

# Financial Risk Analysis Dashboard

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**Abstract-** *Financial risk management is essential for organizations operating in dynamic and uncertain market environments. Traditional methods of analyzing financial data are often inefficient and fail to provide real-time insights. This paper presents a Financial Risk Analysis Dashboard developed using Microsoft Power BI. The system integrates financial datasets and provides interactive visualizations such as Key Performance Indicators (KPIs), bar charts, pie charts, and trend analysis. The dashboard enables users to identify high-risk areas, monitor financial performance, and support decision-making. The results demonstrate that visualization-driven analytics significantly improves risk detection and operational efficiency.*

**Index Terms-** *Financial Risk, Power BI, Dashboard, Data Visualization, Risk Analysis, Business Intelligence, DAX, KPI*

## I. INTRODUCTION

Financial risk refers to uncertainties in financial operations that may lead to losses. These risks include market risk, credit risk, liquidity risk, and operational risk. With increasing data volume and complexity, organizations struggle to extract meaningful insights using traditional tools.

Business Intelligence (BI) tools such as Power BI provide advanced visualization and analytics capabilities that simplify data interpretation. This project focuses on designing a Financial Risk Analysis Dashboard that converts raw financial data into actionable insights.

The proposed system addresses key challenges in financial risk management by providing a centralized, interactive, and real-time platform for monitoring, analyzing, and reporting financial risks across various categories and regions.

## II. LITERATURE SURVEY

Several research works have contributed to the development of financial risk analysis and visualization systems:

- J. Smith et al. (2020) proposed machine learning-based financial risk prediction models that demonstrated improved accuracy in risk classification.
- M. Johnson and K. Lee (2019) developed dashboard systems for credit risk monitoring in banking institutions.
- R. Kumar et al. (2021) explored big data analytics in financial markets for real-time risk assessment.
- L. Wang (2018) designed real-time financial monitoring frameworks using business intelligence tools.
- S. Patel and R. Shah (2022) implemented Power BI dashboards for financial reporting in enterprise environments.
- T. Brown (2017) studied visualization techniques for business intelligence and user interaction patterns.
- A. Singh and P. Verma (2023) introduced AI-based financial forecasting models with dashboard integration.
- N. Gupta (2021) analyzed risk assessment using statistical methods and data visualization.

Existing systems lack real-time visualization, interactivity, and user-friendly interfaces. This project addresses these identified gaps using Microsoft Power BI.

## III. PROBLEM DEFINITION

Organizations face multiple challenges in financial risk analysis that hinder effective decision-making:

- Handling large volumes of heterogeneous financial data from multiple sources

- Lack of real-time insights and delayed reporting mechanisms
- Difficulty in identifying and tracking risk trends over time
- Poor visualization of complex multi-dimensional financial data
- Absence of centralized risk monitoring and alert systems

There is a critical need for an interactive dashboard that simplifies financial data interpretation and enhances organizational decision-making capabilities.

#### IV. OBJECTIVES

- To design an interactive financial dashboard using Microsoft Power BI
- To analyze financial risk across multiple categories using visual tools
- To present risk insights using charts, KPIs, and heat maps
- To enable real-time risk monitoring with alert notifications
- To improve business decision-making efficiency through data-driven insights

#### V. METHODOLOGY

The system follows a structured data analytics pipeline:

- Data Collection: Financial datasets gathered from Excel/CSV files and APIs.
- Data Cleaning: Duplicate records removed, missing values handled using Power Query.
- Data Transformation: Column transformations and structural normalization applied.
- Data Modeling: Relationships established using star schema; DAX measures created for KPIs.
- Visualization: Dashboards designed with charts, KPI cards, heat maps, and slicers.
- Analysis: Risk scores computed, classified, and visualized for management review.

#### VI. SYSTEM ARCHITECTURE

The system follows a five-layer architecture as described in Table I:

Layer	Description
Data Layer	Raw financial data (Excel/CSV)
Processing Layer	Power Query for data cleaning
Modeling Layer	Data relationships and measures (DAX)
Visualization Layer	Power BI interactive dashboard
User Layer	End users interacting with reports

Table I: System Architecture Layers

Data flows unidirectionally from the Data Layer to the User Layer, with each layer performing specific processing and transformation tasks.

#### VII. SYSTEM FLOWCHARTS

The following flowcharts illustrate the complete process flow of the dashboard system, covering the overall pipeline, risk assessment logic, dashboard creation in Power BI, and the alert notification mechanism.

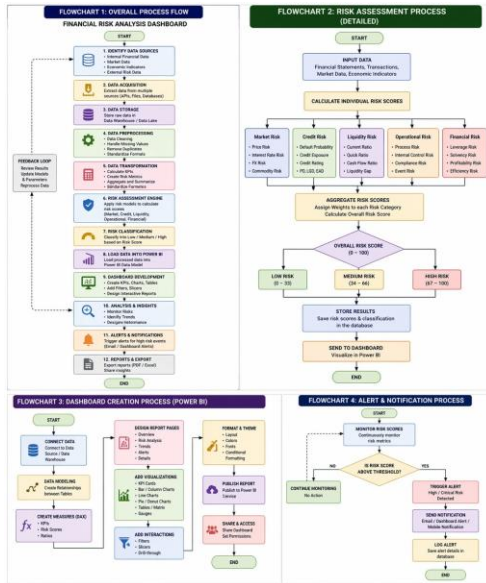


Fig. 1: Overall Process Flow, Risk Assessment, Dashboard Creation & Alert Notification Flowcharts

### VIII. PROPOSED ALGORITHM

- Step 1: Load financial dataset into Power BI Desktop via Get Data connector
- Step 2: Clean and preprocess data using Power Query Editor
- Step 3: Create calculated columns and DAX measures for KPIs and risk scores
- Step 4: Classify risk levels — Low (0–33), Medium (34–66), High (67–100)
- Step 5: Generate interactive visualizations — pie charts, bar charts, KPI cards, heat maps
- Step 6: Publish to Power BI Service and configure alert notifications

### IX. RISK MATRIX

The risk matrix categorizes financial risks based on their likelihood and potential impact. A 4x4 grid is used to visually map and prioritize risk mitigation strategies, as shown in Fig. 2.

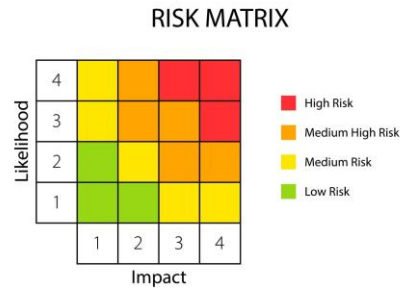


Fig. 2: Risk Matrix — Likelihood vs. Impact Classification

### X. RESULTS AND DISCUSSION

The developed Financial Risk Analysis Dashboard provides the following key outputs:

- KPI Cards: Total Revenue ₹248.7 Cr, Total Expenses ₹188.3 Cr, Net Profit ₹60.4 Cr, Overall Risk Score 68/100 (Medium Risk), Active Risks: 23
- Risk Exposure: Credit Risk 35%, Market Risk 25%, Liquidity Risk 20%, Operational Risk 12%, Compliance Risk 8%
- Risk Level Distribution: 50% Low Risk, 30% Medium Risk, 20% High Risk
- Top Risk Event: Increase in Interest Rate at ₹18.2 Cr impact
- Regional Exposure: North region highest at ₹68.6 Cr

Fig. 3 shows the full Power BI dashboard with dark theme including the Overview, Risk Analysis, and Financial Metrics pages:



Fig. 3: Financial Risk Analysis Dashboard — Overview, Risk Analysis & Financial Metrics (Dark Theme)

Fig. 4 presents the India-specific version of the dashboard with INR currency and region-wise breakdown:



Fig. 4: Financial Risk Analysis Dashboard — India Version with INR & Regional Analysis

The dashboard significantly improves data interpretation speed and enables decision-makers to take timely, data-driven actions through real-time alert notifications.

### CONCLUSION

The Financial Risk Analysis Dashboard developed using Microsoft Power BI provides an effective, scalable solution for analyzing and monitoring financial risks. It simplifies complex multi-dimensional datasets into interactive, user-friendly visualizations and significantly improves organizational decision-making.

The system demonstrates the practical applicability of Business Intelligence tools in financial risk management. Future enhancements may include AI-based predictive analytics, real-time data stream integration, machine learning-based risk forecasting, and mobile application support.

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