

Impact of Interactive Dashboards on Strategic Decision-Making

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Abstract

The use of digital technology and data-driven approach in managing businesses has led to increased production of structured and unstructured data. Transforming such information into valuable insights for strategic planning is the main difficulty faced by many organizations. Reporting systems provide organizations with static and delayed data, thus limiting their ability to respond to changes in market dynamics. Interactive dashboards are modern business intelligence solutions that combine real-time analysis, visualizations and reporting features. In this study, the effect of interactive dashboards on the process of strategic decision-making will be analyzed by focusing on the way in which the technology is used to improve the decision-making process by increasing its speed and efficiency. In addition, the research will highlight how interactive dashboards enable organizations to transform complex data into understandable visualizations. It will also show the contribution of interactive dashboards in ensuring transparency and collaboration within organizations.

It is evident from the research results that organizations using interactive dashboards register considerable gains in terms of increased efficiency and agility. The decision makers can keep track of the important performance indicators on a real-time basis, minimize dependence on the process of manual reports generation, and be more flexible in reacting to the changes and threats. Moreover, interactive dashboards lead to greater engagement of users and help communicate the information about the business. Indeed, interactive dashboards can be considered an integral part of current BI environment and a great tool for making strategic decisions. The ability of interactive dashboards to present data promptly and intuitively is crucial for companies that wish to make decisions and increase their strategic capability to obtain a sustainable competitive advantage.

Keywords: Interactive Dashboards, Business Intelligence, Strategic Decision-Making, Data Visualization, Real-Time Analytics, Data-Driven Decision Making, Organizational Performance, Competitive Advantage.

1. Introduction

Rapid technological development and creation of data-based models of business activity have been related to the emergence of huge amounts of data created by companies. In today's world, enterprises have been managing large volumes of information that have been generated from various sources, such as ERP systems, CRM systems, social networks, databases and operations management systems. Having access to such huge volumes of information brings many opportunities and challenges for organizations striving to get some valuable insights and making better strategic decisions. Strategic decisions are important for the further development and sustainability of any organization. At the same time, traditional approaches to reporting are based on static reports and summaries that do not allow getting immediate insights and valuable information. Such limitations make it very hard for decision-makers to identify emerging trends and changes in the market. Hence, it is necessary that organizations have certain unique means of analyzing the data.

Interactive dashboards have evolved as an indispensable part of modern BI systems through the integration of visualization of data, real-time analytics and reporting capabilities in one system. Unlike traditional reporting solutions, interactive dashboards allow the management and executive personnel to monitor KPIs in real time, perform drill-down analysis, find patterns and trends in data, as well as generate new insights based on data. The interactive approach helps to understand the business performance and make decisions in a timely manner. Besides, interactive dashboards contribute to organizational transparency and enhance collaboration between various departments through the provision of a consolidated business information. In addition, they facilitate the interpretation of complex data sets thanks to the use of data visualizations which make the cognitive processing of information easier.

This paper explores the influence of interactive dashboards on the decision-making process by analyzing the effect of interactive dashboards on decision quality and response time, as well as organizational performance. The results of this research will give important insights into the increasing importance of interactive dashboards for the achievement of competitive advantages in the contemporary business environment.

2. Research Objective

The principal goal of the research work is to explore the impact of interactive dashboards on strategic decision making and organizational performance within data-driven companies. In order to achieve this research goal, the work concentrates on the following specific research objectives:

- **To explore the impact of interactive dashboards on the process of strategic decision making:** Based on their ability to interpret information, monitor processes and make managerial decisions.
- **To explore the impact of interactive dashboards on the performance of organizations:** Based on their contribution to efficiency, productivity and competitive advantage.
- **To identify the advantages and drawbacks of implementing dashboards:** With particular reference to data availability, increased collaboration, data integration problems and lack of user involvement.
- **To measure user satisfaction and decision-making efficiency:** Based on their impact on the quality and effectiveness of decision making.

The fulfillment of these objectives will allow the researcher to gain comprehensive knowledge about the importance of interactive dashboards in contemporary Business Intelligence (BI) systems.

3. Literature Review

Interactive dashboards have become an essential element of BI systems by allowing organizations to view their data, measure performance, and make decisions. Various authors have conducted studies to evaluate the effect of dashboards on organizational performance, data analytics, and managerial decision-making.

S. No.	Author(s)	Year	Key Findings
1	Few	2013	Interactive dashboards increase understanding of data and business results because they help to present information using visual illustrations.
2	Turban, Sharda, and Delen	2018	Business Intelligence dashboards save time in decision-making and allow for data-based managerial decisions.
3	Eckerson	2020	Real-time dashboards help to perform better strategic planning, forecasting and response to changes in business environments.

4	Davenport	2021	Companies that apply analytic and dashboards technology outstrip their competitors in productivity and profit.
5	Gartner	2023	Over 75 percent of companies utilize dashboards and visualization software in decision-making process.
6	Yigitbasioglu and Velcu	2012	Management dashboards help to enhance performance measurement and communication between organizational members.
7	Pauwels et al.	2009	Marketing dashboards include organizational performance measures and help to make strategic decisions.
8	Elbashir, Collier, and Davern	2008	Business Intelligence systems have a positive effect on the quality of managerial decisions and organizational process performance.

According to the existing literature, interactive dashboards have progressed from basic reports into advanced decision support systems. The previous body of knowledge confirms that dashboards help visualize data, provide real-time analytic and increase organizational efficiency through making timely evidence-based decisions. Additionally, dashboards assist with strategic planning, performance monitoring, and inter-departmental cooperation because all necessary business data are accessible through them.

While the current literature recognizes many advantages of implementing dashboards in an organization, there are still many issues that need to be addressed further, such as data integration problems, information overload, and lack of adoption. Also, not much attention has been paid to the effect of interactive dashboards on users' satisfaction, decision-making process efficiency, and organizational performance as a whole. Thus, the current paper tries to fill these gaps in the research area through studying the effect of interactive dashboards on decision-making process and organizational performance.

Conceptual Framework

Information Flow Process

Information flow process in an organization and the manner in which information is analyzed to come up with the insights for making sound decisions can be understood from the above-discussed conceptual framework. Above-discussed conceptual framework has six components which have been given below:

Data sources → Data warehouses → Interactive dashboard → Insights and analytics → Decision-making → Performance

The above process indicates the manner in which information is drawn out of the data to assist organizations in making good decisions.

4.1 Data Sources

Data sources represent the initial stage of the framework where information is generated and collected from various internal and external systems. Organizations receive large volumes of structured and unstructured data from multiple sources, including:

- Enterprise Resource Planning (ERP) systems
- Customer Relationship Management (CRM) systems
- Financial and accounting databases
- Social media platforms
- E-commerce applications
- Customer feedback and surveys

- Operational and transactional systems
- Internet of Things (IoT) devices and sensors

These sources continuously generate data that can be utilized for business analysis and decision-making.

4.2 Data Warehouse

The data warehouse acts as an organized database that holds data gathered from various sources. In this step, the data goes through some processing steps such as:

- Data Extraction
- Data Cleaning and Preprocessing
- Data Integration
- Data Transformation
- Data Storage and Management

The main purpose of the data warehouse is to offer consistent and accurate data for analysis by business intelligence tools.

4.3 Interactive Dashboard

Interactive dashboard works as an interface connecting the data with the decision-maker. It is useful for the purpose of converting data into visualization in the form of:

- Charts & Graphs
- Heat Maps
- Score Cards
- Tables & Reports
- KPI Indicators
- Geographical Maps & Trend Analysis

Unlike the traditional reporting system, the interactive dashboard offers real time analysis, filtering and drilling of the information.

4.4 Insights & Analytics

Dashboards offer valuable insights gained through the analysis of the data. They include:

- Descriptive Analytics (What happened?)
- Diagnostic Analytics (Why did it happen?)
- Predictive Analytics (What may happen?)
- Prescriptive Analytics (What should be done?)

These insights will assist in identifying trends, anomalies and predicting future occurrences and improve the performance of the business.

4.5 Decision Making

Insights can be used by the managers/executives in taking strategic decisions pertaining to:

- Resource Allocation
- Market Expansion
- Risk Management
- Financial Planning
- Customer Relationship Strategies
- Product Development & Innovation
- Process Improvement

Access to updated information leads to better decision-making.

4.6 Performance

Finally, better organizational performance is an expected result of the framework. Successful strategic decisions made through the use of interactive dashboards will help to achieve many positive outcomes, such as:

- Efficiency
- Productivity
- Customer satisfaction
- Profitability
- Organizational agility
- Competitive advantage
- Decision-making speed
- Strategic planning

The conceptual framework clearly shows how data collected from various sources is fed into the central data warehouse and processed into dashboards. These dashboards offer insight that can be used for making strategic decisions, thus resulting in better performance and competitiveness in an era dominated by data.

5. Research Methodology

In this research, the use of interactive dashboards will be analyzed from a quantitative and descriptive perspective to evaluate their effect on decision-making and organizational performance. The research methodology is geared towards gathering empirical data from managers and executives of various industries to evaluate the connection between dashboard use and decision-making efficiency.

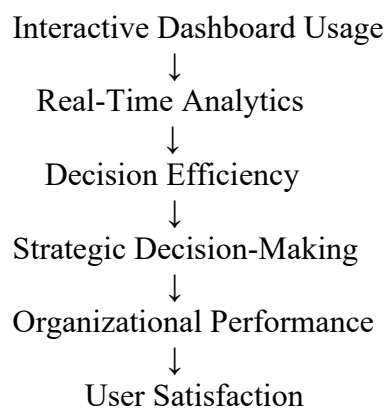
5.1 Research Design

The research follows a descriptive and cross-sectional survey design. The descriptive approach helps in understanding the current usage of interactive dashboards and their influence on decision-making processes, while the quantitative approach enables the statistical measurement of relationships among variables.

The study investigates the following variables:

- **Independent Variable:** Interactive Dashboard Usage
- **Dependent Variables:** Strategic Decision-Making and Organizational Performance
- **Mediating Variables:** Decision-Making Efficiency and User Satisfaction

5.2 Research Framework



5.3 Population and Sample Size

The target population consists of managers, executives, and business analysts working in companies utilizing the BI technology and dashboards. The sample size is 200 and the sampling technique applied is stratified random sampling.

INDUSTRY-WISE DISTRIBUTION OF RESPONDENTS

Industry	Number of Respondents	Percentage
Information Technology (IT)	60	30%
Banking and Financial Services	50	25%
Healthcare	40	20%
Manufacturing	50	25%
Total	200	100%

5.4 Data Collection Methods

The study employs both primary and secondary data collection techniques.

1. Questionnaire Survey: A structured questionnaire based on a five-point Likert Scale was designed to measure:

- Ease of dashboard usage
- Information quality
- Decision-making speed
- User satisfaction
- Organizational performance improvement

The questionnaire contains both demographic and research-specific questions.

2. Semi-Structured Interviews: Interviews with senior managers and executives were conducted to gain qualitative insights into:

- Dashboard implementation challenges
- Factors influencing dashboard adoption
- Organizational benefits derived from dashboard systems
- Strategic implications of real-time analytics

3. Secondary Data Analysis: Secondary information was collected from:

- Research articles
- Industry reports
- Company annual reports
- Business Intelligence publications
- Gartner and consulting reports
- Academic journals and conference proceedings

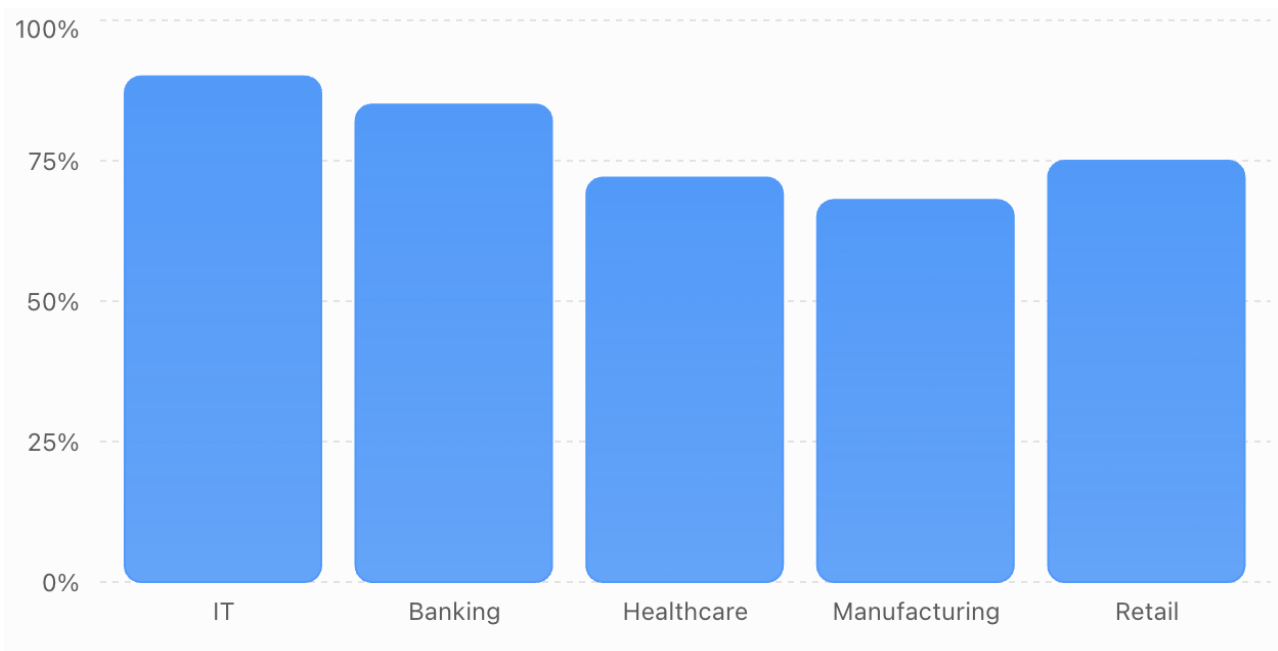
The proposed methodology provides a systematic approach to evaluating the impact of interactive dashboards on strategic decision-making and organizational performance across multiple industries.

4. Results and Discussion

Graph 6.1: Adoption Rate of Interactive Dashboards Across Industries

Dashboard Adoption by Industry

Percentage of organizations using interactive dashboards.

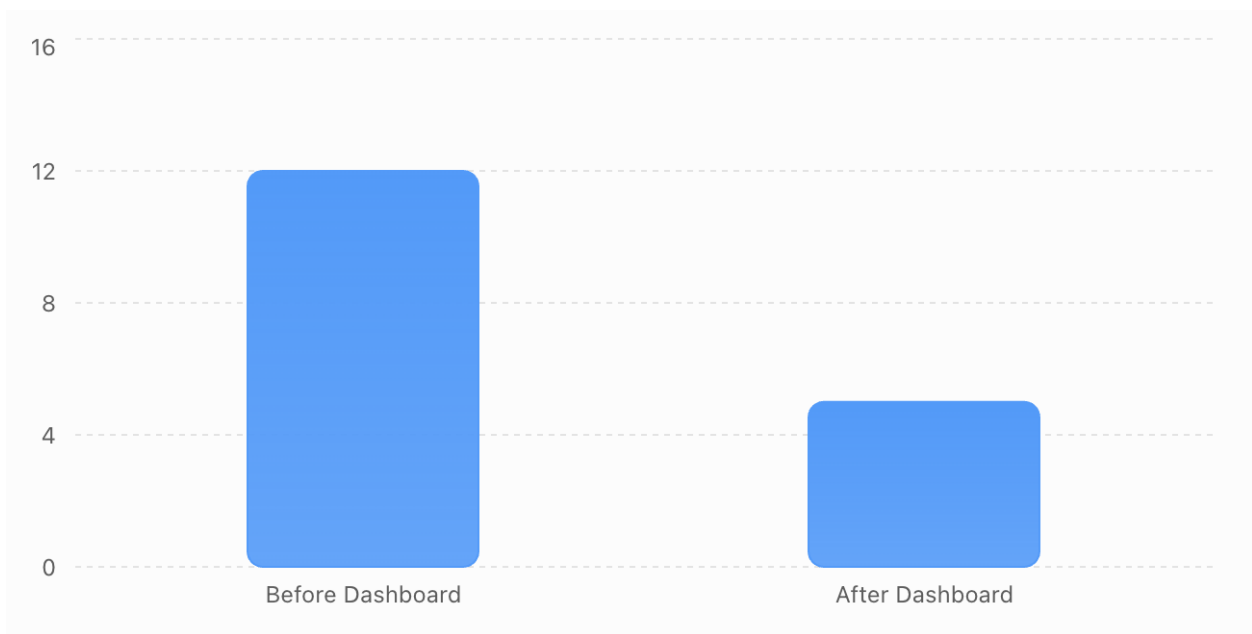


Interpretation: The IT and Banking sectors have the highest adoption of interactive dashboards due to their reliance on real-time analytics.

Graph 6.2: Decision-Making Time Before and After Dashboard Implementation

Reduction in Decision-Making Time

Average time required to make strategic decisions.

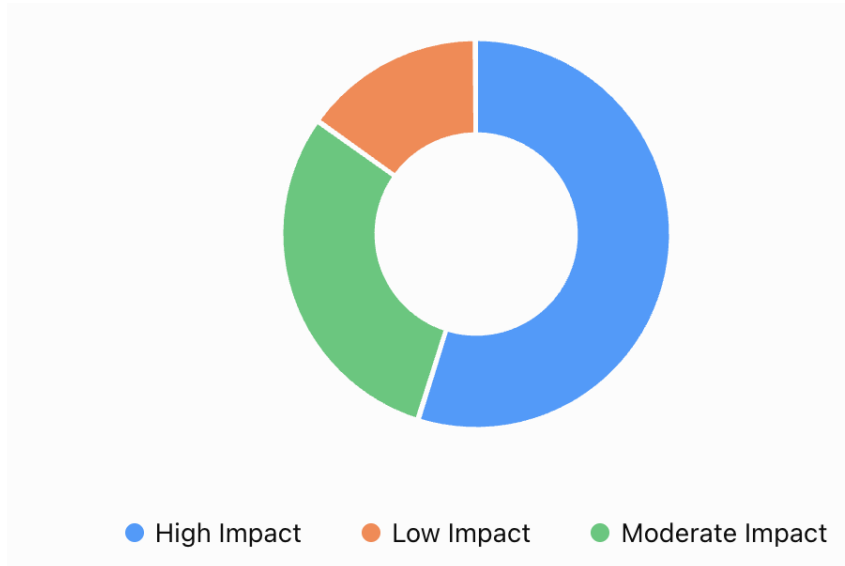


Interpretation: Organizations reduced their decision-making time by approximately 58% after implementing interactive dashboards.

Graph 6.3: Impact on Organizational Performance

Perceived Impact on Performance

Managers' perception of dashboard effectiveness.



5. Future Scope

While there are significant advantages associated with interactive dashboards, some areas need further research in the future:

- **Artificial Intelligence and Machine Learning:** The future dashboards can make use of AI and machine learning techniques to offer predictive and prescriptive analytics for proactive decision making.
- **Real-time Analytics of Big Data:** There is an opportunity to integrate dashboards with big data analytics tools to carry out real-time analytics of large-scale data.
- **Sector Specific Development of Dashboards:** In the future, there can be studies on developing customized dashboards for industries such as healthcare, banking, manufacturing, education, and smart cities.
- **Cloud Based and Mobile Dashboards:** The future scope of the research includes development of cloud based and mobile dashboards to enhance decision making in remote environments.
- **Integration of Natural Language Processing (NLP):** Future dashboards may include conversational interfaces which allow users to work with data using natural language interface.
- **Advanced Visual Analytics:** The latest visualization techniques like Augmented Reality (AR), Virtual Reality (VR), and Immersive Analytics can be used in dashboards.
- **Security and Privacy:** Security concerns can be considered in designing dashboards along with the appropriate data privacy mechanisms and access control frameworks.

The future of the interactive dashboard depends on the coming together of Business Intelligence, Artificial Intelligence, and the technology of analytics. This will enable companies to make smarter decisions in an environment that is rapidly changing.

6. Conclusion

In this regard, the current research considered the effect of interactive dashboards on strategic decision-making and organizational performance in data-driven organizations. The results show that interactive dashboards are used by the organization for more efficient analysis of the available information and

decision-making process within an organization. Interactive dashboards allow using real-time analysis, visualization of data and performance monitoring of the organization's work which allows making better and faster decisions.

Additionally, it is shown that interactive dashboards increase operational efficiency, effective resource usage and organizational performance. Interactive dashboards allow continuous monitoring of KPIs, trend detection and identification of any anomalies in the business processes. Moreover, interactive dashboards allow making decisions based on real-time reports which eliminates the need for manual reporting procedures. At the present stage of digital transformation, interactive dashboards are becoming an integral part of Business Intelligence Systems and strategic management practices. Thus, investment into interactive dashboards can provide additional benefits to the organization.

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