

CSE 564 – VISUALIZATION

FINAL PROJECT – PROPOSAL

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Project Proposal

Visually charting and analysing State-wise, Bank Group-wise, Bank-wise, and Population Group-wise Number of Functioning Offices of Commercial Banks in India recorded at the end of each quarter for the last 15 years by creating a visual dashboard using D3.js and Flask

Introduction and Background

Commercial banks play a vital role in the Indian economy, and the number of functioning offices of these banks across different states, bank groups, and population groups provide critical insights into the banking industry's performance. This project aims to analyse the dataset titled "State-wise, Bank Group-wise, Bank-wise, and Population Group-wise Number of Functioning Offices of Commercial Banks in India as at end of the Quarter" from 2006 to 2022 to identify patterns, insights and trends into the progress and expansion of the commercial banking industry. The project will use visual analytics techniques to present the findings in an easily understandable and insightful manner.

Data Source: <https://dbie.rbi.org.in/DBIE/dbie.rbi?site=publications#!17>

The dataset was sourced from the Database on Indian Economy (DBIE) – RBI's Data Warehouse, a sub group maintained by the official RBI (Reserve Bank of India). The Reserve Bank of India is responsible for minting, distribution and maintaining the currency of India - INR (Indian Rupee). DBIE releases and updates the data at the end of every quarter and the latest dataset is up to date till the quarter ending in December 2022.

The analysis of the State-wise, Bank Group-wise, Bank-wise, and Population Group-wise Number of Functioning Offices of Commercial Banks in India from 2006 to 2022 is crucial for several reasons.

Firstly, commercial banks are a vital component of any economy, especially developing nations, and their performance is closely linked to the overall health of the economy. Therefore, analysing the trends and patterns in the commercial banking industry will provide insights into the Indian economy's overall health which is said to be a developing nation with one of the highest increase over the past few decades.

Secondly, the commercial banking industry in India has undergone significant changes over the past few years, with the emergence of new players and the adoption of technology-driven banking

models. Analysing the dataset will provide information on the growth and penetration of new players and the extent to which technology has been adopted by commercial banks in India.

Thirdly, the dataset contains information on the number of functioning offices of commercial banks across different states, bank groups, and population groups. This information is critical for understanding the distribution of banking services across the country and identifying areas where there is a lack of access to banking services. This information can be used to improve financial inclusion efforts and ensure that all citizens have access to banking services.

Furthermore, the lack of access to banking services can lead to a host of other problems, including limited access to credit and financial products, which can have far-reaching implications for individuals and the economy as a whole. By identifying areas where there is a lack of access to banking services, the government and other stakeholders can take steps to improve financial inclusion efforts and address these issues.

Access to banking services is critical for poverty reduction and economic growth because it enables individuals and businesses to save, borrow, invest, and manage their financial resources more effectively. In context of India, a country that has the second largest population on earth. The top 3 commercial sectors based on the workforce it employs in India is - Agriculture, Retail and Manufacturing. Here are some of the potential ways bank offices help the workforce in these sectors:

Agriculture (approx. 50% workforce): Access to banking services can help farmers obtain credit to purchase seeds, fertilizers, and other inputs needed for crop production. It can also help them obtain loans for investing in new equipment or expanding their farming operations. By analysing the number of functioning offices of banks in rural areas, policymakers can identify areas where there is a lack of access to credit and take steps to improve financial inclusion efforts. This can help farmers improve their economic opportunities, increase their agricultural productivity, and lift themselves out of poverty.

Retail (approx. 8% workforce): Access to banking services can help retailers obtain credit to purchase inventory, expand their business, and invest in new technologies. By analysing the number of functioning offices of banks in urban areas, policymakers can identify areas where there is a lack of access to credit and take steps to improve financial inclusion efforts. This can help retailers improve their economic opportunities, grow their businesses, and create new jobs.

Manufacturing (approx. 7% workforce): Access to banking services can help manufacturers obtain credit to purchase new equipment, invest in research and development, and expand their operations. By analysing the number of functioning offices of banks in industrial areas, policymakers can identify areas where there is a lack of access to credit and take steps to improve financial inclusion efforts. This can help manufacturers improve their economic opportunities, increase their competitiveness, and contribute to the growth of the manufacturing sector.

There are many of the ways in which access to banking services can help reduce poverty and promote economic growth. Here are some:

Access to credit: Banks provide loans and credit to individuals and businesses, which can help them start or expand their businesses, invest in education or training, or purchase assets such as land or equipment. Access to credit can help individuals and businesses improve their economic opportunities and lift themselves out of poverty. Many steps such as Account opening, KYC verification, document submission and attestation along with proper service to the customers in Tier 2 and Tier 3 cities across the country (which form the majority of the nations population) can only happen with functioning offices such as Bank Branch offices, Administration Offices, etc.

Savings and investment: Banks provide a safe and secure place for individuals to save their money, which can help them build assets and accumulate wealth over time. Banks also provide investment opportunities, such as mutual funds or stocks, which can help individuals grow their wealth and achieve financial goals.

Payment services: Banks provide payment services, such as checking accounts, debit cards, and mobile payment systems, which can help individuals and businesses manage their day-to-day transactions more efficiently. Access to payment services can reduce transaction costs and increase the speed and security of financial transactions.

Financial education and advice: Banks provide financial education and advice to their customers, which can help individuals and businesses make more informed financial decisions. Financial education and advice can help individuals and businesses manage their finances more effectively and avoid financial pitfalls that can lead to poverty.

Problem Statement

To analyse the dataset taken from the official RBI website and identify trends, patterns, and insights into the top 5 banks of the commercial banking (private and public both) industry's performance from 2006 to 2022.

To present the findings in a visually appealing and insightful manner using visual analytics techniques in a cogent dashboard using D3 framework in JavaScript with a Python Flask backend.

Approach Methodology

The project will use the dataset "State-wise, Bank Group-wise, Bank-wise, and Population Group-wise Number of Functioning Offices of Commercial Banks in India as at end of the Quarter" from 2006 to 2022. The dataset contains information on the number of functioning offices of commercial banks across different states, bank groups, and population groups. The project will use visual

analytics techniques such as graphs, charts, and maps to present the findings in an easily understandable and insightful manner.

Steps:

The project will follow the following steps:

Data cleaning and filtering: The dataset will be filtered to contain data of the top 5 of the provided 20+ banks namely State Bank of India(public), HDFC Bank(private), ICICI Bank(private), Bank of Baroda(public) and Axis Bank(private), after which it will be cleaned to remove missing data and outliers. The filtering is done to emphasize on the overall trend over the time period instead of focusing on a lot of microfinance banks which have a negligible effect on the trends and graph. Instead including the whole data would increase the complexity of the charts shown causing trends to not be seen as clearly.

Data exploration: The dataset will be explored to identify trends, patterns, and insights into the commercial banking industry's performance from 2006 to 2022.

Visual analytics: The findings will be presented using visual analytics techniques such as graphs, charts, and maps to provide insights into the commercial banking industry's performance.

Technology Stack:

Python (Flask framework for backend), JavaScript (D3 framework for visual analytics), HTML, CSS.

Expected Results

My project expects to achieve the following results:

Identification of trends, patterns, and insights into the workings, progress and performance of commercial banking industry from 2006 to 2022.

Presentation of findings in a visually appealing and insightful manner using visual analytics techniques on a dashboard. Using interactive techniques and connecting the graphs to one another, it is expected to find interesting results and insights that may give us a better understanding of the functioning and progress of the Indian Economy which is said to be currently performing better than USA in the current market.

Conclusion

In conclusion, the analysis of the State-wise, Bank-wise, Population Group-wise and Bank Group-wise Number of Functioning Offices of Commercial Banks in India from 2006 to 2022 is critical for understanding the overall health of the Indian economy, identifying trends in the commercial banking industry, and ensuring that all citizens have access to banking services. Access to banking services can help reduce poverty and promote economic growth by providing access to credit, savings and investment opportunities, payment services, and financial education and advice. By increasing access to banking services by the means of functioning offices like Bank Branches, Administrative Offices and outlets, individuals and businesses can improve their economic opportunities, accumulate wealth, and contribute to the progress and development over the decades of the Indian economy.