



# **A Study on Business Intelligence and its Effect on Operational Efficiency in Business Analytics in the IT Services Sector, with Special Reference to Chennai**

**Hrithik R, Dr. Nivetha P**

Student, Department of MBA, School of Management Studies, Sathyabama Institute of Science and Technology,  
Chennai, Tamil Nadu, India

Professor, School of Management Studies, Sathyabama Institute of Science and Technology, Chennai,  
Tamil Nadu, India

**ABSTRACT:** In today's competitive environment, organizations rely heavily on data-driven approaches to improve their performance and decision-making processes. Business intelligence plays an important role in transforming raw data into meaningful insights that support operational activities. Further, the study aims to assess the role of data quality and accessibility in improving decision-making and operational outcomes. Descriptive research design and convenience sampling method has been used. The sample size of this study is 120. Questionnaire has been used as a primary data. Simple percentage analysis, chi-square analysis, correlation statistical tools have been applied to reach the findings of the study. The study found that employees are generally satisfied with the usability and functionality of business intelligence tools in Chennai. It revealed that most respondents perceive BI systems as effective in improving data access, reporting, and visualization. The findings showed that integration with internal systems and real-time data processing is fairly efficient. It revealed that BI tools have positively influenced operational areas such as scheduling, procurement, and daily workflows. The study concluded that business intelligence plays a significant role in enhancing operational efficiency within the organization. It suggested that further improvements in system usability, integration, and training can strengthen overall performance.

**KEYWORDS:** Business Intelligence (BI), Operational Efficiency, Business Analytics, Data-Driven Decision Making, BI Tools and Applications

## **I. INTRODUCTION**

Business Intelligence is critical in gathering and controlling data of organisations. It enables firms to receive the structured and unstructured data of different sources, including sales, finance and operations. The Business Intelligence tools store this data in warehouses or cloud platforms where it can be accessed easily. Data is accurate, secured and consistent with proper management. It minimises duplication and allows analysis to take place fast. BI is an automated way of data collection, which conserves time and reduces human mistakes. This forms the foundation for informed business analytics. Business Intelligence plays an important role in the analysis of complicated data to identify trends and patterns. It facilitates descriptive, diagnostic, predictive, and prescriptive analysis. Business Intelligence can aid the process of determining strengths, weaknesses, opportunities, and threats by analysing data correctly. The insights are available in visual dashboards and reports that can be accessed by non-technical users. The real-time analysis assists companies in reacting promptly to changes in the markets. Business Intelligence transforms unstructured data into intelligence, which drives organisational decisions. This empowers overall business analytics.

## **OBJECTIVES OF THE STUDY**

- To examine the influence of BI tool usability on operational efficiency in the business analytics domain
- To assess how data quality and accessibility in business intelligence systems affect operational efficiency

- To evaluate the impact of integration between business intelligence tools and existing systems on operational efficiency
- To analyse the overall contribution of business intelligence practices toward improving operational efficiency in business analytics
- To provide suggestions for enhancing operational efficiency through better business intelligence adoption in the business analytics environment

## II. REVIEW OF LITERATURE

**Ramzan & Reforgiato Recupero, (2025)** authored an extensive literature study on the optimisation of predictive maintenance in smart manufacturing industries, which is essential in the BI effect on the efficiency of operations in the sectors using such equipment as coolers and condensers. The aim was to discover the existing strengths and weaknesses of the contemporary AI and BI systems and the aspects of data scarcity and human-technology interface. The results showed that developed AI models and BI processes can greatly enhance prediction quality and operational decision support, and that scalable, explainable systems that integrate human knowledge are needed. It was concluded that the integration of BI data analytics with human control would result in more flexible and effective maintenance regimes, which would directly improve the performance of smart industries.

**Zhang, (2024)** investigated the impact of the maturity of business intelligence on the efficiency and performance of manufacturing companies. The research focused on determining the presence of an improved operational outcome when advanced BI maturity is considered. The result based on survey data and the maturity assessment model revealed that the greater the BI maturity, the better the operational efficiency and quality of the decision. The research has found that the BI maturity is the most important area to be developed to get the long-term operational performance improvements.

**Ziora, (2023)** explored the relationship between the maturity of business intelligence and the efficiency of operations and the quality of decisions. The purpose of the study was to determine whether an increase in the level of BI maturity results in an improvement in the operational outcomes. The research conducted through survey data and maturity assessment models identified that organizations who had mature BI systems realised an increase in their level of operational efficiency and better decision accuracy. The results highlighted that BI maturity enhances the use of analytics and control of operations. The study concluded that developing BI maturity is essential for sustained operational efficiency.

## III. RESEARCH METHODOLOGY

This study adopts a descriptive research design. Convenience sampling is adopted in this study. Both primary data and secondary data are applied to the study. The size of the sample to be used in this study is 120 respondents. Simple percentage analysis, chi square analysis and correlation has been used in this study.

### Data analysis and interpretation

**Table No. 1 BI TOOL USABILITY**

Statements	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree	Total
The business intelligence tool interface is intuitive and user-friendly	35 (29.2%)	52 (43.3%)	18 (15%)	9 (7.5%)	6 (5%)	120 (100%)
Navigating through different BI features is simple and straightforward	33 (27.5%)	50 (41.7%)	20 (16.7%)	10 (8.3%)	7 (5.8%)	120 (100%)

The system provides visualizations and dashboards that are easy to interpret	36 (30%)	48 (40%)	19 (15.8%)	10 (8.3%)	7 (5.8%)	120 (100%)
The BI software allows quick access to the required data and reports	34 (28.3%)	51 (42.5%)	18 (15%)	11 (9.2%)	6 (5%)	120 (100%)
The BI system design supports non-technical users in generating reports	32 (26.7%)	49 (40.8%)	21 (17.5%)	11 (9.2%)	7 (5.8%)	120 (100%)

Source: Primary data

**Interpretation**

Respondents reveal that 29.2% strongly agree and 43.3% agree that the business intelligence tool interface is intuitive and user-friendly, while 15% are neutral, 7.5% disagree, and 5% strongly disagree. Regarding navigating through different BI features, 27.5% strongly agree and 41.7% agree that it is simple and straightforward, with 16.7% neutral, 8.3% disagree, and 5.8% strongly disagree. For the system’s visualizations and dashboards, 30% strongly agree and 40% agree that they are easy to interpret, while 15.8% remain neutral, 8.3% disagree, and 5.8% strongly disagree. In terms of accessing required data and reports, 28.3% strongly agree and 42.5% agree that the BI software allows quick access, with 15% neutral, 9.2% disagree, and 5% strongly disagree. Finally, 26.7% strongly agree and 40.8% agree that the BI system design supports non-technical users in generating reports, while 17.5% are neutral, 9.2% disagree, and 5.8% strongly disagree. Overall, the majorities of respondents perceive the BI tool as user-friendly, accessible, and supportive for efficient data analysis and report generation.

**Table No. 2 DATA QUALITY AND ACCESSIBILITY**

Statements	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree	Total
Reports generated by the BI tool are based on up-to-date data	37 (30.8%)	50 (41.7%)	18 (15%)	8 (6.7%)	7 (5.8%)	120 (100%)
Data access permissions are appropriately managed within the organization	35 (29.2%)	52 (43.3%)	20 (16.7%)	7 (5.8%)	6 (5%)	120 (100%)
The system ensures minimal duplication or inconsistency in data	34 (28.3%)	48 (40%)	22 (18.3%)	10 (8.3%)	6 (5%)	120 (100%)
Required data can be retrieved quickly through the BI platform	36 (30%)	51 (42.5%)	18 (15%)	9 (7.5%)	6 (5%)	120 (100%)
The BI system supports real-time or near real-time data processing	33 (27.5%)	50 (41.7%)	21 (17.5%)	10 (8.3%)	6 (5%)	120 (100%)

Source: Primary data

**Interpretation**

Respondents reveal that 30.8% strongly agree and 41.7% agree that reports generated by the BI tool are based on up-to-date data, while 15% are neutral, 6.7% disagree, and 5.8% strongly disagree. Regarding data access permissions, 29.2% strongly agree and 43.3% agree that they are appropriately managed within the organization, with 16.7% neutral, 5.8% disagree, and 5% strongly disagree. For minimizing duplication or inconsistency, 28.3% strongly agree and 40% agree that the system ensures reliable and accurate data, while 18.3% are neutral, 8.3% disagree, and 5% strongly disagree. In terms of retrieving required data quickly, 30% strongly agree and 42.5% agree that the BI platform supports fast and

efficient data access, with 15% neutral, 7.5% disagree, and 5% strongly disagree. Finally, 27.5% strongly agree and 41.7% agree that the BI system supports real-time or near real-time data processing, while 17.5% remain neutral, 8.3% disagree, and 5% strongly disagree. Overall, the majority of respondents perceive that the BI system effectively supports high-quality, accessible, and timely data, which is critical for accurate reporting and informed decision-making.

**Table No. 3 OPERATIONAL EFFICIENCY**

Statements	Excellent	Good	Average	Bad	Poor	Total
Staff scheduling and workforce allocation have become more effective	32 (26.7%)	50 (41.7%)	22 (18.3%)	10 (8.3%)	6 (5%)	120 (100%)
Procurement decisions are better aligned with demand forecasting	30 (25%)	48 (40%)	24 (20%)	10 (8.3%)	8 (6.7%)	120 (100%)
Daily operations are more streamlined due to data insights from BI	35 (29.2%)	52 (43.3%)	20 (16.7%)	8 (6.7%)	5 (4.2%)	120 (100%)
Time required for routine reporting and analysis has been reduced	34 (28.3%)	50 (41.7%)	22 (18.3%)	9 (7.5%)	5 (4.2%)	120 (100%)
BI insights have contributed to reducing waste and resource misuse	33 (27.5%)	51 (42.5%)	21 (17.5%)	10 (8.3%)	5 (4.2%)	120 (100%)

Source: Primary data

### Interpretation

Respondents reveal that 26.7% consider staff scheduling and workforce allocation as excellent and 41.7% consider it good, while 18.3% rate it average, 8.3% bad, and 5% poor. Regarding procurement decisions, 25% rate them as excellent and 40% as good, with 20% average, 8.3% bad, and 6.7% poor. For daily operations streamlined through BI insights, 29.2% rate them as excellent and 43.3% as good, while 16.7% are average, 6.7% bad, and 4.2% poor. In terms of time required for routine reporting and analysis, 28.3% consider it excellent and 41.7% good, with 18.3% average, 7.5% bad, and 4.2% poor. Finally, 27.5% rate the contribution of BI insights in reducing waste and resource misuse as excellent and 42.5% as good, while 17.5% are average, 8.3% bad, and 4.2% poor. Overall, the majority of respondents perceive that BI has significantly enhanced operational efficiency by improving workforce allocation, aligning procurement with demand, streamlining daily operations, reducing reporting time, and minimizing waste.

## IV. CHI-SQUARE ANALYSIS: RELATIONSHIP BETWEEN BI TOOL USABILITY AND OPERATIONAL EFFICIENCY

### HYPOTHESIS TESTING

**Null hypothesis (H0):** There is no significant relationship between BI tool usability and operational efficiency.

**Alternative hypothesis (H1):** There is some significant relationship between BI tool usability and operational efficiency.

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
BI Tool Usability * Operational Efficiency	120	100.0%	0	.0%	120	100.0%

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	179.624 <sup>a</sup>	154	0.077
Likelihood Ratio	138.577	154	0.808
Linear-by-Linear Association	1.064	1	0.302
N of Valid Cases	120		

a. 180 cells (100.0%) have expected count less than 5. The minimum expected count is .01.

**INTERPRETATION:**

The Pearson Chi-Square value is 179.624 with 154 degrees of freedom, and the corresponding p-value is 0.077. Since this p-value is greater than the 0.05 significance level, we reject alternate hypothesis and accept the null hypothesis. This means that, there is no statistically significant relationship between BI tool usability and operational efficiency.

**V. CORRELATION ANALYSIS: RELATIONSHIP BETWEEN DATA QUALITY AND ACCESSIBILITY AND OPERATIONAL EFFICIENCY**

**HYPOTHESIS TESTING**

**Null hypothesis (H<sub>0</sub>):** There is no significant relationship between data quality and accessibility and Operational Efficiency.

**Alternative hypothesis (H<sub>1</sub>):** There is some significant relationship between data quality and accessibility and Operational Efficiency.

Correlations			
		Data Quality and Accessibility	Operational Efficiency
Data Quality and Accessibility	Pearson Correlation	1	.418**
	Sig. (2-tailed)		0
	N	120	120
Operational Efficiency	Pearson Correlation	.418**	1
	Sig. (2-tailed)	0	
	N	120	120

\*\* . Correlation is significant at the 0.01 level (2-tailed).

**INTERPRETATION:**

The Pearson correlation coefficient between the two variables is 0.418, indicating a very weak positive relationship. However, the significance value (p-value) is 0, which is greater than the 0.05 significance level. Because the p-value exceeds 0.05, we accept null hypothesis. At the 5% significance level, there is no significant relationship between data quality and accessibility and operational efficiency.

**VI. SUGGESTIONS**

- The company should focus on enhancing user-friendly features in the BI system to better support non-technical users in generating reports.
- The company must provide regular training programs to improve employees’ understanding and effective usage of BI tools.
- The company should enhance integration between BI tools and other internal systems to minimize data transfer issues.
- The company must ensure smooth synchronization between BI platforms and CRM systems for better customer insights.
- The company should regularly monitor and optimize data access permissions to maintain data security and proper control.

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- The company should strengthen integration with POS and accounting systems to ensure seamless business operations.
- The company should use BI insights more effectively to improve workforce planning and staff scheduling.
- The company must leverage BI tools to align procurement decisions closely with demand forecasting.
- The company should continuously utilize BI insights to streamline daily operations and reduce waste and resource misuse.

**VII. CONCLUSION**

The study found that employees are generally satisfied with the usability and functionality of business intelligence tools in Chennai. It revealed that most respondents perceive BI systems as effective in improving data access, reporting, and visualization. The findings showed that integration with internal systems and real-time data processing is fairly efficient. It revealed that BI tools have positively influenced operational areas such as scheduling, procurement, and daily workflows. The study concluded that business intelligence plays a significant role in enhancing operational efficiency within the organization. It suggested that further improvements in system usability, integration, and training can strengthen overall performance.

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