

# **BANK LOAN DASHBOARD**

## **A PROJECT REPORT**

*Submitted by*

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*Submitted to*

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*in partial fulfillment for the award of the degree of*

## **MASTERS OF COMPUTER APPLICATIONS**

**IN**

**BUSINESS ANALYTICS**



**Chandigarh University**

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## **BONAFIDE CERTIFICATE**

Certified that this project report “ **BANK LOAN DASHBOARD** ” is the bonafide work of “**Shubhangi Srivastava**” who carried out the project work under my/our supervision.

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**MCA**

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**SUPERVISOR**

**MCA**

Submitted for the project viva-voce examination held on \_\_\_\_\_

**INTERNAL EXAMINER**

**EXTERNAL EXAMINER**

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Finally, I would like to express my gratitude to everyone who has supported us in this endeavor. Your encouragement and belief in our capabilities have played a crucial role in our success.

Thank you all for your invaluable contributions and support.

## ABSTRACT

This dashboard provides a comprehensive analysis of bank loan applications, focusing on various key indicators that influence loan approval and repayment. The dataset includes critical information such as loan status, employment details, financial metrics, and borrower demographics. By visualizing these data points, the dashboard aims to identify trends, assess risk levels associated with different loan types, and enhance decision-making processes for loan approvals.

Key features include:

- **Loan Status Analysis:** Differentiation between good and bad loans based on repayment history and borrower attributes.
- **Demographic Insights:** Breakdown of applications by state and purpose, offering insights into geographic and categorical trends.
- **Financial Metrics:** Visualization of annual income, debt-to-income ratios, and loan amounts to assess borrower eligibility and risk.
- **Temporal Analysis:** Tracking loan issuance and payment histories over time to identify patterns and potential areas for improvement in lending practices.

# **CHAPTER – 1**

## **INTRODUCTION**

In today's fast-paced financial landscape, managing and analyzing loan portfolios effectively is essential for financial institutions. As loan applications grow in volume and complexity, the need for clear, insightful, and data-driven tools has become paramount. This dashboard was developed to address the growing demand for an interactive and comprehensive solution that enables institutions to track and manage loan data in real-time. The primary goal of the dashboard is to provide financial institutions with an intuitive interface for monitoring loan applications, understanding loan performance, and identifying potential risks.

The dashboard offers a range of features, including visualizing loan distribution across various parameters such as state, loan purpose, employment status, and loan term. It distinguishes between good loans and bad loans, offering actionable insights into the performance of different loan categories. By providing a holistic view of the loan portfolio, financial institutions can make informed decisions to improve their loan approval process, enhance risk management, and optimize capital allocation. This project report outlines the design and implementation of the loan dashboard, discussing the client's needs, the problems faced, and the solution provided through data visualization and analysis. The dashboard not only offers insights into loan applications and statuses but also provides deeper understanding of critical financial metrics such as interest rates, loan delinquency rates, and debt-to-income ratios. Ultimately, this tool aims to streamline loan management processes, helping financial institutions mitigate risks and maximize returns.

### **1.1 Identification of Client/Need/Relevant Contemporary Issue**

The dashboard has been designed to meet the needs of a financial institution offering loans to various customers. The key purpose of this tool is to provide an interactive and data-driven representation of loan applications, their status, and financial metrics related to loan distribution. The client required a comprehensive view of loan applications, both good and bad, to facilitate informed decision-making. The contemporary issue addressed here is the growing complexity in managing loan portfolios efficiently, especially in times of economic uncertainty where financial risk management becomes crucial. Institutions need a structured analysis to assess loan performance and minimize defaults, ensuring that capital is appropriately allocated while managing bad loans effectively.

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## 1.2 Identification of Problem

The client was facing challenges in understanding the distribution and performance of various loans over time. Without a proper visualization tool, it was difficult to track metrics such as loan applications, funded amounts, interest rates, and delinquency rates by different criteria, such as geography or loan purposes. The primary problem identified was the absence of an aggregated view of loan data that could help in better forecasting, identifying potential risks, and taking actions in time to minimize bad loan issuance. Additionally, the institution lacked insights into customer loan behavior, such as the relation between income, employment, and home ownership with loan repayment success.

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## 1.3 Identification of Tasks

Several tasks were identified in the development of this dashboard:

- **Data Collection & Cleaning:** The raw data required extraction from multiple sources and preprocessing to ensure uniformity in formats and accurate analysis.
- **Dashboard Design:** A user-friendly interface was designed to present key financial metrics, including loan applications by month, state, and employee length, along with funded and received amounts.
- **Loan Analysis:** Various financial metrics, such as interest rates, DTI (Debt-to-Income ratio), and loan application types, needed to be calculated to understand good vs bad loans.
- **Data Visualization:** The design required the use of graphical representations, such as line charts, maps, and pie charts, to provide a clear and interactive way to assess data across different variables.

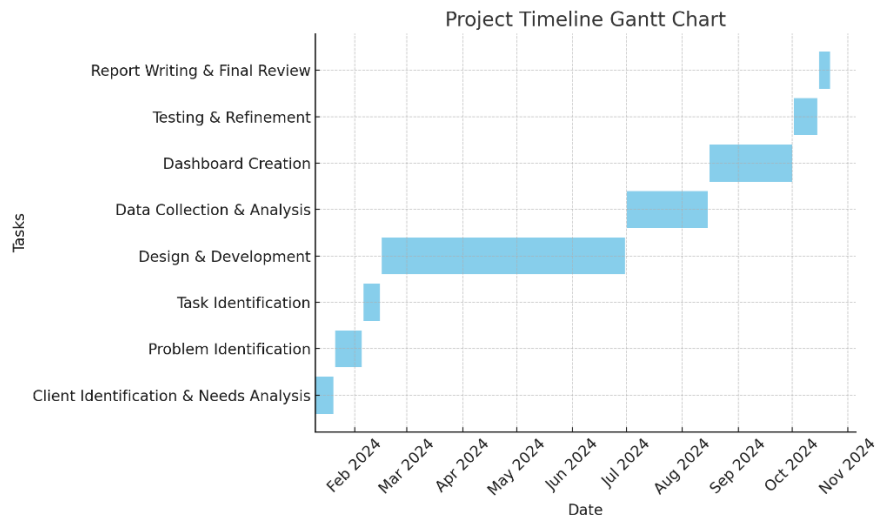
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## 1.4 Timeline

The project followed a structured timeline that included:

- **Phase 1 (2 weeks):** Data gathering, cleaning, and preprocessing.
- **Phase 2 (3 weeks):** Dashboard wireframe design and layout finalization.
- **Phase 3 (4 weeks):** Implementation of data visualization techniques and integration of interactive features such as filters for state, term, and loan purpose.
- **Phase 4 (1 week):** Final testing and deployment.





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## 1.5 Organization of the Report

The report is organized into the following sections:

- **Introduction:** Overview of the project, client need, and relevant issues.
- **Problem Statement:** Detailed description of the challenges faced by the institution.
- **Solution Design:** Explanation of the dashboard design, including data selection, visualization methods, and interpretation of key metrics.
- **Implementation:** Steps taken to build the dashboard and tools used.
- **Analysis:** Insights derived from the dashboard, including trends in loan applications, defaults, and funding.
- **Conclusion:** Summary of findings and recommendations for future use of the dashboard.

## **CHAPTER – 2**

### **LITERATURE REVIEW/BACKGROUND STUDY**

#### **2.1. Timeline of the Reported Problem**

The timeline for the reported problem of managing loan applications efficiently dates back to the inception of modern banking practices. Over the years, the increasing volume of loan applications has become a critical issue for banks. Historically, loan processing was done manually, which caused delays, errors, and operational inefficiencies. In the digital era, the introduction of loan management systems streamlined this process, but contemporary challenges, such as processing speed, fraud detection, and customer satisfaction, still persist. The need to integrate advanced technologies like AI and automation to handle loans has emerged in the 21st century, with specific emphasis on optimizing loan application evaluations and reducing default risks.

#### **2.2. Existing Solutions**

Several existing solutions have been developed over the years to tackle these challenges:

- **Automated Loan Management Systems:** These systems have been implemented to digitize loan applications, reducing paperwork and manual intervention.
- **Credit Scoring Models:** Predictive analytics and machine learning models are now widely used to evaluate an applicant's creditworthiness.
- **Fraud Detection Systems:** Advanced fraud detection algorithms analyze patterns in borrower data to minimize the chances of issuing bad loans.
- **Loan Origination Software:** These platforms assist banks in automating and tracking the entire loan process from application to disbursement.

Despite the progress in these solutions, they often lack integration with modern AI models, which could improve decision-making and customer interaction further.

#### **2.3. Bibliometric Analysis**

The bibliometric analysis of existing literature reveals that research on AI-driven loan processing systems has grown significantly in the past decade. A search across databases like Google Scholar, IEEE, and financial journals shows a steady increase in publications that discuss AI's impact on loan management, customer service, and fraud prevention. Publications from major financial institutions highlight the implementation of AI and machine learning models as a game-changer in the

financial sector. Key themes identified in the analysis include predictive loan scoring, real-time processing, and advanced customer service chatbots.

## **2.4. Review Summary**

The literature review demonstrates that while automation has improved efficiency in loan management, there is still a gap in fully optimizing the system for real-time processing and customer support. The incorporation of AI-driven models in predictive analytics and customer service (via chatbots) is a step forward. However, challenges remain in integrating these models with legacy systems, ensuring data security, and addressing regulatory concerns.

## **2.5. Problem Definition**

The key problem identified is the inefficiency in processing and managing a large volume of bank loan applications. Current systems often struggle with accurately assessing loan applicants, predicting defaults, and maintaining smooth customer communication. The solution requires a sophisticated AI-driven approach that can assess creditworthiness in real time, predict loan default risks more effectively, and improve the overall user experience with intelligent customer service features.

## **2.7. Goals/Objectives**

The primary goals and objectives of this project are:

- To develop an AI-integrated loan management system that can process loan applications more efficiently.
- To improve loan default prediction through advanced credit scoring models.
- To create a user-friendly interface with real-time communication capabilities (via chatbots) to enhance customer satisfaction.
- To integrate external API support for seamless data exchange and external loan verification services, like train booking systems, in the broader platform.

## **CHAPTER – 3**

### **DESIGN FLOW/PROCESS**

#### **3.1 Evaluation & Selection of Specifications/Features**

The dashboard project involved selecting key specifications to meet the client's needs. Key performance indicators (KPIs) such as total loan applications, funded amounts, interest rates, debt-to-income (DTI) ratio, and loan status were prioritized. Features like monthly breakdowns, loan purpose, and state-wise statistics were also crucial in providing actionable insights for the stakeholders. Excel's pivot tables were used for quick data summarization, and advanced formulas were applied for financial calculations and metrics like DTI, interest rates, and monthly installment breakdowns.

#### **3.2. Design Constraints**

Some constraints included maintaining an optimal level of dashboard simplicity while ensuring sufficient detail for effective decision-making. The dashboard also had to handle large volumes of data, which introduced limitations in terms of processing time and performance in Excel. Pivot tables were necessary for aggregating data but posed challenges with updating and recalculating across dynamic data sets. The balance between visual clarity and data density was carefully managed.

#### **3.3. Analysis of Features and Finalization Subject to Constraints**

After evaluating different visualization techniques and data presentation models, it was decided that graphical elements such as bar graphs, pie charts, and line charts would be used for better data representation. Pivot tables were implemented to quickly analyze trends in loan applications, good vs. bad loans, and loan purposes. The constraints led to the exclusion of overly complex filters and detailed segmentation, which could slow down dashboard performance.

#### **3.4. Design Flow**

The design flow followed a structured path:

- Data collection and cleaning.
- Data analysis through pivot tables for summarizing key metrics.

- Application of formulas for financial metrics like interest and installments.
- Chart creation to visualize insights derived from the pivot tables.

### 3.5. Design Selection

The final design was selected based on its user-friendliness, ease of navigation, and ability to provide actionable insights at a glance. Pivot tables and charts were combined to allow users to drill down into specific metrics without overwhelming them with too much information at once. Key filters like state, loan purpose, and loan status were added to make the dashboard more interactive.

### 3.6. Implementation Plan/Methodology

The implementation involved several steps:

- Data extraction and pre-processing.
- Setting up pivot tables for key metrics such as loan status and loan purposes.
- Formula application for financial computations.
- Visualization through Excel's charting tools. This methodology ensured that the dashboard was responsive to data updates and scalable for future enhancements.

### 3.7. Data Collection

ID	address_state	application_type	emp_length	emp_title	grade	home_ownership	Month	issue_date	last_credit_pull
1077430	GA	INDIVIDUAL	< 1 year	Ryder	C	RENT	Feb	11-02-2021	13-09-2
1072053	CA	INDIVIDUAL	9 years	MKC Accounting	E	RENT	Jan	01-01-2021	14-12-2
1069243	CA	INDIVIDUAL	4 years	Chemat Technology Inc	C	RENT	Jan	05-01-2021	12-12-2
1041756	TX	INDIVIDUAL	< 1 year	barnes distribution	B	MORTGAGE	Feb	25-02-2021	12-12-2
1068350	IL	INDIVIDUAL	10+ years	J&J Steel Inc	A	MORTGAGE	Jan	01-01-2021	14-12-2
1062608	CA	INDIVIDUAL	3 years	Studio 94 Corp	C	RENT	Jul	17-07-2021	16-03-2
1067441	TX	INDIVIDUAL	10+ years	American Airlines	C	MORTGAGE	Nov	19-11-2021	14-06-2
1066424	PA	INDIVIDUAL	10+ years	SCI Mahanoy	A	OWN	Jun	11-06-2021	14-07-2
1065254	FL	INDIVIDUAL	10+ years	Tech Data Corp	A	MORTGAGE	Sep	02-09-2021	15-06-2
1064589	MI	INDIVIDUAL	10+ years	teltow contracting	B	MORTGAGE	Feb	09-02-2021	16-03-2
1057766	TX	INDIVIDUAL	10+ years	Ericsson	B	MORTGAGE	Jul	22-07-2021	13-09-2
1062734	CA	INDIVIDUAL	3 years	myrvpartsplace.com	B	RENT	Sep	11-09-2021	13-03-2
1062654	CA	INDIVIDUAL	4 years	AEG LIVE	B	RENT	Aug	11-08-2021	13-10-2
1020855	CA	INDIVIDUAL	5 years	henkel corporation	B	RENT	Dec	11-12-2021	14-12-2
1060945	IL	INDIVIDUAL	4 years	AXA Assistance	B	RENT	Oct	11-10-2021	14-12-2
1060995	RI	INDIVIDUAL	< 1 year	HSA-UWC	B	RENT	Dec	11-12-2021	14-02-2
1046507	TX	INDIVIDUAL	1 year	Child's Day	B	RENT	Dec	02-12-2021	16-04-2
1059936	NY	INDIVIDUAL	4 years	OEC Freight	C	RENT	Oct	09-10-2021	15-09-2
1059497	FL	INDIVIDUAL	10+ years	Sandestin Beach Hilton	B	MORTGAGE	Dec	12-12-2021	14-12-2
1058060	MD	INDIVIDUAL	10+ years		D	OWN	Feb	02-02-2021	16-05-2
112245	WI	INDIVIDUAL	6 years	Chart Area  son Insurance	A	RENT	Jul	07-07-2021	16-04-2
207910	FL	INDIVIDUAL	< 1 year		A	MORTGAGE	Jan	08-01-2021	16-05-2
65426	MI	INDIVIDUAL	< 1 year	Infotrieve, Inc.	B	MORTGAGE	Aug	09-08-2021	16-05-2
211723	MD	INDIVIDUAL	4 years	self employed	C	OWN	Jan	08-01-2021	09-12-2
662350	NV	INDIVIDUAL	10+ years	Clark County School District	A	MORTGAGE	Jan	11-01-2021	13-02-2
1006769	PA	INDIVIDUAL	6 years	The Mount Sinai School of Medicine	A	MORTGAGE	Nov	11-11-2021	13-11-2
405898	GA	INDIVIDUAL	< 1 year	Blue Ridge Design Group	A	MORTGAGE	Jun	09-06-2021	16-05-2
445846	MI	INDIVIDUAL	10+ years	Abbott Nutrition	A	MORTGAGE	Oct	09-10-2021	16-05-2
659221	MI	INDIVIDUAL	3 years	rice &werthmann	A	MORTGAGE	Jan	11-01-2021	16-05-2
782425	UT	INDIVIDUAL	6 years	Five County Assoc of Governments	A	MORTGAGE	Jun	11-06-2021	16-05-2
458328	GA	INDIVIDUAL	< 1 year	north ga dentention center	B	MORTGAGE	Jan	10-01-2021	10-11-2
744344	WA	INDIVIDUAL	6 years		B	MORTGAGE	May	11-05-2021	16-05-2
1066462	CA	INDIVIDUAL	6 years		C	MORTGAGE	Nov	11-11-2021	14-04-2

Bank loan\_23MCA20341 - Excel

Shubhangi\_Srivastava 23MCA20341

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	K	L	M	N	O	P	Q	R	S	T	U	V	W
	last_payment_date	loan_status	Good Loan vs Bad Loan	next_payment_date	member_id	purpose	sub_grade	term	verification_status	annual_income	dti	installment	int_rate
1													
2	13-04-2021	Charged Off	Bad Loan	13-05-2021	1314167	car	C4	60 months	Source Verified	30000	0.01	59.83	0.15
3	15-01-2021	Fully Paid	Good Loan	15-02-2021	1288686	car	E1	36 months	Source Verified	48000	0.0535	109.43	0.18
4	09-01-2021	Charged Off	Bad Loan	09-02-2021	1304116	car	C5	36 months	Not Verified	50000	0.2088	421.65	0.19
5	12-03-2021	Fully Paid	Good Loan	12-04-2021	1272024	car	B2	60 months	Source Verified	42000	0.054	97.06	0.10
6	15-01-2021	Fully Paid	Good Loan	15-02-2021	1302971	car	A1	36 months	Verified	83000	0.0231	106.53	0.06
7	12-08-2021	Fully Paid	Good Loan	12-09-2021	1294481	car	C3	36 months	Not Verified	28000	0.126	275.96	0.14
8	13-12-2021	Fully Paid	Good Loan	13-01-2022	1301833	car	C2	36 months	Verified	94800	0.2453	205.86	0.14
9	14-07-2021	Fully Paid	Good Loan	14-08-2021	1291243	car	A4	36 months	Source Verified	59000	0.0665	172.1	0.0
10	12-10-2021	Charged Off	Bad Loan	12-11-2021	1299335	car	A5	36 months	Verified	116400	0.0394	762.08	0.08
11	16-03-2021	Fully Paid	Good Loan	16-04-2021	1298401	car	B5	60 months	Not Verified	36000	0.1773	93.21	0.12
12	13-08-2021	Fully Paid	Good Loan	13-09-2021	1289131	car	B5	36 months	Not Verified	75000	0.088	181.15	0.12
13	12-10-2021	Charged Off	Bad Loan	12-11-2021	1295018	car	B4	36 months	Not Verified	75000	0.2288	374.26	0.12
14	13-09-2021	Fully Paid	Good Loan	13-10-2021	1294929	car	B3	36 months	Not Verified	35000	0.0401	165.38	0.11
15	14-12-2021	Fully Paid	Good Loan	14-01-2022	1249642	car	B5	36 months	Not Verified	48000	0.1533	268.36	0.12
16	14-12-2021	Fully Paid	Good Loan	14-01-2022	1293124	car	B4	36 months	Not Verified	92000	0.106	200.5	0.12
17	13-10-2021	Charged Off	Bad Loan	13-11-2021	1292578	car	B4	36 months	Source Verified	60000	0.063	400.99	0.12
18	14-12-2021	Fully Paid	Good Loan	14-01-2022	1277552	car	B1	36 months	Verified	16800	0.035	98.29	0.09
19	12-11-2021	Fully Paid	Good Loan	12-12-2021	1291775	car	C2	36 months	Source Verified	40000	0.1869	343.09	0.14
20	14-12-2021	Fully Paid	Good Loan	14-01-2022	1291322	car	B2	36 months	Verified	35000	0.1392	162.87	0.10
21	15-02-2021	Fully Paid	Good Loan	15-03-2021	1289636	car	D1	36 months	Not Verified	40000	0.0957	176.51	0.16
22	10-08-2021	Fully Paid	Good Loan	10-09-2021	112227	car	A2	36 months	Not Verified	40000	0.0255	155.38	0.07
23	10-02-2021	Charged Off	Bad Loan	10-03-2021	183496	car	A2	36 months	Not Verified	120000	0.0767	69.14	0.07
24	11-06-2021	Charged Off	Bad Loan	11-07-2021	232106	car	B1	36 months	Not Verified	60000	0.1108	131.22	0.11
25	08-08-2021	Charged Off	Bad Loan	08-09-2021	211606	car	C2	36 months	Not Verified	72000	0.0512	262.26	0.11
26	12-08-2021	Charged Off	Bad Loan	12-09-2021	847024	car	A5	36 months	Not Verified	70800	0.0795	77.95	0.07
27	13-06-2021	Charged Off	Bad Loan	13-07-2021	1233120	car	A3	36 months	Not Verified	80000	0.0648	124.45	0.07
28	09-12-2021	Charged Off	Bad Loan	09-01-2022	454145	car	A5	36 months	Not Verified	36000	0.15	385.14	0.09
29	12-02-2021	Charged Off	Bad Loan	12-03-2021	544784	car	A5	36 months	Not Verified	45000	0.152	222.41	0.08
30	13-10-2021	Charged Off	Bad Loan	13-11-2021	843127	car	A5	36 months	Not Verified	86400	0.0385	280.62	0.07
31	12-07-2021	Charged Off	Bad Loan	12-08-2021	985412	car	A5	36 months	Not Verified	24600	0.0785	152.42	0.08
32	10-07-2021	Charged Off	Bad Loan	10-08-2021	570309	car	B2	36 months	Not Verified	30000	0.0992	164.85	0.11
33	13-01-2021	Charged Off	Bad Loan	13-02-2021	942813	car	B4	36 months	Not Verified	48000	0.2357	197.83	0.11
34													

Pivot Summary Dashboard Overview Dashboard Data

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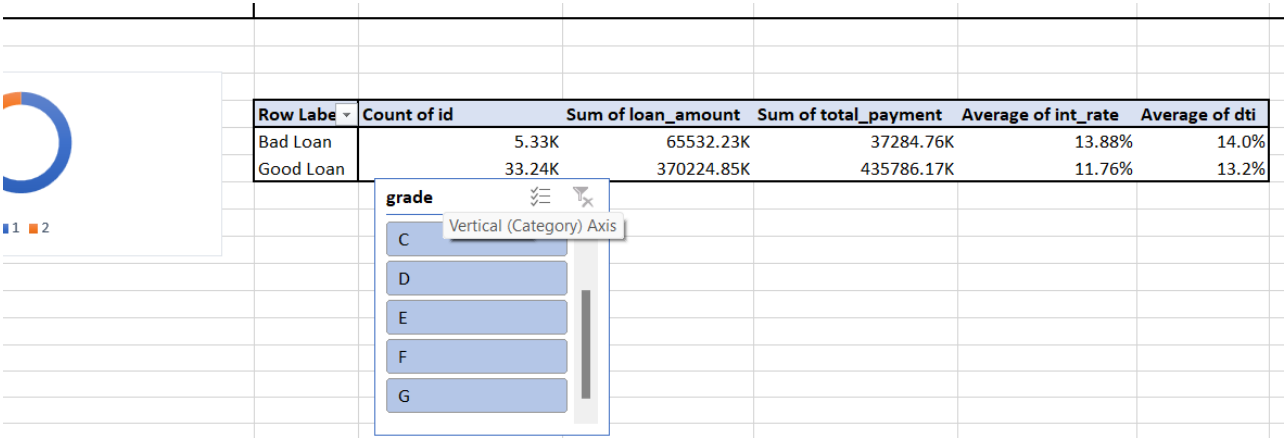
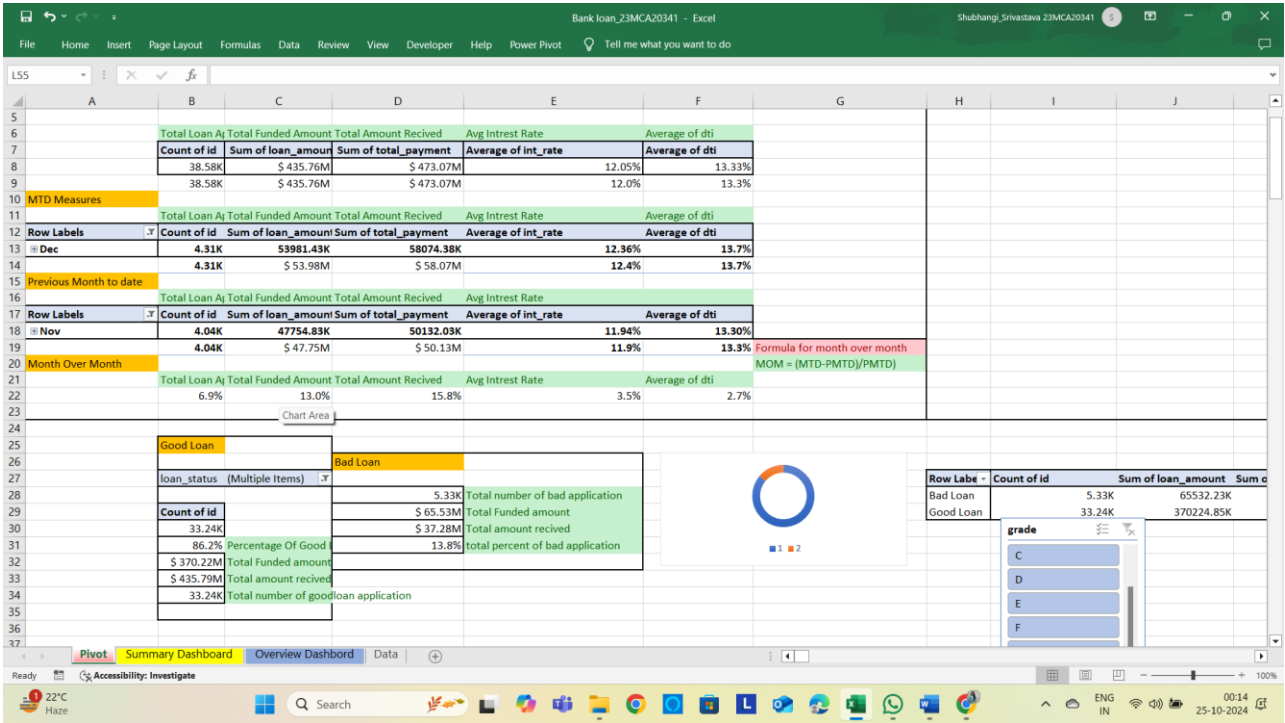
### 3.8. Data Processing

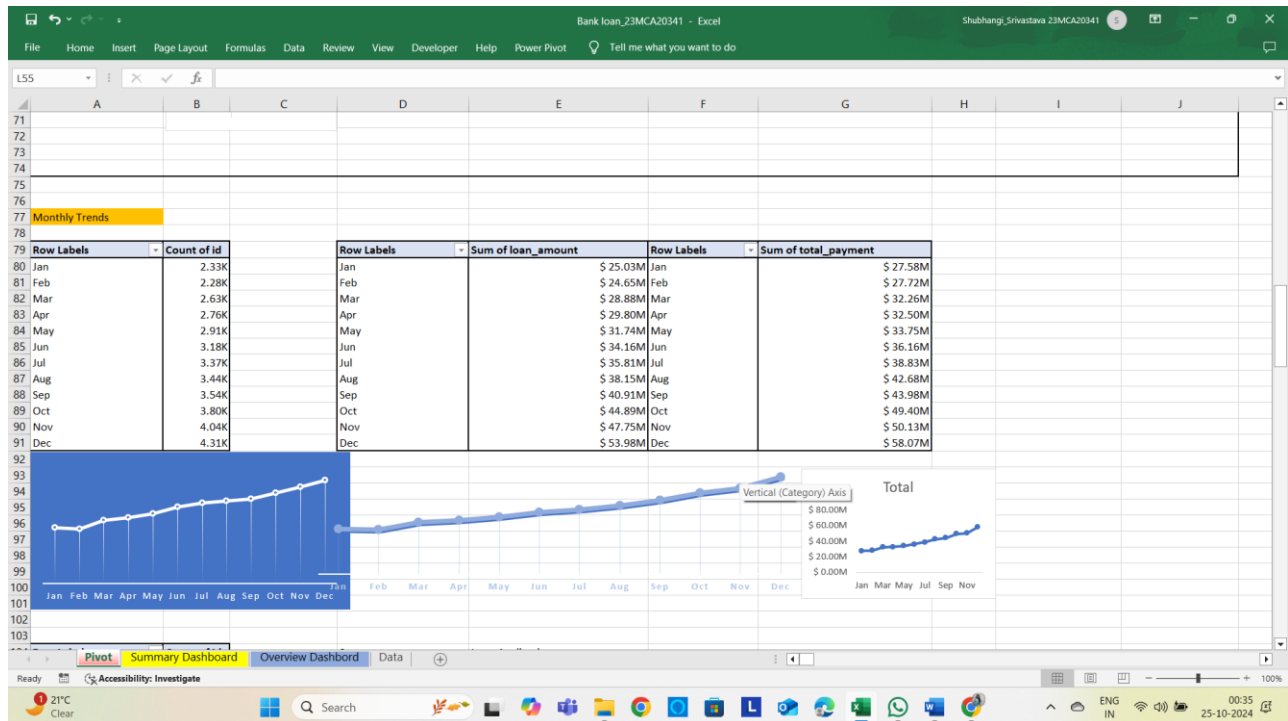
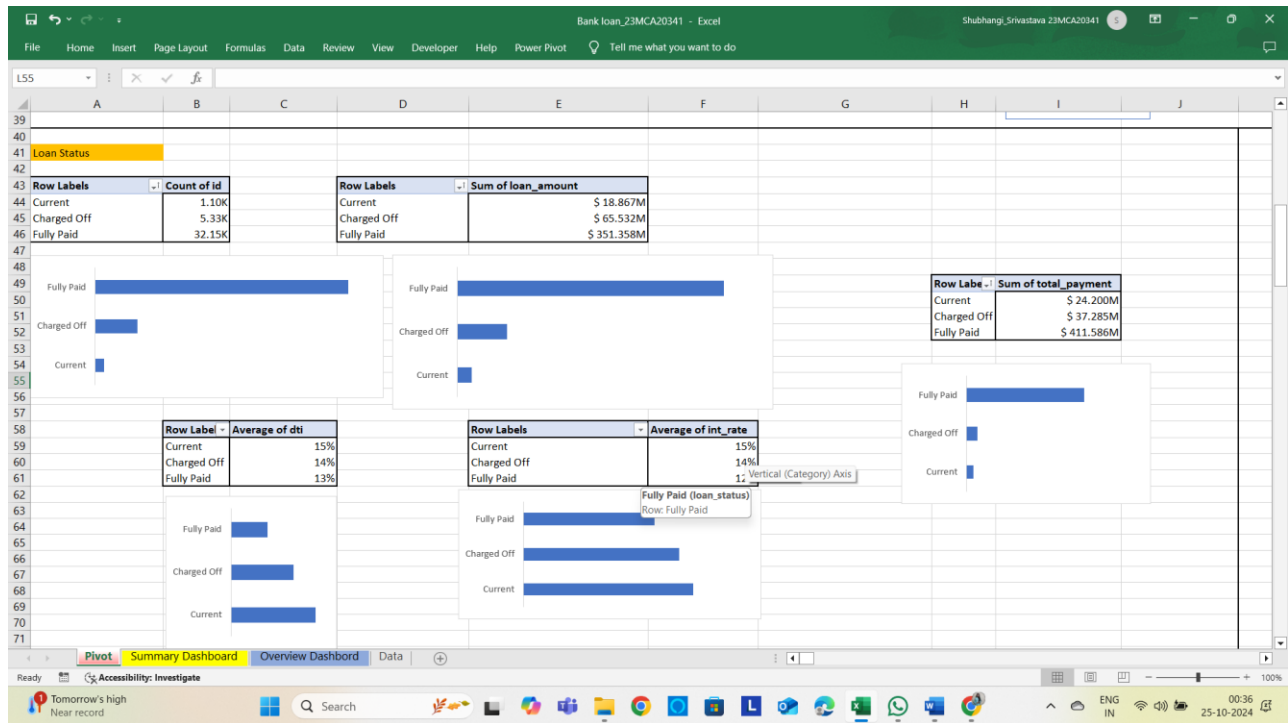
**Data Processing** involves cleaning, transforming, and organizing raw data into a structured format suitable for analysis.

#### Key Steps in Data Processing:

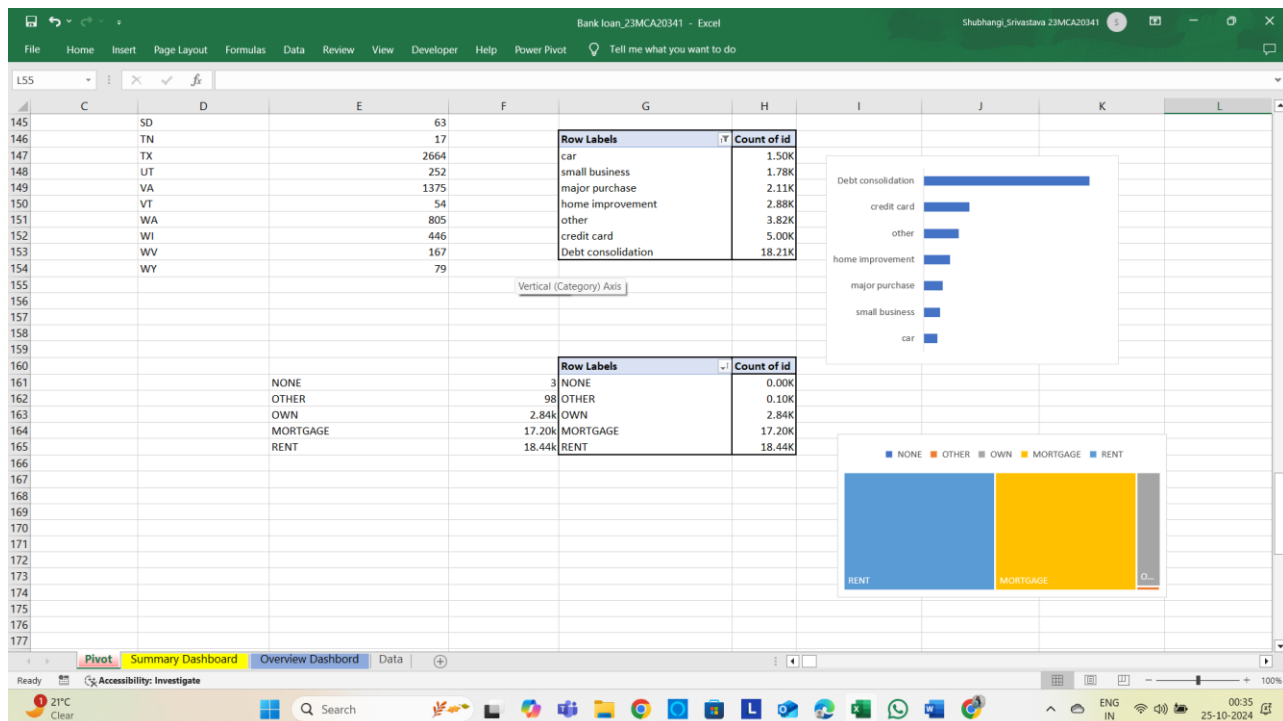
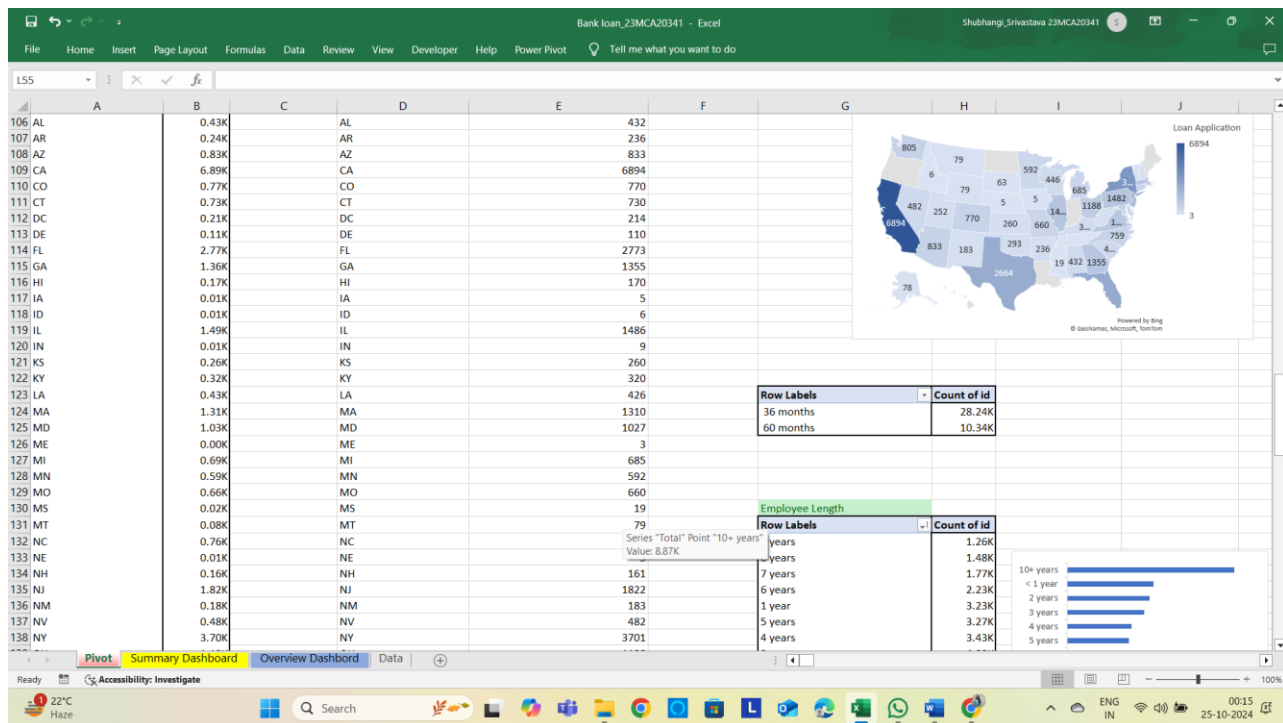
- 1. Data Cleaning:**
  - Remove duplicates, handle missing values, and correct inconsistencies.
- 2. Data Transformation:**
  - Convert data types, apply scaling or normalization, and create new calculated fields (e.g., total loan payments, interest accrued).
- 3. Data Integration:**
  - Merge data from multiple sources (e.g., customer info, loan data, credit scores).
- 4. Data Aggregation:**
  - Use pivot tables to summarize data (e.g., total loans by region, average loan amount per customer type).

Pivot tables and visualisation processing:









## **CHAPTER – 4**

### **RESULTS ANALYSIS AND VALIDATION**

#### **4.1. Implementation of solution**

##### **1. Data Import and Preparation:**

- Import the bank loan data into Excel or a database.
- Clean and preprocess the data using formulas to handle missing values, convert formats, and apply transformations (e.g., calculating the DTI ratio or total loan payments).

##### **2. Pivot Tables Setup:**

- Use pivot tables to summarize key metrics such as loan statuses, approval rates, default rates, and loan purposes.
- Aggregate data for different KPIs, including loan amounts, interest rates, and total payments.

##### **3. Dashboard Creation:**

- Create the visual dashboard using Excel charts, graphs, and slicers:
  - **Bar/Column Charts** for loan statuses and approval rates.
  - **Pie Charts** for loan purpose distribution.
  - **Line Charts** for loan repayment trends over time.
- Set up interactivity using filters and slicers to allow users to drill down into specific data points like loan grade or region.

##### **4. Formulas & Calculations:**

- Apply Excel formulas to calculate KPIs such as average loan amounts, default rates, and DTI ratios. Use **IF**, **SUM**, **AVERAGE**, and **VLOOKUP** functions where necessary.

##### **5. Testing & Validation:**

- Validate the accuracy of the pivot tables and calculated KPIs by cross-checking with raw data.
- Ensure that visualizations update dynamically as new data is added.

##### **6. Deployment:**

- Share the dashboard with stakeholders by uploading it to a shared drive or integrating it into a business intelligence tool like Power BI for further enhancements.

- Ensure the dashboard is user-friendly, allowing non-technical users to interact with it easily.

### **Key Performance Indicators (KPIs) for the Dashboard:**

1. **Total Loan Applications:** The total number of loans applied for, indicating customer interest and engagement.
2. **Loan Approval Rate:** Percentage of loans approved out of the total applications, reflecting approval efficiency.
3. **Average Loan Amount:** The average size of the loans approved, providing insights into loan distribution.
4. **Default Rate:** Percentage of loans that defaulted, indicating financial risk and loan performance.
5. **Debt-to-Income (DTI) Ratio:** A critical metric that shows the applicant's ability to repay, calculated as a percentage of their debt obligations to their income.
6. **Interest Rate Distribution:** Average interest rates for loans, categorized by type or grade, reflecting financial product attractiveness.
7. **Loan Status Breakdown:** Distribution of loans by status (e.g., fully paid, late, charged-off).

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### **Data Analysis:**

#### **1. Loan Default Analysis:**

- Use pivot tables to compare default rates by loan grade, loan purpose, or borrower income levels.
- Identify patterns in high-risk loan categories.

#### **2. Income vs. Loan Amount Correlation:**

- Analyze how borrower income correlates with loan amounts and interest rates, using scatter plots and summary statistics.

#### **3. Loan Purpose Analysis:**

- Break down loan applications by purpose (e.g., home improvement, debt consolidation) to understand the most common uses.

#### **4. Payment Trends:**

- Track repayment history and trends over time using line charts, identifying periods with higher or lower repayment success.

## **CHAPTER – 5**

### **CONCLUSION AND FUTURE WORK**

#### **5.1. Conclusion**

The **Bank Loan Dashboard** project successfully addressed the need for a comprehensive, data-driven tool to monitor loan performance and financial risk. By implementing pivot tables, advanced Excel formulas, and interactive visualizations, the dashboard provided stakeholders with clear insights into loan applications, default rates, and borrower metrics. The use of KPIs like the loan approval rate, default rate, and debt-to-income ratio allowed for better decision-making and improved oversight of the bank's loan portfolio. Additionally, the interactivity of the dashboard made it user-friendly and adaptable to future data updates.

Key outcomes include:

- A clear understanding of loan trends and borrower risk profiles.
- Improved ability to track loan repayments, defaults, and financial performance.
- Efficient use of data summarization tools like pivot tables to derive meaningful insights.

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#### **5.2. Future Work:**

While the dashboard is a powerful tool for analyzing bank loans, several enhancements can be made to improve its functionality and scalability in the future:

##### **1. Integration with Real-Time Data:**

- Connect the dashboard to live databases or APIs to update loan and borrower data in real time, providing up-to-date insights.

##### **2. Advanced Analytics:**

- Implement machine learning models for predictive analysis, such as forecasting loan defaults or identifying high-risk borrowers.

##### **3. Enhanced Visualizations:**

- Incorporate advanced visualizations using platforms like Power BI or Tableau for more dynamic, aesthetically appealing insights.

#### **4. Automated Reporting:**

- Enable automated generation of monthly or quarterly reports based on dashboard data, reducing manual efforts.

#### **5. Scalability:**

- Explore migrating the dashboard to a more scalable platform like a cloud-based BI tool to handle larger datasets and multiple user access.

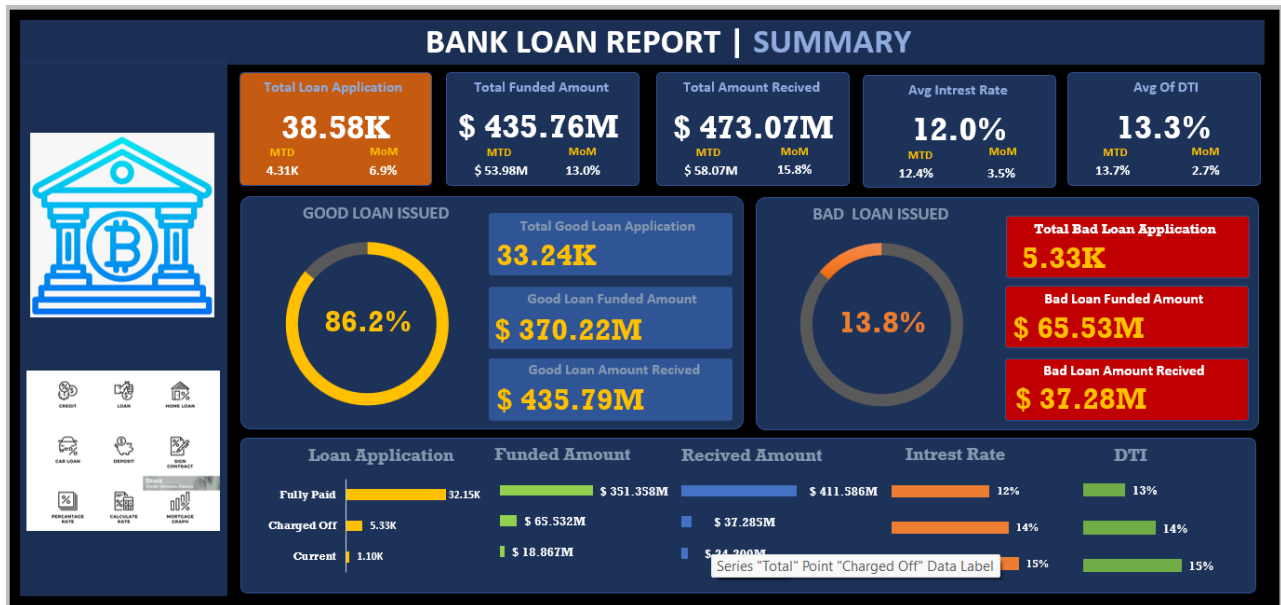
## **REFERENCES**

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- YouTube – Channel: Data Tutorials

# USER MANUAL

## Dashboards:

- Summary Dashboard:



- Overview Dashboard:

