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BankBlack USA Minority Owned Bank Dashboard

The COWRIE Initiative in partnership with Poverty Solutions

University of Michigan
School of Information, SI 485
Information Analysis Capstone

Students: Dominique Roitman, Ian Mulhern, Kallen Cohane, Kristofer Siimar
Client: BankBlack USA, PovertySolutions

Introduction

Problem Statement

One of the main problems with today's financial industry is the lack of information availability. Specifically, people do not have access to information about the usage of their money and the impact their chosen institutions have on their communities.

The issue affects the Minority Depository Institutions (MDIs) and Community Development Financial Institutions (CDFIs) the most. Due to the lack of awareness, lack of knowledge, and negative biases, these banks are often underutilized. The inequities that still exist for black, brown, and lower-income white communities regarding financial services are systemic structural factors that have led communities to financial exclusion and intergenerational poverty. For the MDIs and CDFIs to be able to drive more change, the financial and demographic data about these institutions has to be made publicly available and easily accessible.

Primary Goal

The primary goal for the project is to bridge the information gaps between users and the benefits of the MDIs and CDFIs and educate and convince users that those black-owned financial institutions can equally and better serve their money. By giving the users of BankBlackUSA the means to find discernable information about the location and success of these banks, the long-term benefit would include increasing the volume of customers that use MDIs and CDFIs. Our interactive dashboards with various search filters will enable users to get a better overview of the resources they provide to individual communities, and as a result, persuade potential customers. Therefore, the main impact of our product will be evident in the way that MDIs and CDFIs are now more accurately represented in the financial industry and in the way they support the communities they serve.

The final deliverable will consist of interactive dashboards developed on Tableau that can be easily integrated into the BankBlackUSA site through link embedding. The dashboards enable users to gather necessary information about MDIs, based on their community reinvestment efforts compared to larger financial institutions— namely loan distribution, in order to choose the most appropriate financial institutions.

Technical Requirements

The tools required are specific to the types of data that we will be working with and the intended output. Our work will consist of leveraging Tableau to create an informative and digestible dashboard.

The data we used was extracted through the FFIEC website. The information consists of Community Report Act data. The FFIEC website makes these reports difficult to parse, as each bank's report is in its own PDF with all of the information in separate tables. Below, we go into detail about the tools used to store, manipulate, and leverage the data.

Compile Data

Google Sheets

We initially used Google Sheets to create a new dataset for the client. We created one workbook with 11 different sheets of data, based on the different tables of information found in each bank's CRA report. Each of the sheets consist of rows of different bank names and locations, and columns relating to the specifics of each table. The tables all have to do with bank loans for things like home mortgages and small businesses based on individuals incomes and revenues. We used Google Sheets initially because we were all able to work separately in a shared space to insert the data from PDF files in an already cleaned way. In order to create a live connection and further analyze the data we decided to put this data into an SQL server.

Microsoft SQL Server Azure

Through storing the data in a microsoft SQL Server environment hosted on Azure, basic sql querying skills are required to format the specific data into views that can be connected to from our tableau client. In continuing to grow the dataset and add more tables one of our team members leveraged database design, normalization and advanced JOIN functions to ensure that data was being stored in the most valuable manner. This method of data storage was chosen because it has the ability to be a live source of data that is accessible to as many stakeholders as possible and SQL query language has the greatest impact in terms of answering specific questions about the data.

Visualize

Tableau

Tableau is the graphical user interface that is ultimately allowing us to present the collected data in a way that is more interactive and easily digestible. We chose this tool because Poverty Solutions, a partner on the project, is a University of Michigan affiliated organization — therefore enabling us to use Tableau through their license.

Approach/Design

Bridge information separation of banks and users

- CRA data is accessible to the public through the FFIEC website, but the portal is outdated and requires extensive preliminary knowledge of the CRA's contents to parse through and access the actual reports
- The reports are in PDF form, which is largely unacceptable for larger-scale analysis and interpretation. By bringing this information into a set of visualizations, we bring actionable insights directly to our consumers.

Educate users

- By making the reports more digestible and accessible, users will be able to learn more detailed information about each bank and their lending habits.
- This information is highly valuable to both the consumers and government and business-related interest groups looking to understand the status of Black-Owned Financial Institutions at a high level.

Find and choose financial services that best serve users' values and interests.

- Using location, bank, and loan filters, users will be able to make educated decisions on where to bank when looking at the information displayed in the various visualizations.

Major Components

Database Design

At the heart of our project lies the compiled data that connects to Tableau. After determining what data would be brought in from the FFIEC site, we had to determine how the data would be normalized to create a financial data database. The two main tasks consisted of gathering the data and determining the structure of the database.

Gathering Data

We gathered data on Black-Owned MDIs from the Federal Financial Institutions Examination Council's (FFIEC) Community Reinvestment Act (CRA) reports. Each bank's report is a separate PDF document consisting of different tables of data regarding loan and bank information. These reports are released approximately every 4-6 years for each bank. This data was manually extracted and put into CSV files by each of us. Manually extracting the data took more time, but it gave us a clear understanding of the data we were working with which helped in the long run.

Determining Structure

From CSVs, the data was normalized and imported into Microsoft's Cloud offering, Azure. The data was brought specifically into a Microsoft SQL Server database which serves as a live repository for present and future data that can be accessed and visualized. This Database is currently managed by Ian Mulhern who is the sole administrator. As Ian Mulhern is going to continue with BankBlackUSA, he will be able to continue his role as the Database administrator and ultimately bring the database under the umbrella of BankBlack itself.

Visualization Design

The front-end deliverable for our project is the four dashboards -- that enable users to find and analyze MDIs' and Big Banks' performance data. The visualizations were created on Tableau and are now published on the UMich Public Server hosted through Poverty Solutions and are publicly accessible with the links below. The two main components leveraged on the dashboards are visualizations and filters. There are a total of four dashboards that contain all of the visualizations. The first displays loan information for different Black-Owned MDIs across a variety of locations. Dashboards 2 and 3 contain this same information but are broken up by Small Business Loans and Home Mortgage Loans to allow for the information to be more visually digestible. The last dashboard has two main visualizations. The left chart compares loan distribution figures, specifically in low income communities, between 'Big US Banks'. The list of Big US Banks includes: Citi Bank, Wells Fargo, TD Bank, PNC, U.S. Bancorp, and Truist Financial Corporation. The right chart compares home mortgage loan distribution figures, specifically for low income individuals between MDIs. It was important to focus on the visualizations and how they translate to users since they are the key informative component of our project. The second component within the visualization design was the implementation of filters to allow users to cater their experience to the banks and locations they are interested in.

Semester Workflow Pipeline

Project Workflow process visualized here:
https://drive.google.com/file/d/1wulTrDi48Fi3h1XyTeQiFSjASb76gMBo/view?usp=sharing

Results

Final Deliverable

We have completed the excellent viable product for the project. We have built a comprehensive database consisting of MDIs' and big financial institutions' CRA report data. Additionally, we have created two interactive dashboards with diverse filtering options, which allow users to find and compare MDIs and compare MDIs to big financial institutions on lending performance towards low-income communities. At the moment, the dashboards are hosted on Poverty Solutions webpage; however, we are working with BankBlackUSA's web developers to integrate the dashboards into BankBlack's website.

The live links to the 4 dashboards are:

- MDI Overview:
  https://tableau.dsc.umich.edu/#/site/UM-Public/views/BankingBlack/MDI-OverallStats?:iid=1

- MDI - Small Business Lending: https://tableau.dsc.umich.edu/#/site/UM-Public/views/BankingBlack/MDI-SmallBusLoans?:iid=1
- MDI - Home Mortgage Lending: https://tableau.dsc.umich.edu/#/site/UM-Public/views/BankingBlack/MDI-HomeMortLoans?:iid=1
- Big Banks and MDI Comparison: https://tableau.dsc.umich.edu/#/site/UM-Public/views/BankingBlack/BB-MDIComparison?:iid=1