

A Project Report on

“Financial Consumer Complaints Data Analysis Using Tableau Dashboard”

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SUBMITTED BY

SAHIL SAIFI (23MCI10142)

NARESH CHAUHAN DASU (23MCI10007)

SUBMITTED TO

AST. PROFESSOR ROHINI

E14603

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Chapter 1: Objective

The objective of the Financial Consumer Complaints Data Analysis Project is to systematically analyze and uncover the root causes of consumer dissatisfaction in the financial sector. The analysis will empower organizations to make data-driven modifications that address these concerns, ultimately improving public services and enhancing customer satisfaction. This project focuses on utilizing intelligent computing through an interactive Tableau dashboard to provide dynamic, real-time insights into customer complaints. By doing so, it supports continuous monitoring and proactive decision-making.

Key objectives include:

- I. Identifying Root Causes of Consumer Dissatisfaction:** The primary objective is to delve deep into consumer complaint data to uncover the underlying issues that lead to dissatisfaction. This analysis will categorize complaints based on various factors such as service delays, billing errors, product misunderstandings, or poor customer service experiences. The goal is to go beyond surface-level data and identify trends, patterns, and recurring themes in the complaints. This understanding will help organizations focus their efforts on the areas that cause the most frustration among consumers and make targeted improvements.
- II. Utilizing Real-Time Data for Decision-Making:** A critical objective is to ensure that the data analysis is real-time and dynamic. As the complaint data updates regularly, the Tableau dashboard will automatically reflect these updates, enabling stakeholders to have the most current view of customer grievances. This real-time capability will allow organizations to respond quickly to emerging issues, mitigating negative impacts and improving customer experiences proactively.
- III. Enhancing Public Services through Intelligent Computing:** Another key objective is to leverage intelligent computing to support deeper analysis of the complaint data. This includes using natural language processing (NLP) and machine learning to analyze unstructured text data from complaints, extract sentiments, and classify complaints into actionable categories. By automating this process, the system can detect emerging issues, even if they are not immediately obvious, and provide insights that would be difficult to obtain manually. This will lead to a more accurate and nuanced understanding of consumer pain points.
- IV. Improving Organizational Responsiveness and Service Quality:** Through this analysis, the objective is to create a feedback loop for continuous service improvement. By identifying the key drivers of dissatisfaction, organizations can modify their processes, products, or customer service strategies to address these issues more effectively. The

ultimate goal is to reduce the number of consumer complaints over time by addressing their root causes, leading to higher customer satisfaction and loyalty.

- V. Supporting Evidence-Based Policy and Decision-Making:** Finally, the project aims to equip decision-makers with the tools and insights needed for evidence-based decision-making. The Tableau dashboard will present complex data in an accessible and interactive manner, allowing leaders to explore the data from different angles, track performance metrics, and make informed decisions that align with customer needs and organizational goals.

Chapter 2: Introduction

The Financial Consumer Complaints Dashboard is an interactive, business-ready tool designed to track and analyze complaints across various categories in the financial sector. It enables organizations to make data-driven decisions by evaluating key performance indicators (KPIs) related to customer complaints. This dashboard provides a comprehensive overview of consumer dissatisfaction, helping to identify trends, root causes, and areas for improvement. This dashboard is dynamic, allowing users to select a custom date range from the top right corner. As the date range is adjusted, the visual elements, including charts, maps, and metrics, update automatically, enabling real-time analysis and insights. This feature makes the dashboard a powerful tool for monitoring trends over time and observing how changes in service or policy impact consumer feedback.

Key Features of the Dashboard:

- I. Total Complaints Overview:** The dashboard tracks over 75,000 complaints, providing a high-level view of overall consumer dissatisfaction. The metrics displayed include the total number of complaints, the percentage of timely responses, and the current complaints in progress, giving a snapshot of organizational responsiveness.
- II. Complaints by Issue:** This bar chart breaks down complaints by specific issues, such as managing an account, deposits, billing disputes, and identity theft. This allows users to identify the most common problems reported by consumers, helping organizations prioritize their efforts to resolve these concerns.
- III. Complaints by State:** A hex map of the U.S. visualizes the distribution of complaints across different states. States with a higher volume of complaints, like California and Florida, are easily identifiable, allowing organizations to focus region-specific efforts on improving service quality and addressing localized issues.

- IV. Complaints by Media:** The dashboard captures how complaints were submitted, whether via web, phone, referral, or other media. This helps organizations understand consumer preferences for submitting complaints and adjust their customer service strategies accordingly.
- V. Complaints by Product:** This section of the dashboard categorizes complaints by financial product, such as credit cards, mortgages, and student loans. This breakdown is critical for understanding which products are causing the most consumer dissatisfaction and require the most attention from the organization.
- VI. Customer Dispute Percentage:** A pie chart shows the percentage of complaints that were disputed by customers, giving insight into how many cases required further attention or did not satisfy consumers initially.

This dashboard provides a holistic view of customer complaints, making it an invaluable tool for decision-makers in the financial industry. By enabling real-time data exploration and tracking of KPIs, it helps organizations identify problem areas, monitor performance over time, and make strategic adjustments to improve customer satisfaction. The ability to drill down by issue, product, media, and geography ensures that organizations can tailor their solutions to specific challenges and enhance their service delivery.

Chapter 3: Literature Review

The analysis of consumer complaints, particularly in the financial sector, is an increasingly critical area of research. The use of interactive dashboards, such as those built with tools like Tableau, provides a dynamic and effective way to visualize and interpret vast amounts of data related to consumer dissatisfaction. This section explores relevant literature on the use of data analysis, complaint management, and interactive dashboards, drawing insights from previous research to contextualize the importance and effectiveness of the developed Financial Consumer Complaints Dashboard.

I. Consumer Complaints in Financial Services:

Consumer complaints serve as a critical barometer for the quality of services provided by financial institutions. According to a study by **Stauss and Seidel (2019)**, effective complaint management is directly linked to improved customer satisfaction, loyalty, and retention. Their research highlights the importance of identifying common causes of dissatisfaction and promptly addressing them to prevent customer attrition. The Consumer Financial Protection Bureau (CFPB) has also emphasized the role of complaint data in regulatory oversight and policy development, suggesting that complaint analysis can inform both customer service improvements and compliance efforts (CFPB, 2017).

The dashboard developed for this project aligns with these studies by providing financial institutions with a tool to monitor and categorize complaints, helping them to proactively manage customer dissatisfaction and comply with regulatory requirements.

II. The Role of KPIs in Complaint Management:

Key Performance Indicators (KPIs) are widely regarded as essential metrics for evaluating the performance of complaint management systems. Research by **Kumar and Reinartz (2018)** outlines the significance of KPIs such as resolution time, dispute rates, and timely responses in evaluating the effectiveness of customer service strategies. They argue that tracking these metrics in real-time enables organizations to respond quickly to emerging issues, thus improving their service levels.

The **Financial Consumer Complaints Dashboard** integrates these KPIs, such as complaint resolution rates and the percentage of disputes, enabling stakeholders to make informed, data-driven decisions that can enhance service delivery.

III. Dynamic Dashboards for Real-Time Decision-Making:

Dynamic dashboards are increasingly recognized for their ability to improve decision-making by providing real-time access to key metrics. **Few (2012)** argues that interactive dashboards represent an evolution in data presentation, making data more accessible to a wider audience and enabling quicker, more informed decisions. Dashboards can also provide a visual summary of complex datasets, helping users identify trends and patterns that would be difficult to spot in traditional reports.

In the context of complaint analysis, the ability to dynamically filter data by date range, product category, and issue type is essential. The developed dashboard offers real-time updates, allowing decision-makers to track complaint trends and respond to customer grievances promptly, a feature supported by previous research advocating for dynamic visualizations in business intelligence applications (**Harmon, 2016**).

IV. Data Visualization and User Experience:

Effective data visualization is crucial in presenting complaint data in a way that is both meaningful and easy to interpret. **Tufte (2006)**, in his seminal work on data visualization, argues that well-designed visual representations can turn complex datasets into actionable insights. Modern tools such as **Tableau** have incorporated Tufte's principles by offering customizable, interactive features that allow users to engage with the data more intuitively. In the financial complaint's dashboard, the use of bar charts, hex maps, and pie charts provides a clear, visual representation of complaint data across different dimensions. The interactive nature of the dashboard allows users to drill down into specific complaints by product, state, or issue, thereby enhancing user experience and making the data more actionable.

V. Big Data and Machine Learning in Complaint Analysis:

The advent of big data and machine learning has introduced new possibilities for analyzing consumer complaints. **Nguyen et al. (2020)** highlight how machine learning techniques such as natural language processing (NLP) can be used to analyze unstructured complaint data, extracting valuable insights from text-based complaints. These approaches are particularly useful in identifying trends or emerging issues that might not be immediately apparent from traditional data analysis methods.

While the current dashboard focuses on structured complaint data (e.g., complaint categories, submission media, and product types), future iterations could incorporate NLP techniques to analyze the unstructured text of complaints, further improving the insights derived from the data.

VI. Inspiration and Design Considerations:

The design of the Financial Consumer Complaints Dashboard draws inspiration from **Gandes Goldestan**, known for creating user-friendly, visually appealing dashboards that prioritize clarity and usability. Goldestan's approach emphasizes the importance of designing dashboards that allow for quick data exploration while minimizing cognitive load on the user (**Goldestan, 2019**). By adhering to these principles, this dashboard aims to provide a seamless user experience, making it easy for users to uncover trends and actionable insights without requiring advanced technical skills.

Chapter 4: Methodology

The Financial Consumer Complaints Dashboard was developed using a combination of data processing and visualization tools to ensure efficient analysis of consumer complaint data. The methodology focuses on the collection, transformation, and analysis of complaint data, followed by the design and deployment of an interactive dashboard in Tableau. Each step of the process is detailed below, along with the tools and techniques used.

I. Data Collection:

- **Source of Data:** The dataset for this project consists of financial consumer complaints. The data obtained from publicly available sources like “data.world”, “Kaggle.com” etc.

Financial Consumer Complaints

 Connection
☒ Live ☐ Extract

 Filters
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Migrated Data 25 fields 75513 rows					
100 rows					
Table Details	#		Abc	Abc	Abc
	Financial Consumer Complaints...	Financial Consumer Complaints...	Financial Consumer Complaints.c...	Financial Consumer Complaints.csv	Financial Consumer Complaints.csv
	Complaint ID	Date Sumbited	Product	Sub-product	Issue
	2824926	24-02-2018	Credit card or prepaid card	General-purpose credit card ...	Closing your account
	1515991	12-08-2015	Debt collection	Credit card	Improper contact or sharing ...
	1145261	05-12-2014	Bank account or service	Checking account	Deposits and withdrawals
	2573763	13-07-2017	Mortgage	Conventional home mortgage	Trouble during payment proc...
	2573113	13-07-2017	Mortgage	Conventional home mortgage	Struggling to pay mortgage
	2406037	27-03-2017	Credit card	""	Billing disputes
	2395777	20-03-2017	Debt collection	Mortgage	Cont'd attempts collect debt ...
	2850771	19-03-2018	Checking or savings account	Checking account	Managing an account
	2376685	07-03-2017	Mortgage	Other mortgage	Settlement process and costs
	2825857	26-02-2018	Credit card or prepaid card	Store credit card	Closing your account
	96200	06-06-2012	Credit card	""	Billing disputes
	2569972	10-07-2017	Checking or savings account	Checking account	Managing an account

II. Data Analysis:

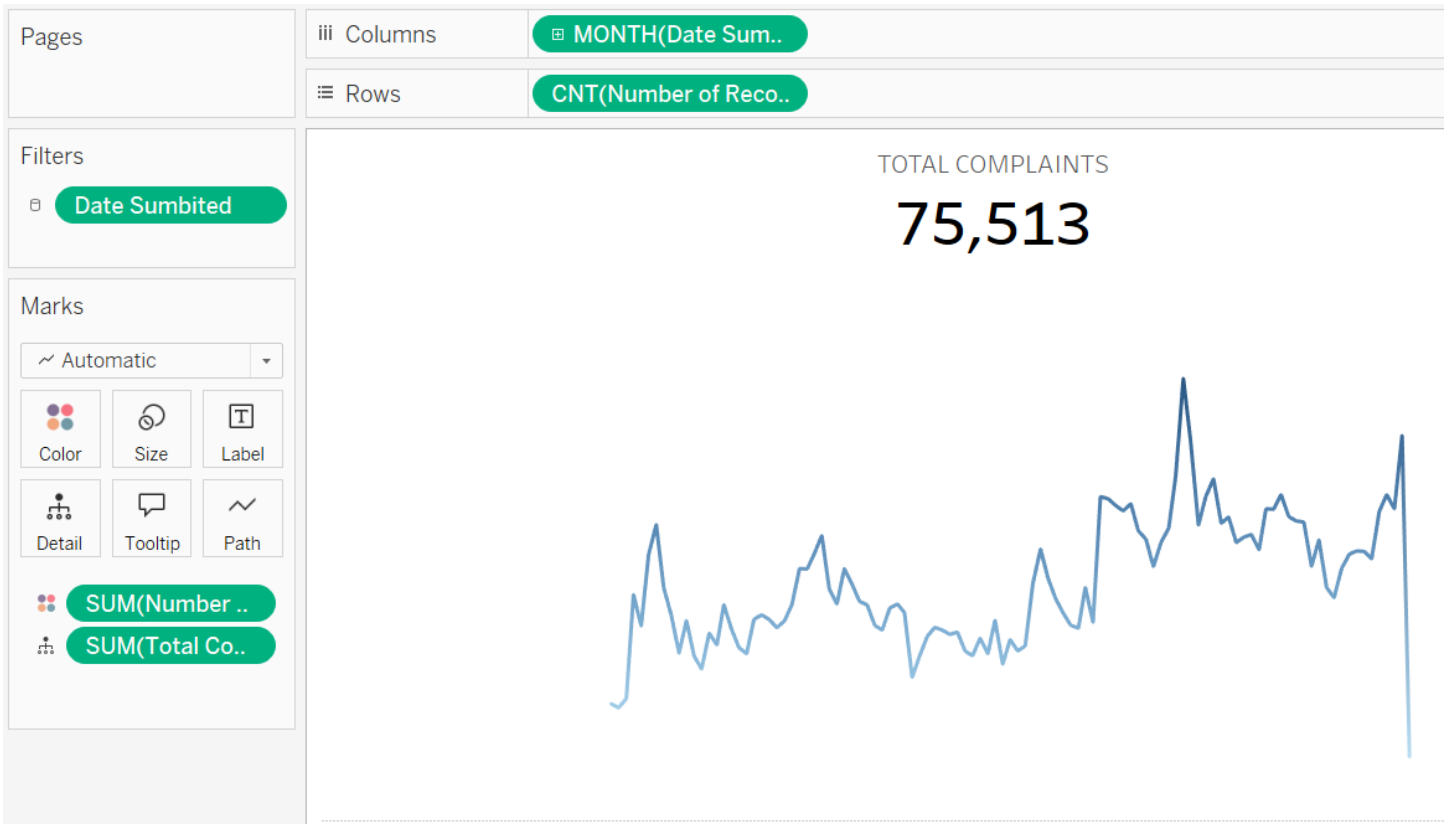
- **KPIs (Key Performance Indicators)** were calculated to track critical metrics such as total complaints, response time, dispute rate, and issue resolution status.
 - **Tools Used:**
 - **Tableau:** The main tool for data analysis and visualization, Tableau was used to create calculated fields, aggregated views, and interactive elements that showcase insights from the data.

III. Dashboard Development:

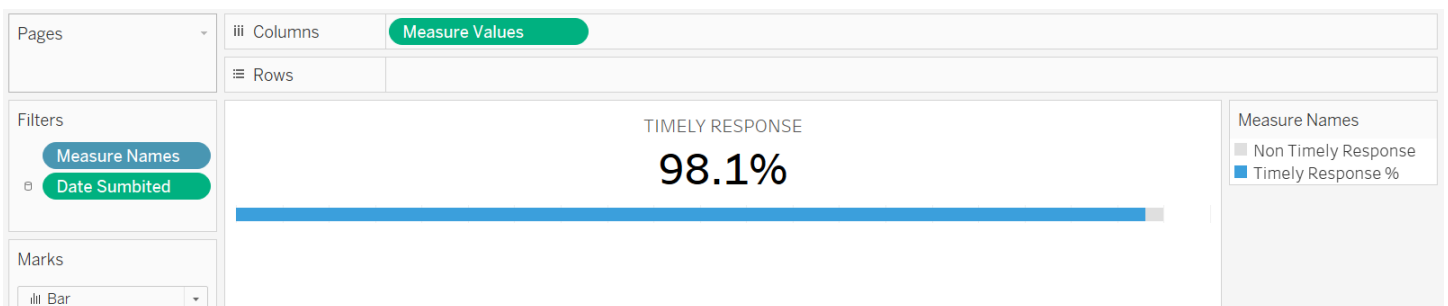
The dashboard was built to display a wide variety of metrics related to consumer complaints, providing an interactive and user-friendly way for decision-makers to engage with the data.

Dashboard Content:

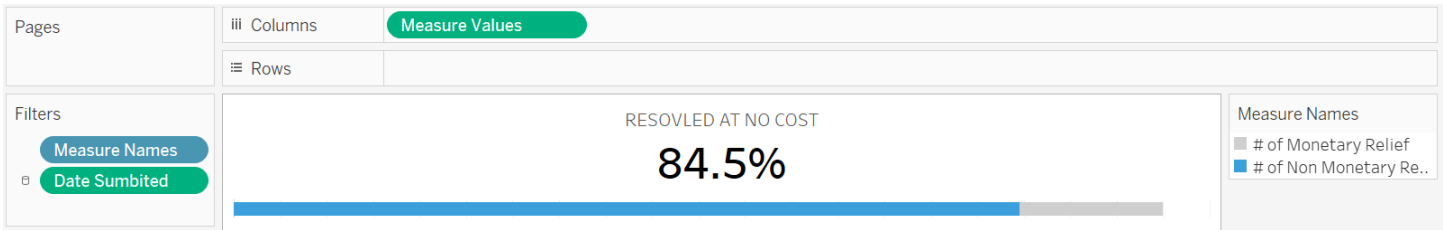
- **Total Complaints Filed:** This metric shows the overall number of complaints filed by consumers within the selected date range. It provides an overarching view of customer dissatisfaction levels.
 - **Tableau** was used to create this aggregated view by counting the number of unique complaint records.



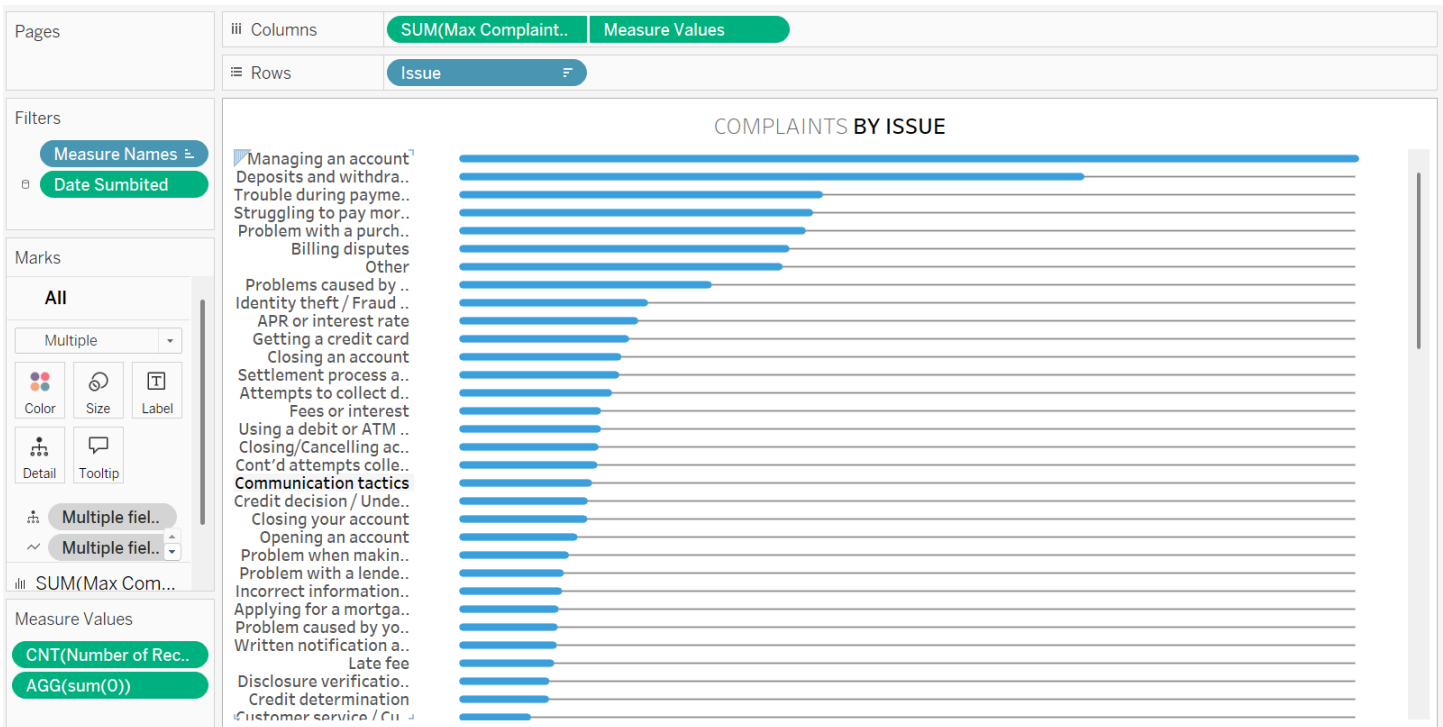
- **Timely Response to Those Complaints:** A critical KPI that tracks the percentage of complaints responded to within the expected time frame.
 - **Tableau Calculated Field:** Used to compute the ratio of complaints with a timely response to the total number of complaints. This is visualized as a percentage and updated dynamically based on the date filter.



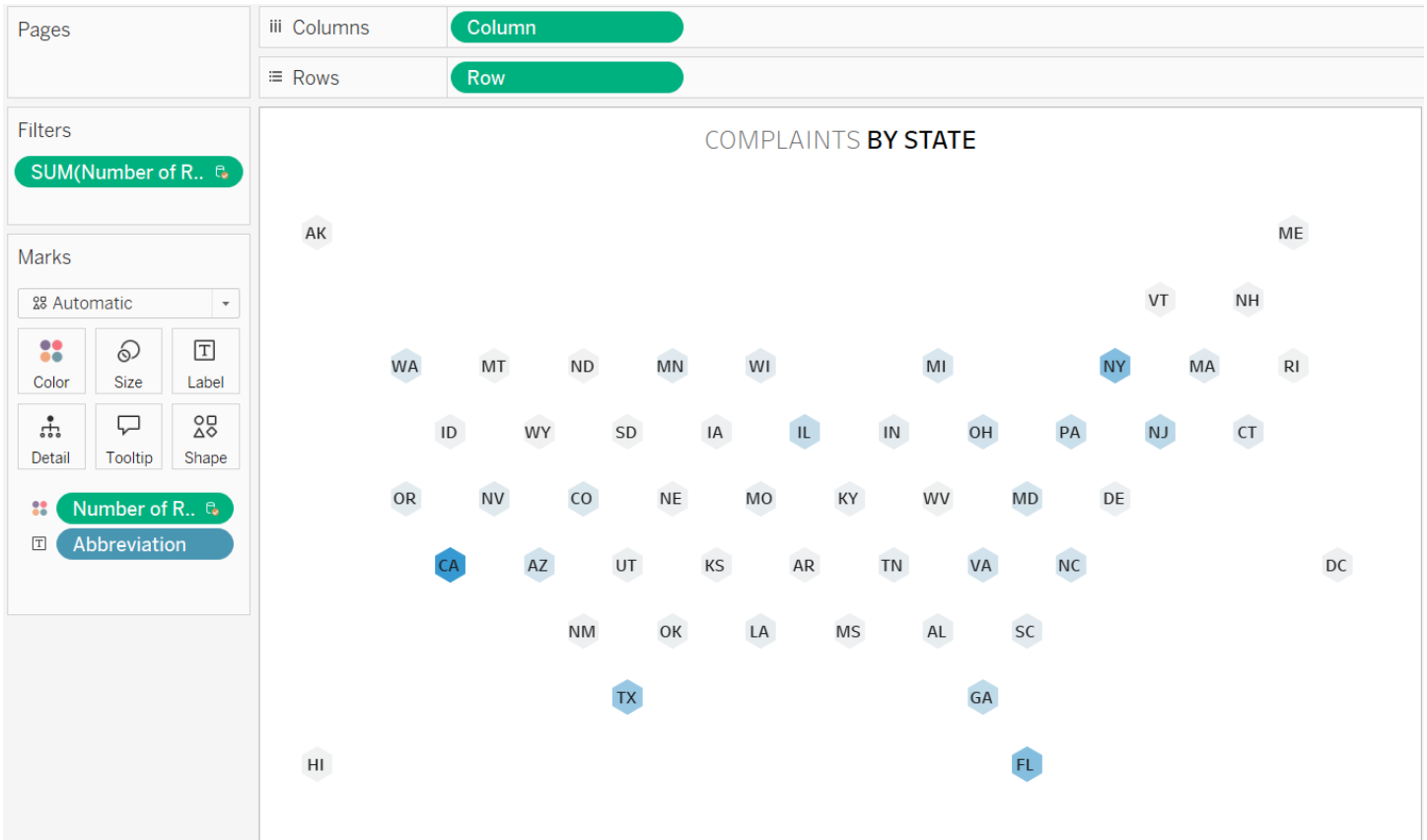
- **No. of Issues Resolved at No Cost:** This metric shows the percentage of complaints resolved without the consumer incurring any financial costs, a key measure of how effectively companies are addressing consumer concerns.
 - **Tableau Pie Chart:** This data is broken down into resolved vs. unresolved complaints at no cost, allowing for quick insights into the efficiency of complaint resolution.



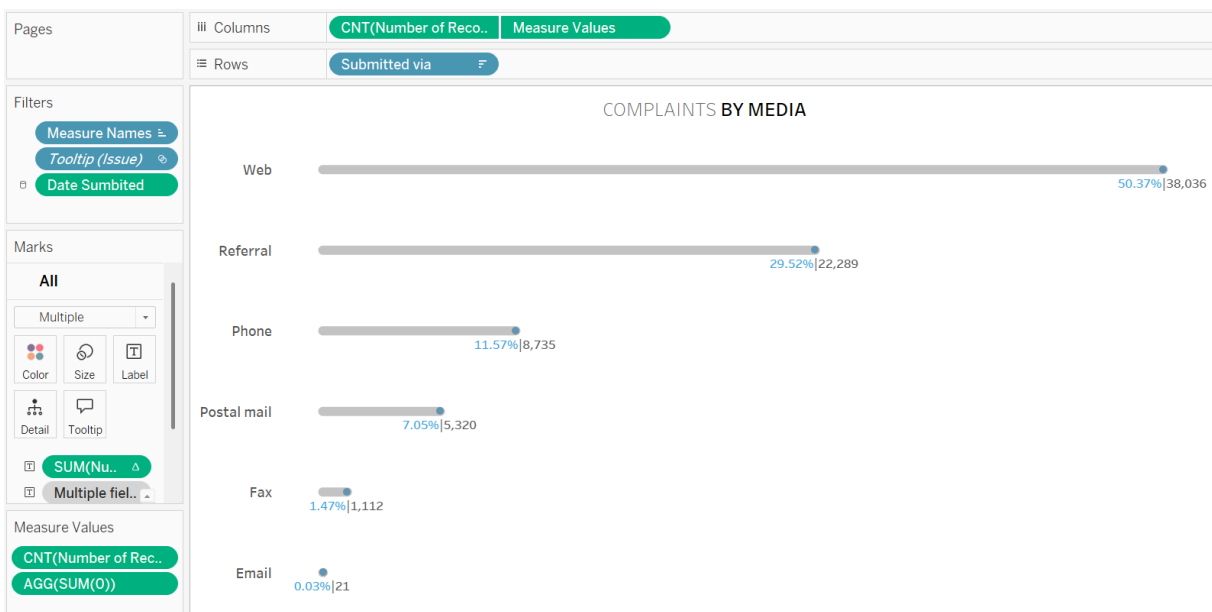
- **Complaints Associated with Different Types of Issues:** This section shows the distribution of complaints by the type of issue reported, such as billing disputes, identity theft, or fraud.
 - **Tableau Bar Chart:** A horizontal bar chart breaks down complaints by issue type, allowing users to quickly identify the most common issues consumers are facing.



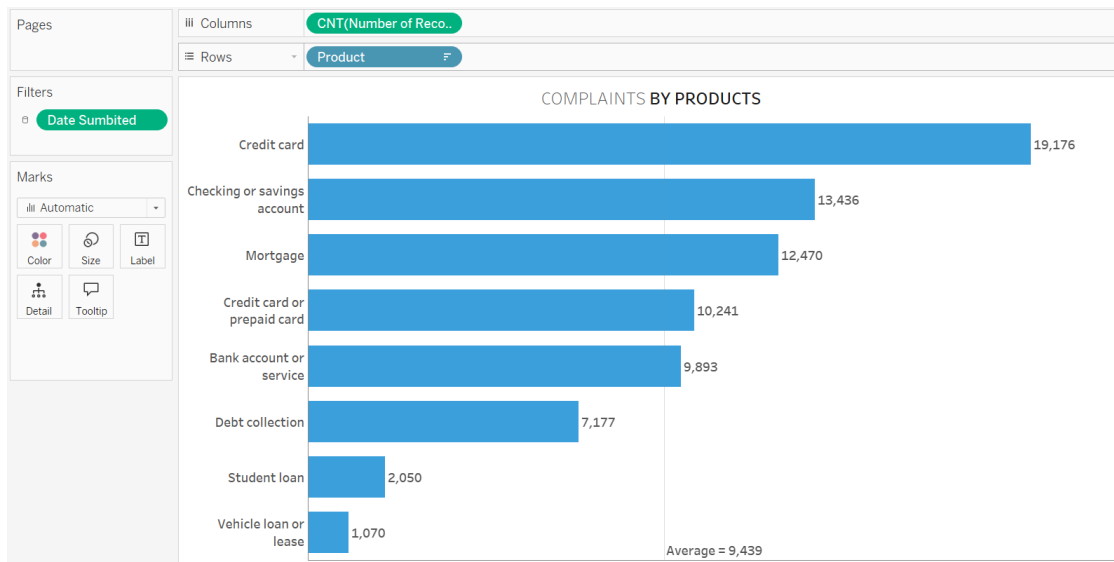
- **Complaints Submitted by Different States:** A geographical breakdown of complaints helps in understanding which regions report the most dissatisfaction.
 - **Tableau Map:** An interactive map (hexbin chart) visualizes complaints by state. The map highlights states with the highest number of complaints, enabling region-specific analysis.
 - **Color Encoding:** States with higher complaints are shaded in darker colors, providing an immediate visual cue for areas of concern.



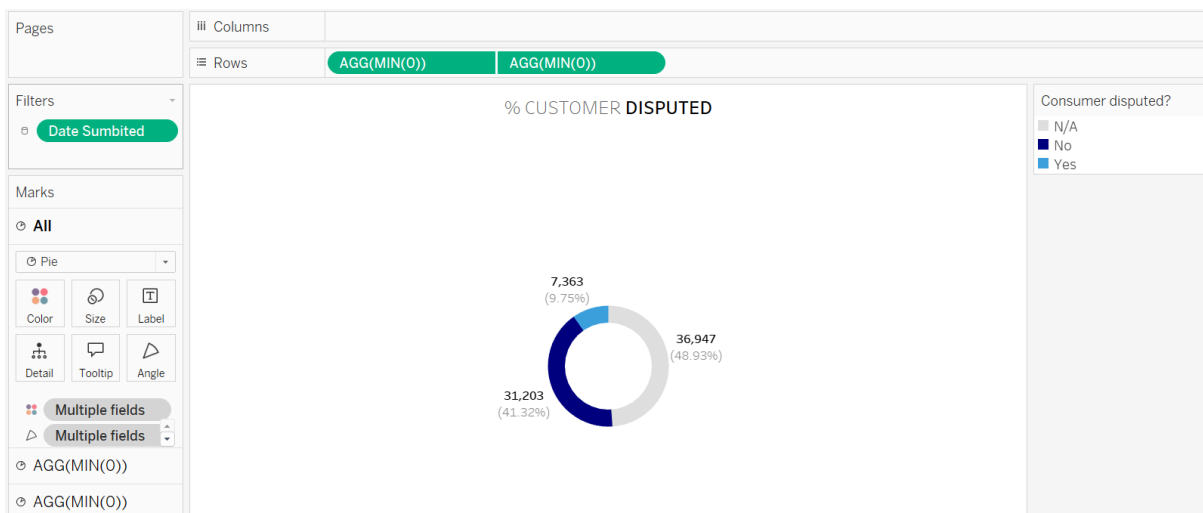
- Complaints by Media:** This section shows the method consumers used to file complaints, such as through the web, phone, or mail.
 - Tableau Stacked Bar Chart:** This visualization helps identify the most commonly used channels for submitting complaints, allowing organizations to focus on optimizing those channels.



- **Complaints Associated with Different Products:** This breakdown shows which financial products (e.g., credit cards, mortgages) are most frequently associated with consumer complaints.
 - **Tableau Bar Chart:** Complaints are categorized by product type, providing a clear view of which products are causing the most issues for consumers.

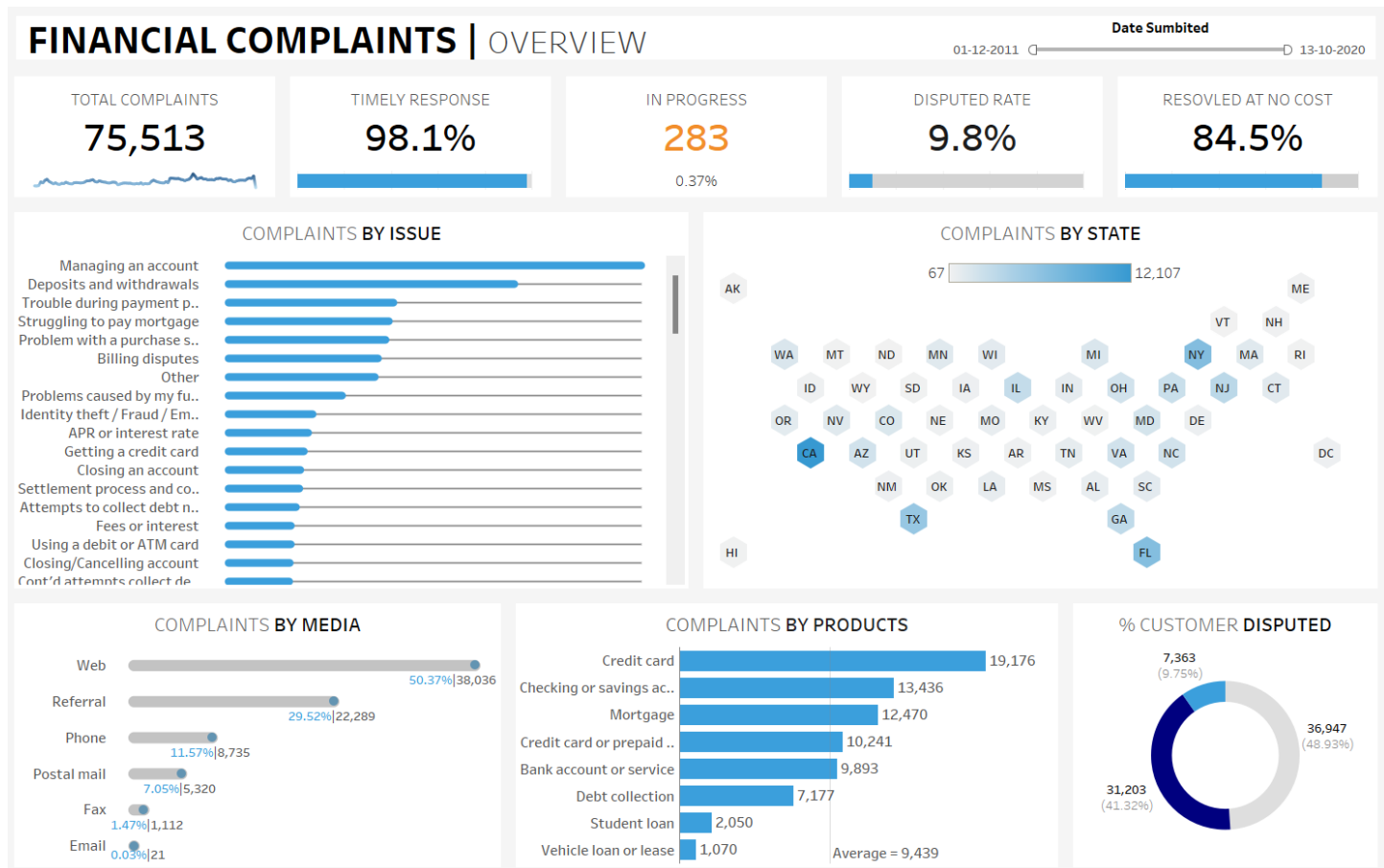


- **Disputed Customers Percentage:** This key metric shows the percentage of customers who disputed the resolution of their complaints. It gives an indication of how satisfied consumers were with the company's response.
 - **Tableau Donut Chart:** The percentage of disputed complaints is visualized with a donut chart, making it easy to see how many consumers were dissatisfied even after a resolution was proposed.



IV. Interactivity and User Experience:

- **Date Range Selection:** At the top right of the dashboard, users can select a custom date range. This selection will dynamically filter the entire dashboard, updating all visual elements (maps, charts, KPIs) to reflect the data within the chosen time period.
- **Hover and Drill-Down Features:** The dashboard includes interactive elements that allow users to hover over specific states, issues, or products to see more detailed complaint information. Drill-down capabilities enable deeper exploration of complaint trends.



Chapter 5: Result

- I. From 2012 to 2021, a total of 75,513 complaints were filed, reflecting substantial customer feedback on financial services.
- II. Out of these, only 283 complaints are still in progress, showing the responsiveness of the financial institutions in resolving cases.
- III. Disputed complaints make up 7,363 cases, suggesting that around 10% of the complaints escalated beyond the initial resolution process.

- IV. Web-based submissions dominate as the primary channel for filing complaints, with approximately 40,000 complaints coming through online platforms, showcasing the importance of digital infrastructure for consumer interaction.
- V. Credit cards remain the most contentious product, as they were involved in the majority of the complaints, suggesting that credit card-related services and policies may need careful scrutiny and improvements to reduce dissatisfaction.

Chapter 6: Conclusion and Future Scope

The **Financial Consumer Complaints Dashboard** serves as a dynamic, automated tool for visualizing consumer complaints, uncovering critical insights to support data-driven decision-making. The dashboard offers a comprehensive view of key metrics such as total complaints, timely responses, disputes, and resolutions, allowing stakeholders to identify trends, root causes of consumer dissatisfaction, and areas for service improvement.

- The majority of complaints (75,513) relate to products like credit cards, checking/savings accounts, and mortgages, with a notable 50% of complaints being submitted via online platforms.
- While 98.05% of responses were delivered in time, 283 complaints remained in progress, representing just 0.37% of the total. This indicates that financial institutions are efficient in their responses.
- Credit cards emerged as the product with the highest number of complaints, while managing an account was the most frequently cited issue, suggesting the need for focused improvements in these areas.
- The use of visual elements like hex maps, lollipop charts, and donut charts provided a clear and interactive understanding of the data.
-

The dashboard successfully delivers actionable insights by analyzing key performance indicators (KPIs), and by automating updates with new data, it ensures that decision-makers have access to real-time information.

Future Scope:

- I. **Enhanced Data Segmentation:** Future iterations of the dashboard could offer further segmentation, such as by demographics (age, gender) or income brackets, to uncover deeper insights into complaint patterns across various consumer groups.
- II. **Predictive Analytics:** Integrating machine learning algorithms could allow for predictive modeling, enabling organizations to anticipate future complaint trends, identify potential issues before they escalate, and proactively enhance customer service offerings.
- III. **Sentiment Analysis:** A future addition could be incorporating NLP (Natural Language Processing) to perform sentiment analysis on complaint descriptions. This would offer

deeper insights into the emotional tone behind the complaints and help identify areas of high consumer frustration.

- IV. **Expanded Product Coverage:** While credit cards and savings accounts were highlighted, the dashboard could be expanded to cover other financial products, such as cryptocurrencies, insurance, or investment services, to stay ahead of emerging trends and consumer concerns.
- V. **Interactive Customer Feedback:** Incorporating real-time feedback mechanisms directly into the dashboard, where customers can voice concerns or rate services after a complaint resolution, would give organizations a continuous pulse on customer satisfaction.
- VI. **Mobile-Optimized Dashboard:** As most complaints are submitted via online platforms, providing a mobile-optimized version of the dashboard would improve accessibility for employees and stakeholders, allowing them to monitor key metrics and complaints on the go.