



Project Report:

Assessment of Debit and Credit Card Usage in the Indian Banking Industry: A Comprehensive Dashboard for HDFC Bank

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Abstract

The banking industry in India is characterized by its dynamism and constant evolution, marked by remarkable growth and transformation. Amidst this vibrant diversity, HDFC Bank, as one of the top banks in the country, seeks to maintain its leadership position by making informed decisions and embracing data-driven strategies. In light of the challenges faced in the highly competitive market, the bank has recognized the need for a comprehensive card usage dashboard. This dashboard aims to monitor critical performance indicators and assess HDFC Bank's standing relative to the broader banking landscape, thereby enabling the leadership to benchmark its performance, analyze customer behavior, and drive customer satisfaction. The project encompasses a journey from web scraping with Selenium to data preparation in Excel and ultimately, creating an interactive and insightful dashboard with Tableau. The subsequent report provides a comprehensive analysis of the dashboard, unveiling key insights and actionable recommendations that will empower HDFC Bank to chart a path towards continued success and excellence in India's banking sector.

Introduction

In the pulsating realm of India's banking industry, HDFC Bank stands as a formidable force, redefining banking experiences and spearheading innovation. As the nation's financial landscape continually evolves, the strategic pursuit of excellence and adaptability remains paramount for the bank to maintain its position among the industry's elite.

To stay ahead of the competition and unlock the full potential of growth opportunities, HDFC Bank's leadership recognized the pressing need for a solution that would transcend conventional wisdom. Their vision materialized in the form of a comprehensive card usage dashboard that would serve as the compass navigating them through the complexities of market dynamics.

This MicroExperience embarks on an enthralling journey as we dive into the intriguing realm of data science, where each step serves as a building block to construct an insightful dashboard. Leveraging Python's prowess, we embark on a web scraping adventure, gathering the essential data from the Reserve Bank of India's (RBI) repository. Armed with this data, our journey navigates the treacherous terrains of data preparation, where we meticulously cleanse, transform, and shape the raw data into a format conducive to data visualization and analysis.

Tableau, a powerful data visualization tool, came to the fore as the platform to create an interactive and dynamic dashboard. Leveraging Tableau's capabilities, the dashboard offers an immersive user experience, allowing stakeholders to explore critical metrics and trends with ease. The inclusion of filters for card type, bank, and month makes the dashboard versatile, accommodating the management's specific requirements.

Throughout this report, we present a detailed account of the project's various stages, from data collection to dashboard development. Furthermore, we analyze the findings and insights gleaned from the dashboard, presenting a comprehensive assessment of HDFC Bank's performance in the debit and credit card segment. In addition, we propose actionable

recommendations based on these insights, providing a roadmap for further growth and success.

Data Collection and Preparation

Data Collection :

To initiate the project, we collected the required data from the Reserve Bank of India (RBI) website using web scraping techniques with Selenium. Selenium is a powerful automation tool that allows us to interact with web pages and extract data programmatically. The RBI website provides valuable data on various banking and financial metrics, including debit and credit card usage for different banks.

The web scraping process involved the following steps:

1. Accessing the RBI website's specific page for debit and credit card usage data (<https://www.rbi.org.in/Scripts/ATMView.aspx>).
2. Automating the web browser using Selenium to navigate to the desired page and extract the data.
3. Using Python programming language, the web scraping script collected data for each month from April 2022 to March 2023.
4. The data was extracted in tabular format and saved in Excel files for further analysis.

Data Preparation :

Upon obtaining the data through web scraping, the next crucial step was data preparation in Excel. The raw data required thorough cleaning and transformation to make it suitable for analysis and visualization.

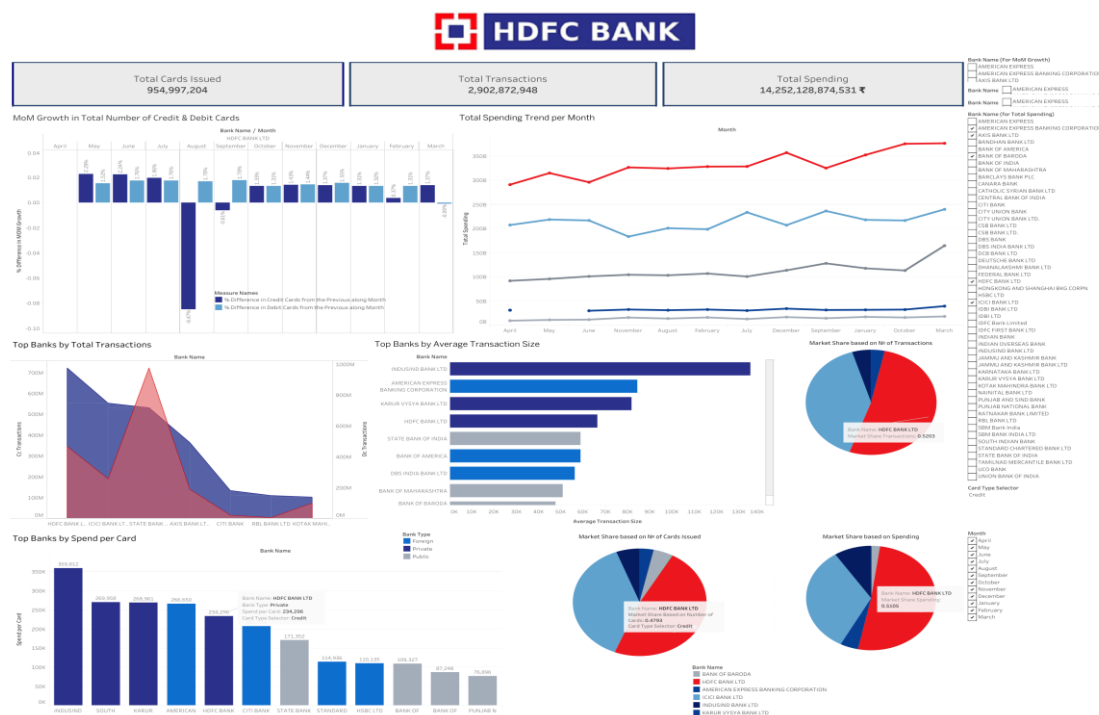
Data preparation steps included:

- Stripping Irrelevant Data: The leadership was interested only in credit and debit card data. Hence, all other data unrelated to these card types, such as data for prepaid cards, was removed from the dataset.
- Unmerging Cells: The raw data contained merged cells, which made it difficult to use the data for analysis and visualization. Merging cells were unmerged to ensure data integrity and accuracy.
- Aggregating Transaction Values: For each bank, we aggregated the transaction values across different transaction modes (PoS, Online, and Others) to obtain the total spending in ₹ (Indian Rupees) for each month. We excluded the "Cash Withdrawal" data from the analysis as it was not relevant to the bank's card usage performance.
- Categorizing Banks: The raw data presented bank names grouped by bank type (Public, Private, and Foreign). We categorized the banks accordingly, removing entries for "Payment" and "Small Finance" banks.
- Deleting Empty Rows and Columns: To ensure a clean and structured dataset, we removed any empty rows or columns that did not contain meaningful information.

Dashboard Overview

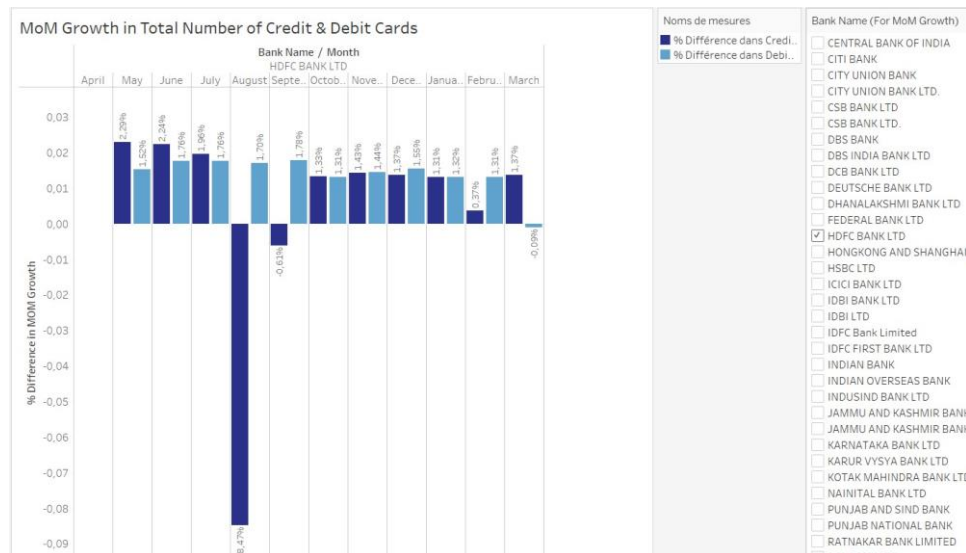
This section provides an in-depth look at the Tableau dashboard created to monitor and assess debit and credit card usage at HDFC Bank within the broader banking landscape. This section highlights the key visualizations, interactive features, and filters incorporated into the dashboard to cater to the bank's leadership requirements.

The Tableau dashboard serves as a powerful tool that enables real-time tracking and analysis of key performance indicators (KPIs) and market share metrics. With a focus on providing actionable insights, the dashboard empowers HDFC Bank's management with data-driven decision-making capabilities to remain competitive in the rapidly evolving banking industry.

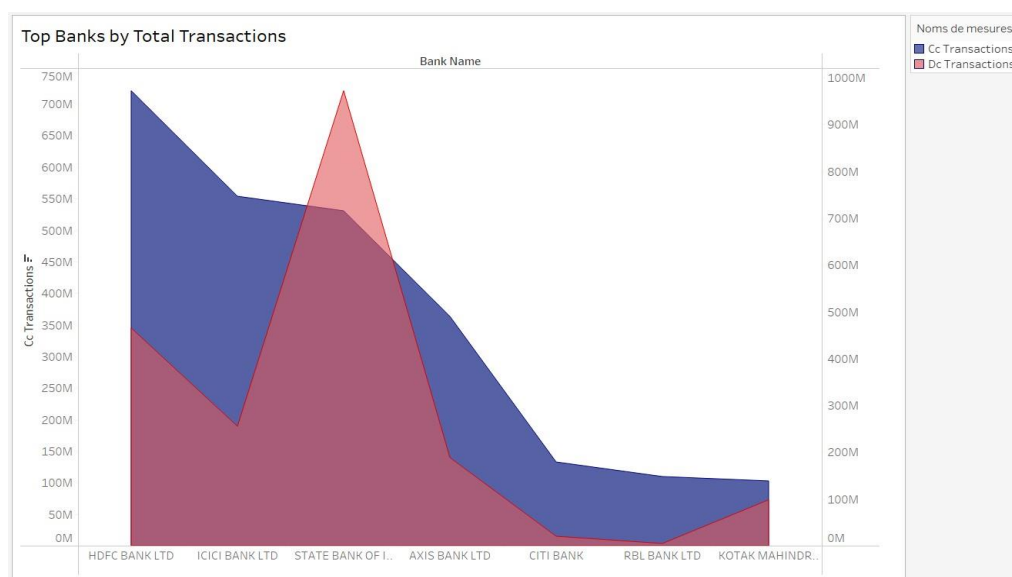


Key Visualizations:

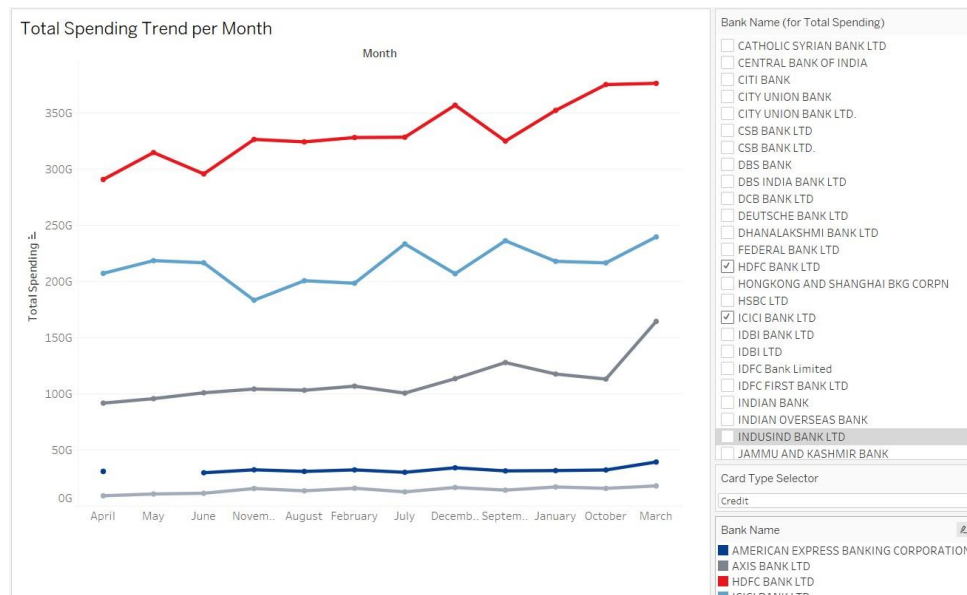
- MoM Growth in Total Number of Credit & Debit Cards:** This line chart tracks the month-over-month growth in the total number of credit and debit cards issued by HDFC Bank. The dashboard allows users to filter the data by bank name, enabling a comparative analysis with other banks. The visualization aids in understanding the bank's growth trajectory and market penetration in the highly competitive debit and credit card segment.



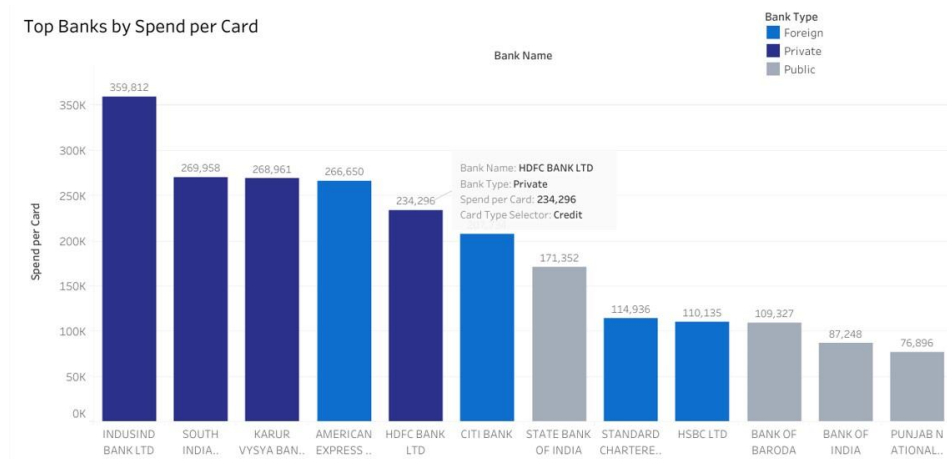
- Top Banks by Total Transactions:** Represented as a bar chart, this visualization highlights the top banks (including HDFC Bank) based on the total number of transactions for both credit and debit cards. The chart provides a clear picture of the bank's transaction volume and its ranking among competitors, assisting in identifying market leaders and potential areas for improvement.



- Total Spending Trend per Month:** The line chart illustrates the trend in total spending per month for HDFC Bank, facilitating an assessment of spending patterns over time. Users can apply filters for bank name and card type to gain valuable insights into spending behavior across different segments.

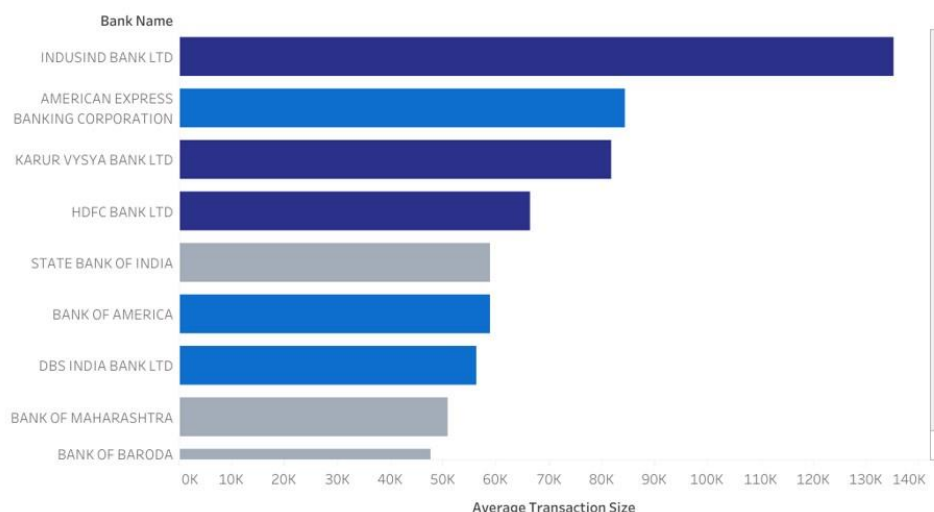


- **Top Banks by Spend per Card:** Presented as a bar chart with bank types (Public, Private, and Foreign) distinguished by colors, this visualization showcases the top banks (including HDFC Bank) based on the average spending per card (spend per card). This metric is crucial for understanding customer spending habits and evaluating the bank's card offerings.

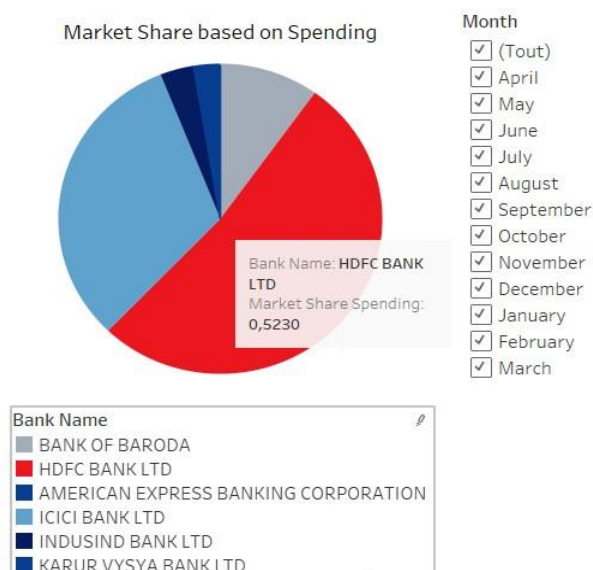


- **Top Banks by Average Transaction Size:** Displayed as a bar chart, this visualization identifies the top banks (including HDFC Bank) based on the average transaction size for both credit and debit cards. Users can apply filters for the month and card type to pinpoint trends or potential areas for enhancing transaction sizes.

Top Banks by Average Transaction Size



- Market Share - Number of Cards Issued, Transactions, Spending:** The dashboard includes three pie charts, each representing the market share of HDFC Bank and its competitors based on the number of cards issued, total transactions, and spending. These charts provide a holistic view of the bank's standing within the industry and its share of the market across critical performance metrics.



Analysis and Insights

The analysis of the dashboard's visualizations offers valuable insights into HDFC Bank's debit and credit card usage performance within the Indian banking industry. The key findings are as follows:

1. Total Transactions:

- HDFC Bank stands out as the top bank in terms of total credit card transactions. However, for debit card transactions, it ranks second, with the State Bank of India (SBI) holding the first position.

- The bank's dominance in credit card transactions demonstrates its strong market presence and customer engagement in the credit card segment.

2. Total Spending Trend per Month:

- HDFC Bank exhibits a high spending trend per month compared to other banks, indicating the bank's popularity and customer spending habits.
- The consistent growth in total spending per month reflects the bank's effective marketing strategies and customer-centric approach.

3. Spend per Card:

- In terms of spend per card, HDFC Bank holds a prominent position, ranking among the top 5 banks for credit cards and top 4 banks for debit cards.
- Notably, HDFC Bank secures the top spot among private banks in debit cards transactions, showcasing its effectiveness in capturing high-value spending customers.

4. Average Transaction Size:

- HDFC Bank ranks 4th in average transaction size, signifying a balanced mix of small and large transactions by its cardholders.
- The bank's strong performance in this metric indicates effective customer segmentation and targeted marketing strategies.

5. Market Share:

- The pie charts representing market share based on the number of cards issued, total transactions, and spending illustrate HDFC Bank's significant market share in the debit and credit card segment.
- The bank's substantial percentage of market share demonstrates its leadership position and market dominance compared to its competitors.

Insights and Implications :

1. Strengthening Debit Card Transactions:

While HDFC Bank excels in total credit card transactions, the bank could explore strategies to enhance its market share in debit card transactions. Analyzing the success factors of competitors like SBI, identifying customer preferences, and offering targeted incentives could help drive debit card usage.

2. Leveraging High Spending Trend:

HDFC Bank's high spending trend per month reflects its popularity among customers. The bank can capitalize on this trend by introducing personalized offers, exclusive partnerships, and premium rewards to further enhance customer loyalty.

3. Focusing on Spend per Card:

HDFC Bank's competitive position in spend per card for both credit and debit cards indicates a strong customer base and high-value clientele. The bank can continue its focus on offering premium services and tailored products to retain and attract affluent customers.

4. Enhancing Average Transaction Size:

Improving average transaction size can lead to increased revenue and profitability. HDFC Bank could consider targeted marketing campaigns, cross-selling opportunities, and incentivizing larger transactions to bolster this metric.

5. Sustaining Market Leadership:

HDFC Bank's dominant market share across various metrics reaffirms its position as a market leader. To maintain this status, the bank should continue leveraging data-driven insights, monitoring customer trends, and adapting strategies to cater to evolving customer needs.

Conclusion

The analysis and insights derived from the dashboard showcase HDFC Bank's strong performance in the debit and credit card segment, positioning it as a frontrunner in the Indian banking industry. By capitalizing on its strengths, addressing opportunities for improvement, and leveraging data-driven decision-making, HDFC Bank can sustain its position as a leading financial institution and enhance customer satisfaction and loyalty in the dynamic and competitive market.