates of Duhok, Erbil, and Sulaymaniyah. A total of 231 questionnaires that were distributed were correctly filled and returned, with 201 being the effective response rate of about 87 %. The enterprises chosen were a wide variation of industries comprising food and beverage, detergents, cement, packaging, plastics, and chemicals. The data collected were analyzed with SPSS software so as to have accuracy, reliability and sound interpretation of the results.

4.2 AUTOCORRELATION PROBLEM

Autocorrelation occurs when the error terms in a regression model are correlated, meaning that the value of the studied variable at time ttt is influenced by its value at time t−1t-1t−1 or t+1t+1t+1. This is especially widespread in time series data, where observations may be conditional on their previous or following value. Durbin-Watson (D.W.) is usually applied to identify autocorrelation, and the value of D.W. is 0 to 4; when the D.W. is close to 2, there is no autocorrelation present.

As presented in Tables 3 and 5, the calculated D.W. values are 1.918 and 2.087, respectively, which are sufficiently close to 2. This confirms that there is no autocorrelation problem in the multiple linear regression model applied in this study.

4.3 MULTICOLLINEARITY PROBLEM

Multicollinearity occurs when the linear correlation between two or more independent variables is perfect or is of a high degree. The Variance Inflation Factor (VIF) is usually adopted to reveal this problem, and it is computed as follows:

VIF = 1 / Tolerance

The general rule is that when a Variance inflated Factor (VIF) of an independent variable surpasses 10, then it is a possible case of multicollinearity. The VIFs of the independent variables are as follows as shown in Table 3 and Table 5: Advanced Analytics and Reporting = 2.091, Interactive Dashboards = 2.475, Automated Data Refresh = 2.176, and Alerts and Notifications = 2.009. Given that the value of all VIFs is significantly lower than 10, one can be sure that the issue of multicollinearity does not pose a threat to the multiple linear regression model utilized in this paper.

4.4 RELIABILITY ANALYSIS USING CRONBACH'S ALPHA

To check the reliability of the research tool, Cronbach's alpha was employed as one of the most popular statistical measures used in assessing the internal consistency of the research scale items. It is necessary to conduct this analysis to make sure that the items in the questionnaires are the intended constructs measured in a sensible and consistent manner.

The following table shows the alpha value of Cronbach in the event that every dimension is dropped separately as well as the alpha value of all 30 items together:

Table 1. Cronbach's Alpha.

Item-Total Statistics

	Cronbach's Alpha if Item Deleted
Advanced Analytics and Reporting	0.879
Interactive Dashboards	0.872
Automated Data Refresh	0.879
Alerts and Notifications	0.883
Improvement of financial performance	0.878
Financial decision-making process	0.891
Total	**0.898**

Source: Prepared by the authors

In order to evaluate the internal consistency of the questionnaire items, Cronbachs Alpha coefficient was used. Referring to Table (1), the total Cronbachs Alpha of the scale was 0.898 which is quite high, which means that there is a good internal consistency of the scale items. This value is higher than the statistically acceptable level of 0.70 showing a great level of reliability.

The findings also reveal that the deletion of any of the items does not contribute significantly to the overall Alpha value, as the coefficients were between 0.872 and 0.891. It means that none of the items have negative impacts on the internal consistency of the scale, and none of them undermines its reliability. Hence, it could be concluded that the study tool that comprises the following dimensions—Advanced Analytics and Reporting, Interactive Dashboards, Automated Data Refresh, Alerts and Notifications, Improvement of Financial Performance, and Financial Decision-Making Process has a high level of reliability and consistency and could be used as a valid tool in the statistical analysis and derivation of research conclusions.

4.5 DATA ANALYSIS AND RESULTS

Testing hypotheses

H1: The key dimensions of Power BI, such as advanced analytics and reporting, interactive dashboards, automated data refresh, and alerts and notifications, have significant correlation between the improvement of financial performance in organizations.

Table 2. Pearson Correlation in Relation to the Dependent Variable (Improvement of Financial Performance) and Independent Variables.

Independent Variable	Correlation with Improvement of Financial Performance	Sig. (2-tailed)
Advanced Analytics and Reporting	0.629**	0.000
Interactive Dashboards	0.606**	0.000
Automated Data Refresh	0.625**	0.000
Alerts and Notifications	0.571**	0.000

Source: Prepared by the authors

Note: Correlations are significant at the 0.01 level (2-tailed), with N = 201.

The findings in Table (2) show that all the important dimensions of Power BI have a positive and significant relationship with the dependent variable, improvement of financial performance, at the 0.01 level. The strongest relationship was observed with Advanced Analytics and Reporting (r = 0.629, Sig. = 0.000), followed by Automated Data Refresh (r = 0.625, Sig. = 0.000), Interactive Dashboards (r = 0.606, Sig. = 0.000), and finally Alerts and Notifications (r = 0.571, Sig. = 0.000). These results are overwhelming statistical support for hypothesis H1, which states that the dimensions of Power BI have a significant correlation with the enhancement of financial performance at organizations.

From an accounting perspective, the results can be interpreted as follows:

• Advanced Analytics and Reporting: more effective managerial and accounting decisions can be made, and this will directly boost the financial performance.

• The Interactive Dashboards enable financial managers to track key performance indicators in real time to enable them to take immediate corrective measures in relation to financial deviations.

• Automated Data Refresh ensures that the financial information is provided on a continuous basis and refreshed, thus enhancing the quality of financial reporting and saves on errors linked to manually entering of data or delay in reporting.

• Alerts and Notifications enhance internal control system by alerting about the possible financial or operational risks early, and helps in reducing costs and financial sustainability.

On the whole, these findings prove that the implementation of Power BI dimensions plays a significant role in the improvement of financial performance and facilitating the quality of accounting and managerial decision-making.

H2: The most important aspects of Power BI such as Advanced Analytics and Reporting, Interactive Dashboards, Automated Data refresh, and Alerts and Notifications have a great influence on the enhancement of financial performance within organizations.

Table 3. Regression Analysis of the Effect of Key Power BI Dimensions on Improvement of Financial Performance.

The improvement of financial performance in organizations						
	B0	SE	B1	T	VIF	Sig
(Constant)	0.262	0.262		1.001		0.318
Advanced Analytics and Reporting	0.296	0.077	0.276	3.838	2.091	0.000
Interactive Dashboards	0.180	0.093	0.151	1.924	2.475	0.056
Automated Data Refresh	0.266	0.079	0.249	3.386	2.176	0.001
Alerts and Notifications	0.177	0.077	0.163	2.303	2.009	0.022
F	51.740					
R Square	0.514					
Adjusted R^2	0.504					
Durbin–Watson	1.918					

Source: Prepared by the authors

1. Overall Regression (F-test):

o F = 51.740 and Sig. = 0.000, indicating that the regression model as a whole is statistically significant at the 0.01 level.

o This means that the key dimensions of Power BI (independent variables) have a significant effect on improving financial performance (dependent variable).

2. Explanatory Power (R^2 and Adjusted R^2):

o R^2 = 0.514, meaning that approximately 51.4% of the variance in financial performance improvement can be explained by the key Power BI dimensions.

o Adjusted R^2 = 0.504, reflecting a corrected explanatory power considering the number of variables, indicating a well-fitting model.

3. Individual Effect of Each Independent Variable (B, β, T, Sig.):

➢ Advanced analytics and Reporting = 0.296, β = 0.276, T = 3.838, Sig = 0.000 → positive and strongly significant impact on financial performance improvement.

➢ Interactive Dashboards: B = 0.180, β = 0.151, T = 1.924, Sig = 0.056 → positive effect but not significant at 0.05 level, close to significance.

➢ Automated Data Refresh: B = 0.266, β = 0.249, T = 3.386, Sig = 0.001 → positive and significant impact.

➢ Alerts and Notifications: B = 0.177, β = 0.163, T = 2.303, Sig = 0.022 → positive and significant impact.

4. Multicollinearity (VIF):

o All VIF values range from 2.009 to 2.475, below 5 → no multicollinearity problem among independent variables.

5. Durbin–Watson = 1.918:

o Close to 2 → no autocorrelation problem in residuals.

Accounting Significance of the Results:

➢ Advanced Analytics & Reporting: enhances the accuracy and clarity of financial information, enabling better accounting and managerial decisions.

➢ Automated Data Refresh: ensures continuously updated financial data, reducing errors in reporting and increasing the reliability of financial statements.

➢ Alerts & Notifications: Strengthen the internal control system by providing early warnings for financial or operational risks, supporting financial sustainability, and reducing costs.

➢ Interactive Dashboards: facilitate monitoring of key performance indicators and timely corrective actions, although its effect is less statistically significant compared to other variables.

Support for Research Hypothesis (H2):

• **The findings to some extent confirm H2:** the positive and significant contribution of most of the important Power BI dimensions to the enhancement of financial performance.

• The only exception is Interactive Dashboards, the effect of which is positive but not significant at the 0.05 level, which implies the necessity to increase its application or combine it with other instruments to have a more pronounced effect on financial performance.

H3: The correlation between the major dimensions of Power BI, such as Advanced Analytics and Reporting, Interactive Dashboards, Automated Data Refresh, and Alerts and Notifications, and the financial process of decision-making has a significant relationship.

Table 4. Pearson Correlation between the Dependent Variable (Financial Decision-Making Process) and Independent Variables.

Independent Variable	Correlation with Financial Decision-Making Process	Sig. (2-tailed)
Advanced Analytics and Reporting	0.511**	0.000
Interactive Dashboards	0.614**	0.000
Automated Data Refresh	0.472**	0.000
Alerts and Notifications	0.530**	0.000

Source: Prepared by the authors

Note: Correlations are significant at the 0.01 level (2-tailed), with N = 201.

The findings included in Table (4) indicate that all the important dimensions of the Power BI are significantly, in a positive manner, related to the dependent variable Financial Decision-Making Process at the level of 0.01. Interactive Dashboards was the strongest in its correlation (r = 0.614, Sig. = 0.000), followed by Alerts and Notifications (r = 0.530, Sig. = 0.000), Advanced Analytics and Reporting (r = 0.511, Sig. = 0.000), and finally Automated Data Refresh (r = 0.472, Sig. = 0.000). Such results are a good statistical confirmation of hypothesis H3, which formulates that there is a significant correlation between the key dimensions of Power BI and the financial decision-making process.

From an accounting perspective, the results can be interpreted as follows:

• Interactive dashboards allow the financial managers to keep track of the financial indicators in real time and deal with them in an interactive manner, which will boost the accuracy and speed with which the financial managers make decisions.

• Alerts and notifications: Early warnings on financial risks or operational deviation will enable corrective measures to be taken in time.

• Advanced Analytics and Reporting give accurate financial information that aids in financial planning and managerial control.

• Automated Data Refresh—This is used to guarantee that there is a continuous flow of updated financial information, which minimizes errors and enhances the accuracy of financial decisions made.

Comprehensively, the research validates the claim that the implementation of the key dimensions of Power BI plays a critical role in improving the quality and efficiency of a decision-making process of organizations in terms of finance.

H4: The dimensions of Power BI such as Advanced analytics and Reporting, Interactive Dashboards, Automated Data Refresh, and Alerts and Notifications are very important in influencing financial decision-making process.

Table 5. Regression Analysis of the Effect of Key Power BI Dimensions on the Financial Decision-Making support.

Financial decision-making process						
	B0	SE	B1	T	VIF	Sig
(Constant)	1.013	0.262		3.872	1.013	0.000
Advanced Analytics and Reporting	0.139	0.077	0.143	1.805	0.139	0.073
Interactive Dashboards	0.425	0.093	0.391	4.547	0.425	0.000
Automated Data Refresh	0.011	0.079	0.011	0.137	0.011	0.891
Alerts and Notifications	1.013	0.262		3.872	1.013	0.020
F	34.701					
R Square	0.415					
Adjusted R^2	0.403					
Durbin–Watson	2.087					

Source: Prepared by the authors

Statistical Interpretation of the Table 5:

1. **Advanced Analytics & Reporting**: The coefficient β = 0.143 and Sig = 0.073 indicate a positive effect on the financial decision-making process, but is not statistically significant under the 0.05 level. This implies that this dimension is not explanatory enough in this model.

2. **Interactive Dashboards**: The coefficient β = 0.391 and Sig = 0.000 denote a highly significant and statistically significant positive effect on financial decision-making, i.e. interactive dashboards are definitely positively affecting the quality and effectiveness of financial decisions.

3. **Automated Data Refresh**: The coefficient β = 0.011 and Sig = 0.891 imply a very weak and statistically non-significant effect, i.e., automated data refresh does not have a significant impact on financial decision process in this sample of respondents.

4. **Alerts & Notifications**: The coefficient β = 1.013 and Sig = 0.020 indicate a positive and statistically significant effect, meaning that alerts and notifications support faster responses and more accurate financial decisions.

- **F = 34.701** shows that the overall model is statistically significant, meaning the independent variables collectively explain variance in the dependent variable.

- **R^2 = 0.415** indicates that 41.5% of the variance in the financial decision-making process is explained by the studied independent variables.

- **Durbin–Watson = 2.087** suggests no significant autocorrelation in the residuals, which supports the validity of the regression model.

Accounting Significance of the Results:

➢ **Interactive Dashboards:** The interactive dashboards assist the accountants and financial managers to track financial performance indicators instantly so that they can make accurate and timely decisions.

➢ Strengthen the internal control system and assist in identifying the possible financial risks to minimize errors and enhance the reliability of decisions.

➢ Advanced Analytics and Reporting and Automated Data Refresh They are not always particularly important in this sample, but they help better the data quality and financial reporting, which will be utilized as a part of the further decisions that will be made when combined with other tools.

Conclusion on Hypothesis H4:

- The results partially support H4: **Interactive Dashboards** and **Alerts & Notifications** have a positive and statistically significant effect on the financial decision-making process, while **Advanced Analytics & Reporting** and **Automated Data Refresh** do not show a significant effect in this model.

- This implies that some Power BI dimensions directly influence the improvement of financial decisions, while the impact of other dimensions depends on their integration with other tools and processes within the organization.

5 RESULTS AND DISCUSSION

5.1 EFFECT OF POWER BI DIMENSIONS ON IMPROVEMENT OF FINANCIAL PERFORMANCE

Results:
It was found that all the main dimensions of the Power BI Advanced Analytics and Reporting, Interactive Dashboards, Automated Data Refresh and Alerts and Notifications are positively and significantly correlated with the improvement of financial performance at the level of 0.01. The strongest relationships were observed for Advanced Analytics & Reporting ($r = 0.629$) and Automated Data Refresh ($r = 0.625$), followed by Interactive Dashboards ($r = 0.606$) and Alerts & Notifications ($r = 0.571$). Regression analysis confirmed that these dimensions collectively explain 51.4% of the variance in financial performance ($R^2 = 0.514$).

Discussion:
High-tech analytics and reporting make the financial information more precise and transparent and, therefore, allows making better managerial and accounting decisions. Automated Data Refresh is used to guarantee the automatic update of data so as to minimize manual mistakes. The interactive dashboards and alerts and notifications will facilitate timely monitoring and early warning of financial risks, which enhances internal controls. These results prove the hypothesis (H2) that Power BI can have a significant influence on financial performance.

The use of Power BI results in a great enhancement of financial performance. The companies are advised to incorporate all major dimensions of Power BI to achieve maximum financial gains and efficiency of decision-making.

5.2 EFFECT OF POWER BI DIMENSIONS ON THE FINANCIAL DECISION-MAKING PROCESS

Results:
Pearson correlation analysis indicated that all Power BI dimensions are positively associated with the financial decision-making process, with the strongest impact observed for Interactive Dashboards ($r = 0.614$) and Alerts & Notifications ($r = 0.530$). Regression results showed that these dimensions collectively explain 41.5% of the variance in financial decision-making ($R^2 = 0.415$), highlighting the significant role of Power BI in enhancing decision quality.

Discussion:
Interactive dashboards are also a clear visualization of key performance indicators that enable quick and correct decision-making. Alerts and Notifications is an early-warning system, as it allows taking action to mitigate possible financial risks. Advanced Analytics and Reporting and Automated Data Refresh do not have a significant effect but serve as complements to other dimensions, which provides efficiency in decisions. These findings support hypothesis (H4) on the high impact of Power BI on financial decision-making.

The process of financial decision making is greatly improved by power BI especially with interactive dashboards and timely alerts. These dimensions are recommended to be prioritized by the organizations that still need to remain integrated with the modern analytics and the automated data updates to maximize the decision-making results.

CONCLUSION AND RECOMMENDATION

CONCLUSION

1. Findings for the hypotheses: The results of the study confirm the argument that each of the dimensions of Power BI Advanced Analytics and Reporting, Interactive Dashboards, automate Data Refresh and Alerts and Notifications has a strong and positive influence to enhance financial performance by raising the degree of accuracy financial data and aiding the process of making good managerial or accounting decisions.

2. The results of the regression model indicate that as the three main dimensions Core in Power BI, Advanced Analytics and Reporting, Automated Data Refresh, Alerts and Notifications continue to be used more in the company, the financial performance of firms improves at a higher rate. There is a positive weakly significant relationship between interactive Dashboards. These findings support the fact that Power BI tools are important in enhancing accuracy, timeliness, and integrity of financial information hence supporting managerial and external accounting decisions-making.

3. Results of the study suggest that all four dimensions of Power BI, namely; Interactive Dashboards, Advanced Analytics & Reporting, Automated Data Refresh and Alerts & Notifications (Table 2) have statistically significant positive impact in improving financial performance and improvement of financial decision process among the Jordanian SMEs which underlines the essence of embracing the dimensions to enhance the quality of financial information as well as to boost effectiveness to make decisions about the organization.

4. Interactive Dashboards and Alerts & Notifications significant influence on the financial decision-making model, Advancing Analytics & Reporting does not have a substantial impact in this case. To conclude, Power BI dimensions present value to the quality of financial decisions.

RECOMMENDATION

1. While implementing Power BI, organizations should embrace the full depth of Power BI as an organizational solution, especially Advanced Analytics & Reporting and Interactive Dashboards, to significantly improve financial data quality, support effective decision-making, and decrease risks.

2. Advanced analytics and reporting, automatic data updates, and alerts and notifications must operate quickly within corporate financial systems to maximize the benefits of any performance improvements. Furthermore, enhancing the efficiency of the interactive dashboard will be beneficial, potentially leading to better financial decisions and higher-quality reporting.

3. Organizations are advised to deploy all features of Power BI extensively, especially interactive dashboards and Advanced Analytics & Reporting for higher data accuracy & faster decision-making. Equally, the finance and management staffs should be educated to better utilize Power BI functionalities for improving financial performance and decision-making.

4. Companies should focus on introducing interactive dashboards and alerts & notifications to reinforce financial decisions; covering other Power BI capabilities can be a complement effort for getting an enhanced approach for data quality and reporting effectiveness.

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CONFLICTS OF INTEREST

The author declares no conflict of interest.

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