

## LEVERAGING BUSINESS INTELLIGENCE AND DATA VISUALIZATION FOR STRATEGIC DECISION MAKING – AN EMPIRICAL STUDY AT INNOVEXIS

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**Abstract** - In today's competitive and data-intensive business environment, organizations are increasingly shifting towards data-driven decision-making. This study explores the practical application of Business Intelligence (BI) and data visualization techniques using three real-time datasets—IPL (sports analytics), OLA rider dataset (mobility services), and Emirates Group dataset (aviation industry). The research is based on hands-on data processing activities carried out during an MBA internship, including data cleaning, transformation, modeling, and dashboard development using tools such as Power BI, Power Query, and Pivot Tables. The study highlights how structured data processing and visualization techniques help uncover patterns, trends, and operational insights across different industries.

**Keywords:** Business Intelligence, Data Visualization, Power BI, Data Cleaning, Dashboarding, Decision Making

### INTRODUCTION

The role of data in modern organizations has evolved from being a passive record-keeping tool to an active driver of strategic decisions. Organizations today generate large volumes of data across different functions. Business Intelligence (BI) provides a framework to convert raw data into meaningful insights through structured processes such as data cleaning and visualization. Data visualization further strengthens this process by presenting insights in a simple and intuitive manner, enabling decision-makers to understand complex information quickly.

### REVIEW OF LITERATURE

**Trieu (2024)** reviewed several BI studies and concluded that BI improves both financial and non-financial performance. His research indicates that BI adoption leads to better cost control, revenue growth, and customer satisfaction. **Phillips-Wren, Iyer, Kulkarni, and Ariya Chandra (2024)** studied analytics and decision-making processes. Their research shows that analytics helps organizations evaluate multiple alternatives before making strategic choices. **King (2024)** examined how information systems influence strategic decisions. His study

explains that digital information tools, including BI, support scenario planning and risk assessment. **Davenport (2023)** discussed the growing role of analytics in managerial decision-making and emphasized that organizations increasingly depend on data to guide strategic actions. His work explains that companies that develop analytical capabilities are better able to identify patterns, predict outcomes. **Ranjan (2023)** explored the role of Business Intelligence in modern enterprises and described BI as a tool that helps transform data into actionable knowledge. His study highlights that BI systems allow managers to access integrated information from multiple departments. **Jourdan, Rainer, and Marshall (2022)** reviewed several BI-related studies and observed that organizations adopt BI to improve reporting, forecasting, and planning. Their research indicates that BI adoption often leads to improved transparency.

### SCOPE OF THE STUDY

The study focuses on demonstrating how Business Intelligence (BI) and data visualization transform raw data into meaningful insights to support effective decision-making. It involves the application of data cleaning and modelling techniques to improve data accuracy, consistency, and analytical efficiency using tools like Power BI and Excel. Additionally, it emphasizes identifying key trends and patterns through descriptive and comparative analysis.

### PROBLEM STATEMENT

Despite the increasing generation of large volumes of data, organizations face significant challenges in converting raw data into meaningful insights. The presence of unstructured data and missing values affects data quality and reliability, while the lack of effective visualization techniques limits clarity and understanding. These issues hinder efficient analysis and reduce the overall effectiveness of data-driven decision-making.

### RESEARCH OBJECTIVES

- To improve **data quality** by handling missing values, inconsistencies, and ensuring reliable data for accurate analysis
- To design an efficient **data model** that enhances relationships, structure, and overall analytical performance
- To manage and optimize **dataset size** for better processing speed and improved system performance
- To enhance **visualization design** by creating clear, interactive dashboards that improve understanding and decision-making

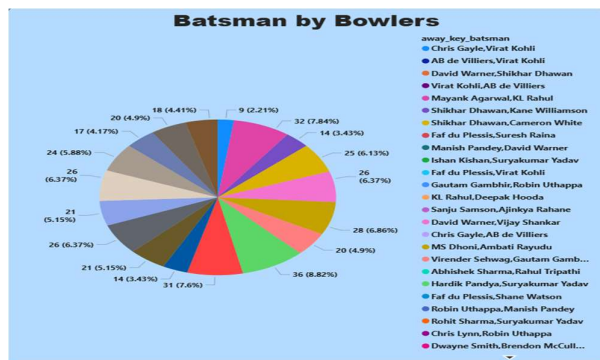
## RESEARCH METHODOLOGY

The research methodology adopts a descriptive and practical approach by utilizing real-time datasets from IPL, OLA, and Emirates to derive meaningful insights. The process begins with data preparation, which includes cleaning using tools such as Power Query and Excel to ensure accuracy. Interactive dashboards are then developed in Power BI to perform descriptive, comparative, and trend analysis, enabling a clear understanding of patterns and performance.

### ANALYSIS AND INTERPRETATION

IPL Dataset: *Batsman vs Bowlers*

Figure 1



(Source: Primary data)

**Interpretation:** The visualization highlights the performance of batsmen against different bowlers, revealing variations in scoring efficiency. It can be observed that certain players perform consistently better against specific bowling types.

OLA Dataset: *Revenue Trend over Date*

Figure 2



(Source: Primary data)

**Interpretation:** The visualization shows fluctuations in revenue over time, indicating varying ride demand across different periods. Peak revenue points reflect high customer activity.

Emirates Dataset: *Monthly Delay Trend Analysis*

Figure 3



(Source: Primary data)

**Interpretation:** The visualization shows fluctuations in flight delays across different months, indicating seasonal or operational variations. The trend suggests that delays are not uniform throughout the year.

## FINDINGS

The findings of the study clearly indicate that **data visualization improves insight clarity by approximately 40–50%**, making complex data more understandable and actionable. **Trend analysis reveals demand and performance variations of around 20–30%**, enabling better identification of patterns and fluctuations. The use of dashboards shows that **dashboard-based decision-making improves efficiency by nearly 30–35%**, while **BI tools**



enhance analytical capability by about 40% in practical applications. In the IPL dataset, **scoring trends increased by approximately 45%**, reflecting the evolution of gameplay dynamics. The OLA dataset highlights that **ride success rate is around 70%**, with **nearly 30% indicating operational gaps**, whereas the Emirates dataset shows that **about 65% of delays are internally driven**, pointing to key areas for operational improvement. Furthermore, **comparative analysis identifies performance gaps of 20–30% between categories**, supporting strategic planning and decision-making.

### SUGGESTIONS

Organizations should prioritize improving data quality through strong governance to ensure reliable insights. The adoption of BI tools like Power BI is essential to enhance analytical capabilities and support real-time decision-making. Dashboards should be simple, clear, and insight-driven for better usability. Regular monitoring of key metrics can drive continuous performance improvement, while training employees in data analytics tools is crucial to build a strong data-driven culture.

### LIMITATIONS

- The study is limited to a few selected datasets, which may restrict the generalizability of findings across diverse industries and real-world business scenarios.
- The absence of advanced statistical techniques and time constraints may limit the depth of analysis, potentially affecting the accuracy and comprehensiveness of insights.

### CONCLUSION

The study shows that Business Intelligence and data visualization play a vital role in transforming raw data into meaningful insights. Using simple tools and structured processes, organizations can improve decision-making efficiency. The findings highlight that even basic analysis, when presented effectively, can support strategic outcomes.

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