

Design and Development of an Interactive MIS Dashboard for Cooperative Bank Branch Operations Using Power BI

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Abstract—The banking sector generates large volumes of operational and financial data through daily activities such as deposits, loans, and customer transactions. Analyzing this data effectively is essential for improving decision-making and monitoring the financial performance of bank branches. This study presents the design and development of an interactive Management Information System (MIS) dashboard for cooperative bank branch operations. The system transforms raw banking data into meaningful insights by integrating data processing, analytical calculations, and visual reporting. The dashboard was developed using Microsoft Power BI, where banking datasets related to deposits and loans were cleaned and structured using Power Query, and key financial indicators were calculated using DAX measures.

The developed dashboard provides visual representations of important banking metrics such as deposit distribution, CASA performance, loan outstanding amounts, and loan collection trends. Interactive charts, KPI indicators, and filtering options enable users to analyze financial performance quickly and efficiently. The proposed system improves the efficiency of financial analysis by presenting complex banking data in a clear visual format, thereby supporting better monitoring and decision-making for cooperative bank management.

Index Terms--Management Information System, Power BI, Cooperative Bank, Key Performance Indicator(KPI).

I. INTRODUCTION

The banking industry generates a large volume of financial and operational data through daily activities such as deposits, loan processing, customer transactions, and account management. Managing and analyzing this data effectively is essential for monitoring financial performance and improving decision-making within banking institutions. Traditional reporting methods often rely on

spreadsheets and manual data analysis, which can make it difficult to interpret large datasets quickly. Therefore, modern banking systems are increasingly adopting data analytics and visualization tools to transform raw financial data into meaningful insights. Banking data analytics plays an important role in understanding financial trends, customer behaviour, and operational performance. By analyzing data related to deposits, loans, and customer accounts, banks can identify patterns and evaluate the effectiveness of their services. Analytical dashboards provide a centralized platform where key financial indicators can be monitored easily. These dashboards help bank managers track important metrics such as deposit distribution, loan portfolio performance, and collection activities, enabling faster and more accurate decision-making.

Management Information Systems (MIS) are widely used in banking organizations to collect, process, and present operational data in a structured format. An MIS dashboard helps summarize financial activities and display key performance indicators in a single interface. Instead of reviewing multiple reports separately, bank staff can access summarized information through a visual dashboard. Business intelligence tools such as Microsoft Power BI provide advanced visualization capabilities that convert complex numerical data into charts, graphs, and interactive dashboards, making financial analysis easier to understand.

The dashboard visualizes banking datasets related to deposits and loan portfolios and presents them through charts, tables, and key performance indicators. The final dashboard is embedded into an HTML webpage and executed locally using Visual Studio Code with the Live Server extension to simulate a web-based reporting interface. The proposed system demonstrates how modern data visualization tools can improve

financial monitoring and support better decision-making in the banking sector.

II. LITERATURE REVIEW

Several studies have emphasized the importance of business intelligence and data analytics in improving financial decision-making within banking institutions.

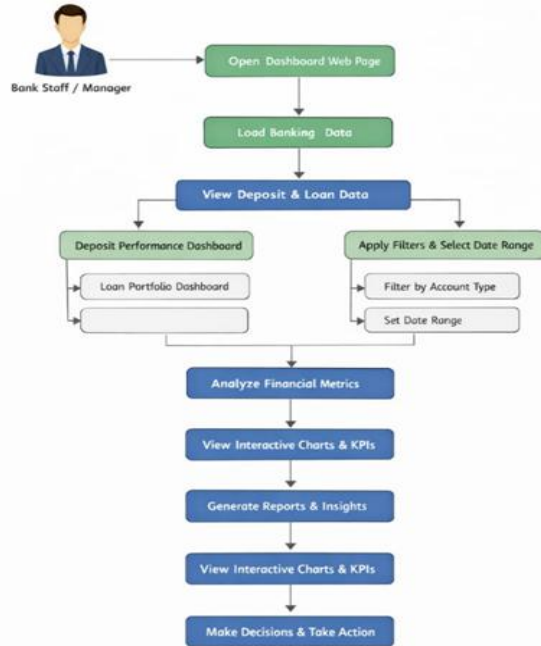


Fig.1.1 System Flow

Studies [1] and [2] highlight that business intelligence systems help organizations transform large volumes of financial data into meaningful insights. These systems enable bank managers to monitor key financial indicators and evaluate performance through structured analytical reports. Similarly, research [3] demonstrates that interactive dashboards provide clear visual representations of financial information, allowing organizations to analyze financial performance more effectively and support data-driven decision-making.

Research studies [4], [5], and [6] further explain the role of data visualization and analytical dashboards in improving operational efficiency and reporting systems. These studies show that integrating business intelligence tools into financial systems allows organizations to generate dynamic reports and improve monitoring of banking activities. Visualization tools such as Microsoft Power BI enable users to convert complex numerical datasets into

graphical formats, making it easier to identify trends, compare performance indicators, and evaluate operational outcomes.

Other research works [7] and [8] focus on the use of data analytics for improving managerial decision-making in financial institutions. These studies indicate that analyzing banking datasets through structured analytical methods helps managers understand customer behaviour, financial trends, and operational performance. Exploratory data analysis techniques also assist organizations in identifying patterns within financial data, which supports more accurate planning and strategic decision-making in banking environments.

Recent advancements in dashboard technologies are discussed in studies [9] and [10], which explore the development of intelligent dashboard systems and decision-support platforms. These studies highlight that modern analytical dashboards integrate data processing, visualization, and reporting capabilities to provide comprehensive insights into organizational performance. Such dashboard-based systems improve the accessibility of financial information and enable managers to monitor operational activities through interactive visual interfaces, thereby enhancing decision-making processes in banking organizations.

III. PROBLEM STATEMENT

In many cooperative banks, financial data related to deposits, loans, and customer accounts is usually maintained through traditional reporting methods such as spreadsheets and manual record systems. These methods often make it difficult for bank staff and management to analyze large volumes of data efficiently. Since the information is mostly presented in tabular form, identifying trends, comparing financial indicators, and monitoring overall branch performance becomes time-consuming and complex.

Another challenge in the existing system is the lack of a centralized platform that can present important financial metrics in a single view. Bank managers often need to review multiple reports separately to understand deposit distribution, loan portfolio performance, and collection status. This fragmented reporting process reduces the efficiency of decision-making and may delay important financial evaluations.

Therefore, there is a need for an interactive and visual

reporting system that can transform raw banking data into meaningful insights.

IV. PROPOSED WORK

The proposed system aims to develop an interactive Management Information System (MIS) dashboard that helps analyze and visualize banking data related to deposits and loans. The system converts raw banking data into meaningful visual insights that allow bank staff and management to easily monitor financial performance. By integrating data processing and visualization techniques, the proposed dashboard provides a clear and structured view of important financial indicators within the bank branch.

In this system, banking datasets containing information about deposit accounts, CASA categories, loan schemes, and collection details are processed and analyzed using Microsoft Power BI. Data transformation and cleaning are performed using Power Query to ensure accuracy and consistency in the dataset. Analytical measures are then created to calculate key financial metrics such as total deposits, loan outstanding balances, and collection performance. These calculations help in evaluating the financial status and operational efficiency of the bank. The processed data is presented through interactive visualizations including charts, tables, and key performance indicators in a dashboard interface. The dashboard enables users to analyze deposit distribution, monitor loan portfolio performance, and compare financial data across different banking categories. Filters and slicers allow users to explore the data dynamically and obtain detailed insights from the visual reports.

To simulate a web-based reporting environment, the final dashboard is embedded into an HTML webpage and executed locally using Visual Studio Code with the Live Server extension. This approach allows the dashboard to be viewed through a web browser, providing a simple interface for accessing financial insights. The proposed system improves financial monitoring, simplifies data analysis, and supports better decision-making in cooperative bank branch operations.

Fig.5.1 System Flow Diagram

V. SYSTEM ARCHITECTURE

The system flow illustrates the sequence of operations involved in generating the MIS dashboard for cooperative bank branch analysis. Initially, the banking dataset containing information about deposits, loans, and customer account details is collected and stored in spreadsheet format using Microsoft Excel. This dataset acts as the primary data source for the system. The raw data is then imported into the analytical environment where it undergoes preprocessing and cleaning to remove inconsistencies and prepare the data for further analysis.

After the preprocessing stage, the cleaned dataset is processed using analytical functions to generate meaningful financial indicators. Finally, the developed dashboard is integrated into a simple web interface to simulate a web-based reporting system.

The system flow demonstrates how raw banking data is transformed into visual insights that support effective monitoring and decision-making in cooperative bank operations.

Furthermore, the visualization layer plays a crucial role in presenting analytical results in an understandable format. Interactive charts, graphs, and key performance indicators are generated to help users easily interpret complex financial information. These visual elements allow bank staff to monitor trends, compare financial metrics, and identify performance patterns. By integrating the analytical and visualization components within the architecture, the system provides a reliable platform for financial monitoring and supports efficient decision-making within the cooperative banking environment.

The system architecture also ensures a structured flow of data between different components of the dashboard system. These datasets are then transferred to the data processing layer, where the information is cleaned, organized, and prepared for analysis. This layered architecture helps maintain data consistency and ensures that only validated data is used for generating reports.

VI. METHODOLOGY

The methodology of this project describes the systematic process followed to design and develop the Management Information System (MIS) dashboard for cooperative bank branch operations. The project begins with the collection of banking data related to deposits, loans, and account categories from internal banking records. This stage ensures that all relevant financial data required for the dashboard is available in a structured format.

The next step involves data preprocessing and transformation. The raw dataset is imported into Microsoft Power BI where data cleaning and transformation are performed using Power Query. During this stage, unnecessary fields are removed, missing values are handled, and the dataset is structured properly to ensure accuracy and consistency. After preprocessing, analytical calculations are performed using DAX measures to generate important financial metrics such as total deposits, CASA distribution, loan outstanding balances, and loan collection performance.

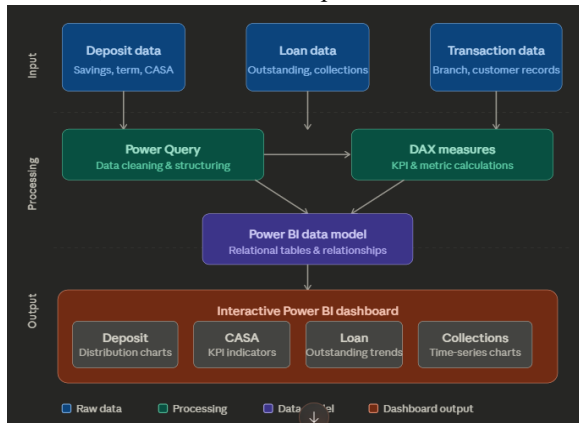


Fig.6.1. Methodology

Once the analytical data is prepared, the next stage focuses on dashboard development. Interactive charts, graphs, tables, and key performance indicators are created within Power BI to visually represent the processed banking data. These visualizations allow users to analyze financial trends, compare banking performance indicators, and monitor branch operations more efficiently. Filters and slicers are also implemented in the dashboard to allow dynamic data exploration. Finally, the developed dashboard is integrated into a web-based interface to simulate an online reporting environment. The methodology ensures that raw banking data is transformed into meaningful visual information that supports effective monitoring and

decision-making.

VII. IMPLEMENTATION TECHNIQUES

The development of the MIS dashboard for cooperative bank branch operations requires several software tools and analytical techniques to process, analyze, and visualize banking data effectively. These tools help transform raw banking datasets into meaningful insights that support financial monitoring and decision-making.

The dataset is then imported into Microsoft Power BI, which serves as the main business intelligence platform for data analysis and dashboard development. Power BI provides features such as Power Query for data cleaning and transformation, and DAX (Data Analysis Expressions) for performing analytical calculations and generating key financial indicators.

This approach simulates a simple web-based reporting environment where bank staff and management can access visual reports and monitor financial performance easily. These tools and techniques collectively help in converting complex banking data into interactive dashboards that improve data analysis and support effective decision-making.

The implementation of the MIS dashboard system was carried out in several stages to ensure proper data processing, analysis, and visualization. Initially, the banking dataset containing information about deposits, loans, and account details was collected and organized in spreadsheet format using Microsoft Excel. The dataset served as the primary data source for the system and included various financial attributes required for analysis. The collected data was reviewed and structured properly to maintain consistency and accuracy before importing it into the analytical environment.

In the next stage, the dataset was imported into



Fig.7.1 Data Flow

Microsoft Power BI for data processing and analysis. Data cleaning and transformation were performed using Power Query to remove unnecessary fields, correct formatting issues, and prepare the dataset for analysis. Analytical calculations were then created

using DAX (Data Analysis Expressions) to generate important financial indicators such as total deposits, loan outstanding balances, and collection performance.

These measures helped in deriving meaningful insights from the raw banking data.

After completing the analytical processing, interactive dashboards were designed in Power BI to present the results visually. Various charts, tables, and key performance indicators were used to display financial metrics related to deposit distribution and loan portfolio performance. This allowed the dashboard to be accessed through a web browser, enabling bank staff and management to view the reports and analyze financial performance efficiently.

Core Components

The MIS dashboard system for cooperative bank branch operations consists of several key components that work together to process banking data and generate meaningful visual insights. Each component performs a specific function in the overall system to ensure accurate data analysis and efficient reporting.

The first component is **Data Collection**, where banking datasets related to deposits, loans, and account information are gathered and stored. In this project, the data is organized using Microsoft Excel, which serves as the primary source of structured financial data. This dataset includes various fields such as account categories, deposit amounts, loan schemes, and collection details that are required for further analysis.

The second component is Data Processing and Analysis, where the collected data is cleaned, transformed, and analyzed to generate meaningful information. The dataset is imported into Microsoft Power BI, where Power Query is used for data cleaning and transformation. Analytical calculations are then performed using DAX measures to derive important financial indicators such as total deposits, loan outstanding balances, and collection performance.

The third component is Data Visualization, which converts the processed data into graphical representations that are easy to understand. Power BI is used to create interactive dashboards that display charts, tables, and key performance indicators.

These visual elements allow users to quickly analyze financial trends, compare deposit and loan categories, and evaluate the performance of banking operations.

The final component is the Web Interface, which provides a platform for accessing the developed dashboard. The dashboard is embedded into an HTML webpage and executed locally using Visual Studio Code with the Live Server extension. This allows bank staff and management to access the dashboard through a web browser and view financial reports in an interactive format, thereby supporting effective monitoring and decision-making.

IX. RESULTS AND DISCUSSION

The developed MIS dashboard effectively converts raw banking data into meaningful visual insights that help analyze the financial performance of the cooperative bank branch. The system processes the dataset and presents important indicators such as total deposits, loan distribution, and collection performance through interactive charts and tables. By using Microsoft Power BI, the dashboard provides a clear visual representation of financial information, making it easier for bank staff to understand and monitor different banking operations. The results show that the use of an interactive dashboard improves the efficiency of financial analysis compared to traditional spreadsheet-based methods. Users can quickly identify trends in deposits and loans and compare different banking categories using filters and visual reports. The dashboard was embedded into an HTML webpage and executed locally using Visual Studio Code with the Live Server extension, allowing the system to run in a web browser.

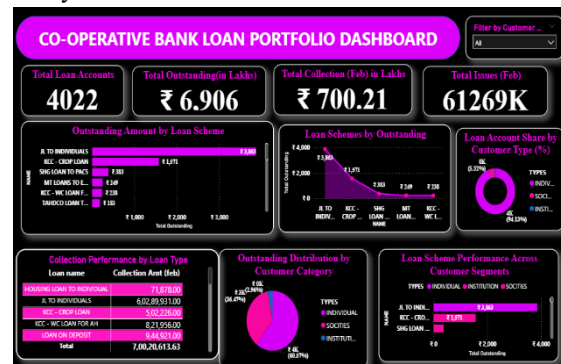


Fig.9.1 Bank Loan Analysis

This implementation demonstrates how business intelligence tools can support better financial

monitoring and assist management in making informed decisions.

XI. FUTURE SCOPE

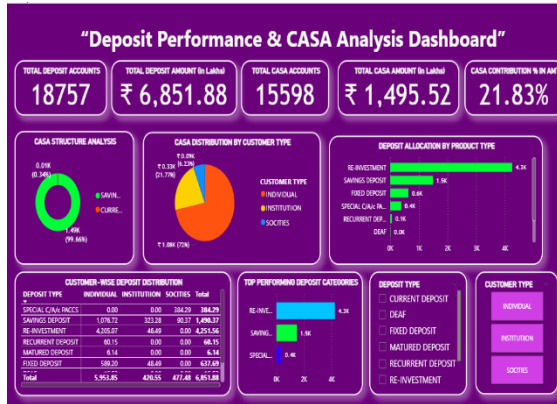
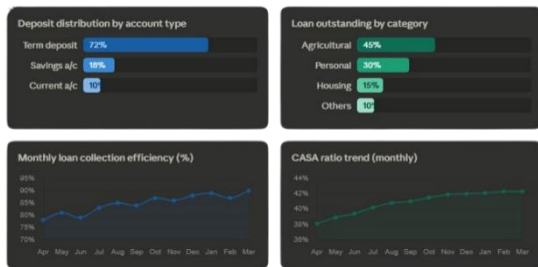


Fig.9.2 Loan Deposit

In the future, the system can be further enhanced by integrating real-time banking databases instead of static datasets. This would allow the dashboard to automatically update financial information and provide live monitoring of banking activities. Additional analytical features such as predictive analytics and trend forecasting can also be incorporated to help management anticipate financial changes and plan strategies accordingly.

Moreover, the dashboard can be deployed as a full web-based or cloud-based application that allows multiple users to access the system securely from different locations. Advanced features such as role-based access control, mobile-friendly dashboards, and automated report generation can be implemented to improve usability and functionality. These enhancements would make the system more scalable and suitable for broader banking operations.



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X. CONCLUSION

The developed MIS dashboard provides an effective solution for analyzing and visualizing banking data in a cooperative bank branch environment. By integrating structured datasets with business intelligence tools, the system converts raw financial data into meaningful visual insights. The dashboard helps in monitoring key banking indicators such as deposit distribution, loan portfolio performance, and collection details through interactive charts and reports created using Microsoft Power BI. The implementation demonstrates that data visualization significantly improves the efficiency of financial analysis and reporting. Instead of manually reviewing large datasets, bank staff can quickly access summarized information through a dashboard interface. The integration of the dashboard into an HTML webpage using Visual Studio Code allows the reports to be viewed through a web browser, providing a simple and accessible platform for financial monitoring. Overall, the system supports better decision-making and enhances the management of banking operations.

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