

Credit Risk Analysis and Financial Dashboard

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Abstract: *In the financial sector, identifying high-risk customers is essential for minimizing losses and improving decision-making. This research presents a Credit Risk Analysis system that utilizes data analytics techniques to analyze customer financial data and identify potential risk factors. The study involves data preprocessing using Python, data management using SQL, and visualization using Power BI to create an interactive dashboard. The system analyzes key attributes such as income, credit score, loan amount, and delinquency status to classify customers into different risk categories. The developed dashboard provides insights into customer risk distribution, loan analysis, and delinquency trends. The results demonstrate that data analytics combined with visualization tools can significantly improve the efficiency and accuracy of financial decision-making systems.*

Keywords: *financial sector*

I. INTRODUCTION

In today's data-driven world, financial institutions rely heavily on data analytics to assess risks and make informed decisions. Credit risk analysis plays a vital role in identifying customers who may fail to repay loans. Traditional methods of risk assessment are often time-consuming and less efficient when dealing with large datasets.

This research focuses on developing a system that automates the process of credit risk analysis using modern data analytics tools. By integrating Python, SQL, and Power BI, the system provides a structured approach to analyzing financial data and generating meaningful insights.

II. LITERATURE REVIEW

Several studies have highlighted the importance of data analytics in financial systems. Previous research emphasizes the use of machine learning and statistical techniques for predicting credit risk. Data visualization tools such as Power BI and Tableau have also been widely used to present complex data in an understandable format.

Research on financial data analysis shows that combining data preprocessing, analysis, and visualization improves decision-making efficiency. This study builds upon these concepts by integrating multiple tools to create a comprehensive credit risk analysis system.

III. METHODOLOGY

The methodology of the proposed system involves multiple stages:

Data Collection: Financial datasets containing customer details such as income, credit score, loan type, and delinquency status are collected.

Data Preprocessing: Python libraries such as Pandas and NumPy are used to clean and transform the data by handling missing values and removing inconsistencies.

Data Storage: The processed data is stored in a structured format using SQL for efficient querying and management.

Data Analysis: Analytical techniques are applied to identify patterns, trends, and risk levels among customers.

Data Visualization: Power BI is used to create interactive dashboards for presenting insights visually.

IV. RESULTS AND DISCUSSION

The results of the analysis are presented through a Power BI dashboard that includes multiple visualizations:

Customer Distribution by Risk Level: Shows how customers are categorized into low, medium, and high-risk groups.



Loan Amount Analysis: Displays the distribution of loan amounts across different loan types and risk categories.

Delinquency Analysis: Highlights trends in loan defaults over time.

The dashboard provides a clear and interactive representation of financial data, enabling users to understand patterns and make informed decisions. The analysis reveals that customers with lower credit scores and higher debt levels are more likely to be high-risk.

V. CONCLUSION

The study successfully demonstrates the use of data analytics in credit risk analysis. By integrating Python, SQL, and Power BI, the system efficiently processes financial data and generates meaningful insights.

The developed dashboard simplifies complex data and enhances decision-making capabilities. The project also highlights the importance of data-driven approaches in financial systems and their potential to improve risk management strategies.

VI. FUTURE SCOPE

The system can be further enhanced by integrating machine learning algorithms for predictive analysis. Real-time data integration can also be implemented to provide dynamic insights.

Additionally, the system can be expanded to include more financial parameters and deployed as a web-based application for better accessibility. Ongoing work on database management in application-based systems, such as a Child Control Application, can further contribute to improving system scalability and performance.

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