TRUIST

Enhancing Technology Trust in Wealth Customers Through NLP Solutions

Emory MSBA 2023 Team Truistars

Agenda

1. Problem Statement & Business Goals
2. Data Sources
3. Modeling & Tools
4. Operational Integration
5. Cost-Benefit Analysis
6. Timeline

Problem Statement & Business Goals

Background & Significance of Problem

The banking industry has witnessed a huge surge in investments directed toward technological advancements in recent years, and Truist is a notable participant in this transformative wave. In 2022 Annual Report, Truist highlighted **T3, or Touch + Technology = Trust**, as their most significant innovation of the year. Throughout the year, Truist rolled out a range of technological advancements, introducing offerings like Truist Assist, Truist Invest Pro, and Truist Trade. Additionally, they strategically acquired companies, notably Long Game, which now serves as the cornerstone of their in-house innovation entity, known as Truist Foundry. To enhance the mobile banking experience, Truist significantly increased their production releases, tripling their output across various sectors, including business, retail, and wealth, compared to the previous year.

Problem

Truist explained the increase in their adjusted expenses, which they attributed to “purposeful investments we made in talent, technology, and acquisitions—which we’re confident will create value in the future” as stated in the Truist 2022 Annual Report.

Despite Truist's optimism about deriving significant value from their investments, it was observed that **Wealth Customers had limited usage of Truist’s mobile experience** due to their low level of trust in its security.

Task

Use market research and available data to propose an analytical method for identifying the specific security concerns of Wealth Customers and evaluating their trust in mobile banking services.

Problem Scope

Business Units
Truists Wealth Customer Team

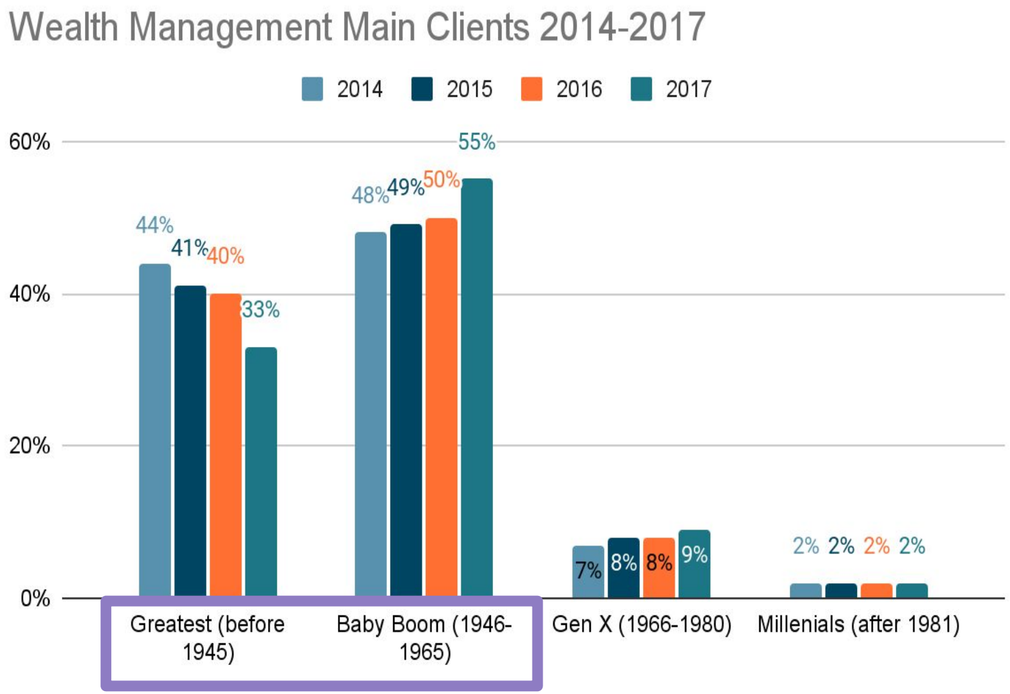
Regions
US domestic market

Timeline
16 weeks

“Wealth” Customers are over 50-70 Age Bracket for the Past 10 Years which puts Emphasis on Leveraging Customer Satisfaction Analysis and Retention Behavior

Age Group	Med Net Worth	Avg Net Worth
Under 35	$13,900	$76,300
35-44	$91,300	$436,200
45-54	$168,600	$833,200
55-64	$212,500	$1,175,900
65-74	$266,400	$1,217,700
75+	$254,800	$977,600

age demographic on avg net worth in US 2023, federal reserve



Wealth Management Main Clients Age Demographic 2014-2017, McKinsey

“... almost third (29%) were over 65, with (69%) over 50. Among them, (43%) stated that their client’s average portfolio was $1m to $5m and a third 32% saying that their biggest clients controlled over $1b.”

Wealth Management Demographic, PwC

Within the banking sector in the US, individuals aged between 50 to 70 predominantly constitute the affluent customer demographic. These wealth clients bring substantial assets and exhibit distinct customer behaviors for Truist to look at their retention strategies

To foster enduring loyalty among these wealthy clients, Truist should invest in Customer Satisfaction Analysis models to facilitate long term retention rate and engender trust

Low Trust Among Affluent Seniors Due to Banking Security Lapses

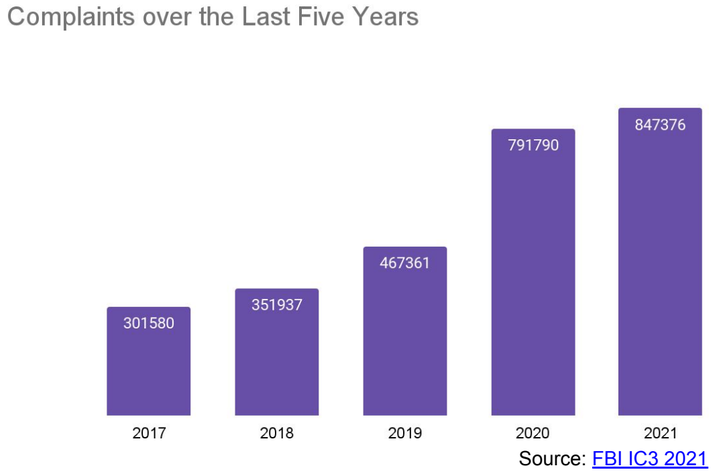
Security Problems

Past Incidents

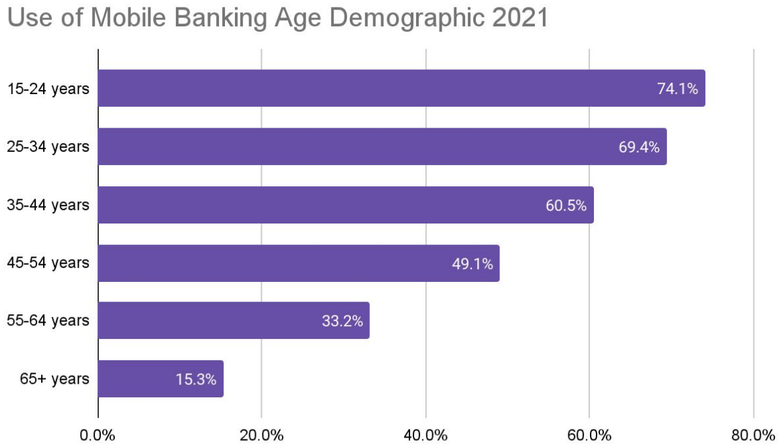
- Equity loan issuing error
- False notification error
- Fraudulent check issuing
- Debit card Transaction error
- Target for Scammers

Overall, Truist customers have low trust with banking security in the recent years due to errors in merging 2 different information systems (BB&T + SunTrust)

High Risk Attacks Online → Low Use of Tech



Source: FBI IC3 2021



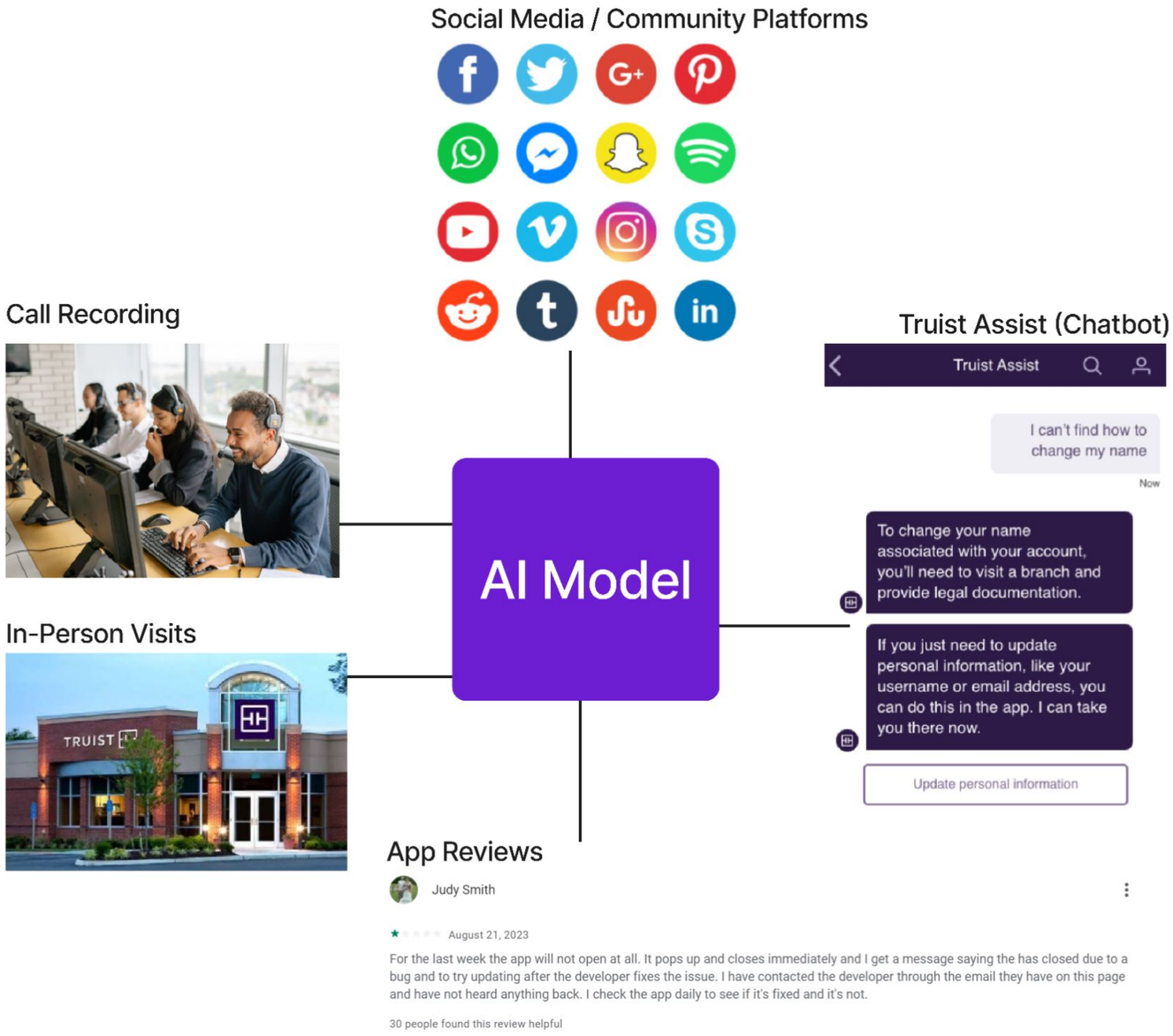
- Senior citizens lost $1.7 billion as victims of online crime in 2021, and the U.S. has seen a 400% increase in internet crime toward this age group in the past five years. (Morgan Stanley)

- We can assume that seniors who are threatened of online crime caused the issue of only 15.3% of them using mobile banking apps in 2021 (Accenture, FDIC)

Customer Satisfaction Approach

We propose a **reusable** approach that involves leveraging customer chatbot data and feedback data from various sources, including social media reviews, chat logs, and customer reviews, to gain valuable insights into **security**-related topics and customer sentiments. With the advantage of providing a systematic and data-driven method to proactively identify security-related concerns and sentiments among customers to help the bank to enhance its security measures and address customer concerns promptly.

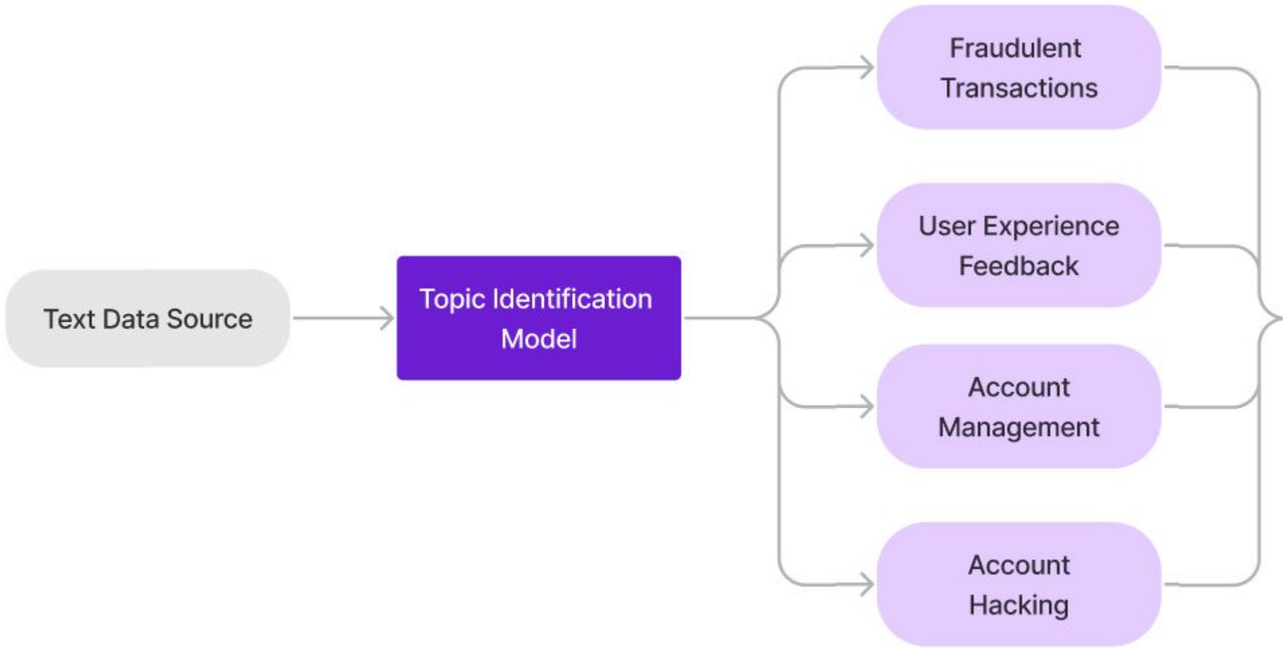
Text Data Sources



- Since seniors have low trust and familiarity with tech, they tend to visit branches and make phone calls to fulfill their requests. Therefore, it is important to collect and make use of the data from those sources.
- It is important to note that Truist may need consent from its customers to process their data.
- Truist can also collect text data using web scraping technique.
- Take Reddit for example, allows data scraping with permission.

Modeling & Tools Step 1. Topic Identification

- Using AI pretrained models to identify the main topics within customer conversations.
- **BERTopic** Model is a flexible topic modeling framework that allows for the generation of topics from input data.



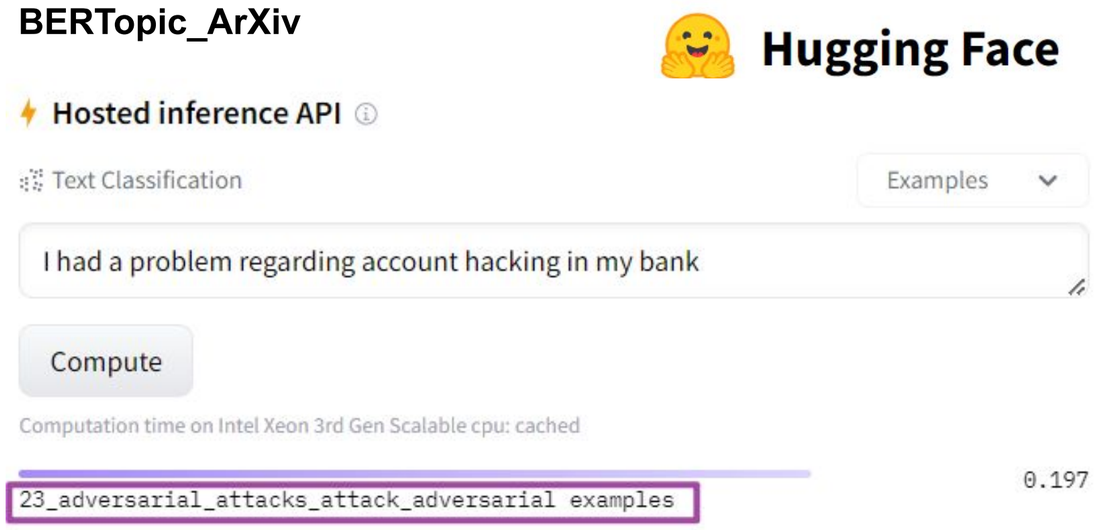
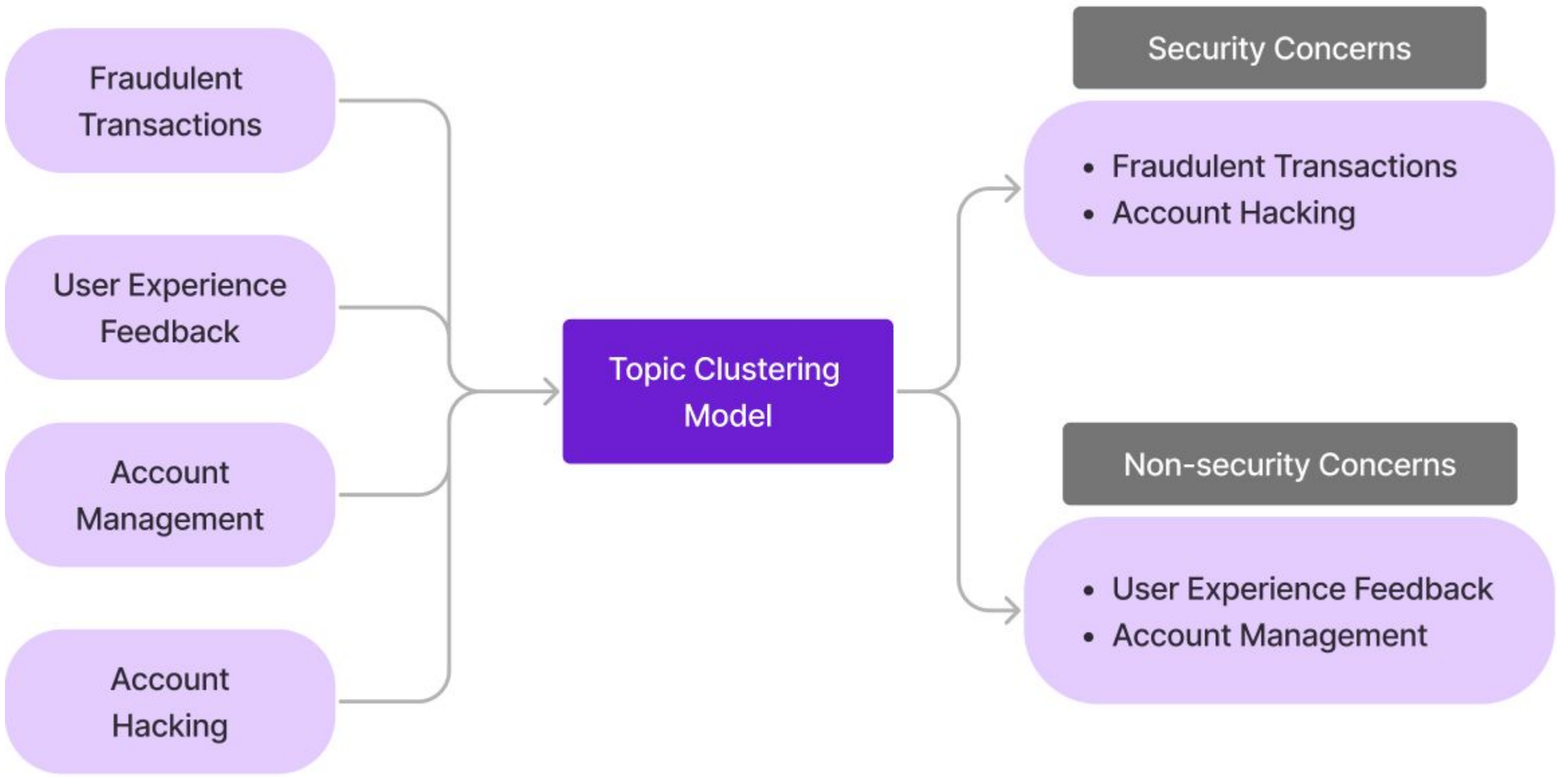


Image Credit: Hugging Face

Modeling & Tools Step 2. Topic Clustering

- Cluster topics related to their similarity, here in our context our main focus point is security.
- Examples of topic clustering models include OpenAI’s GPT Embeddings.
- Another statistical method we can use is K-Means clustering.



OpenAI’s Embedding

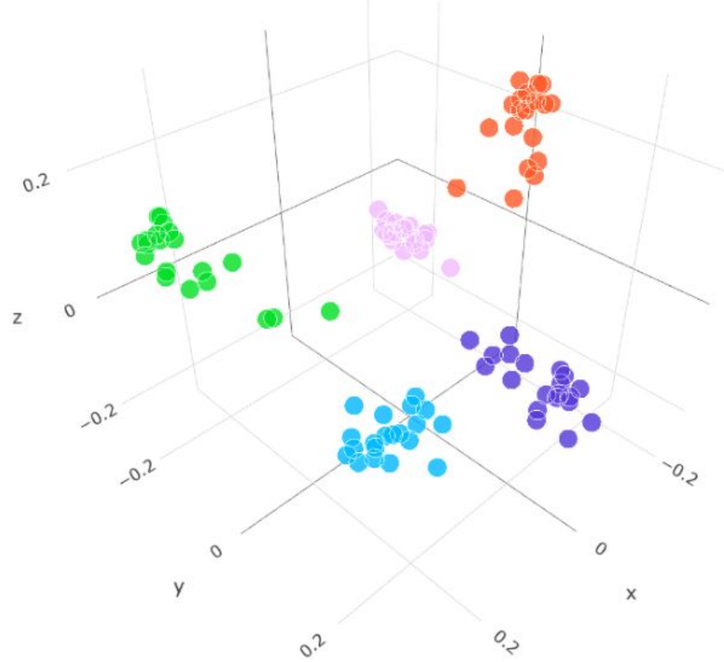
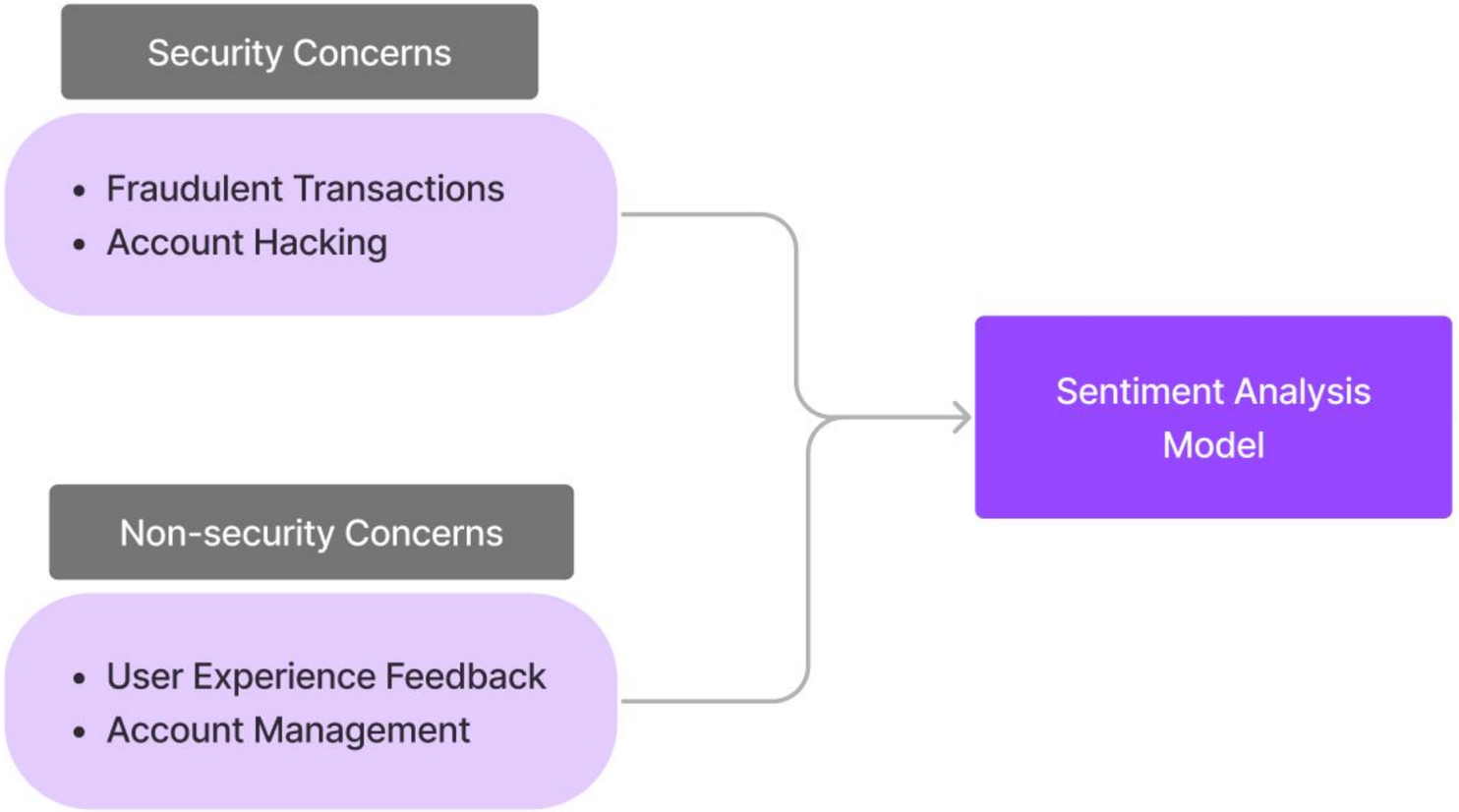


Image Credit: OpenAI

Modeling & Tools Step 3. Sentiment Analysis

- For each text data in the security-related clusters, perform sentiment analysis to determine whether the sentiment is positive, negative, or neutral, and their respective severity.
- Utilize pre-trained sentiment analysis models like VADER, TextBlob, or a custom-trained deep learning model such as ROBERTA.



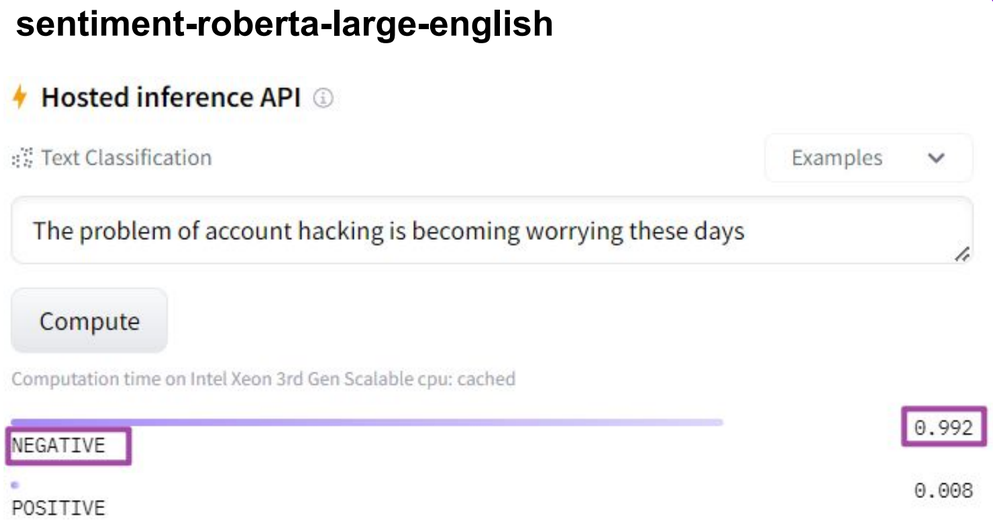
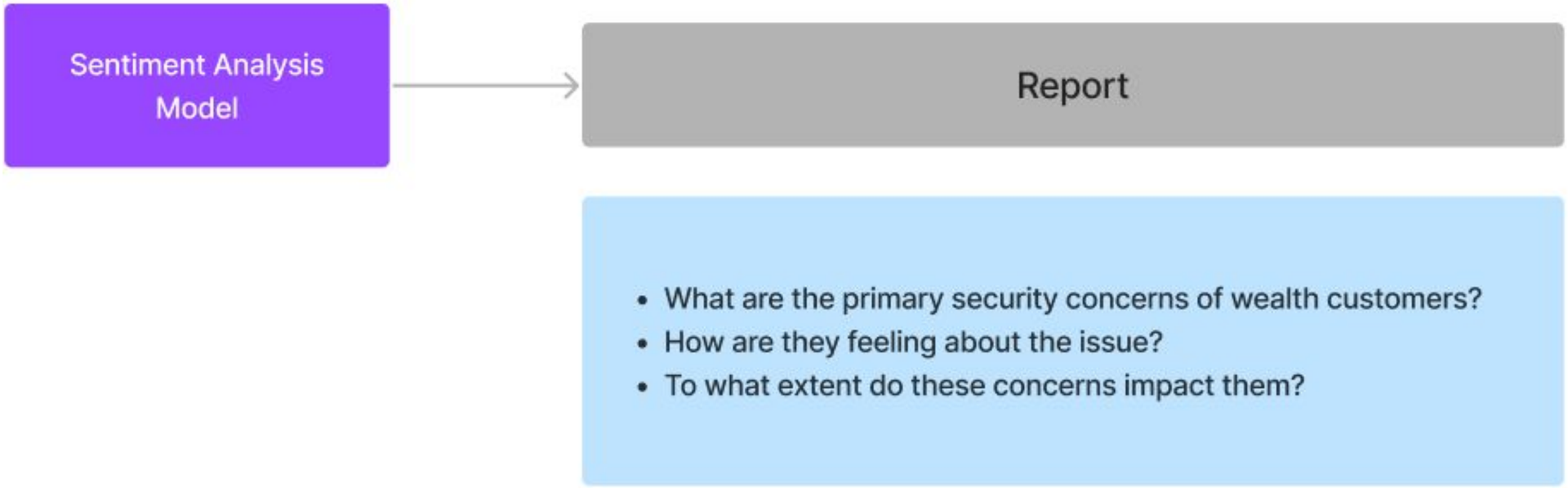


Image Credit: Hugging Face

Modeling & Tools Step 4. Report

- Generate an automatic report summarizing the insights from the analysis for each security-related topic.
- Include information on the sentiment, severity, and main security concerns raised by customers.



Operational Integrity

Model Integration

The approach's integration will involve an API connection to diverse data sources, such as customer chatbot data, and available reviews through APIs, and then linking them to the finely-tuned models already in place. Overall, this streamlined integration process guarantees a cost-effective and timely implementation.

Model Reusability

The Proposed model approach is not limited to detecting security concerns in text data, it can also be extended to capture other various topics present in user data. Therefore, it has the potential to be customized for any subject matter that the bank may be interested in.

Cost Analysis: Tech Perspective

Defining Aspect

Tech Perspective Cost Analysis refers to evaluating the economic implications of technology choices, focusing on understanding the costs associated with building, maintaining, and improving technology systems.

Contextual Focus

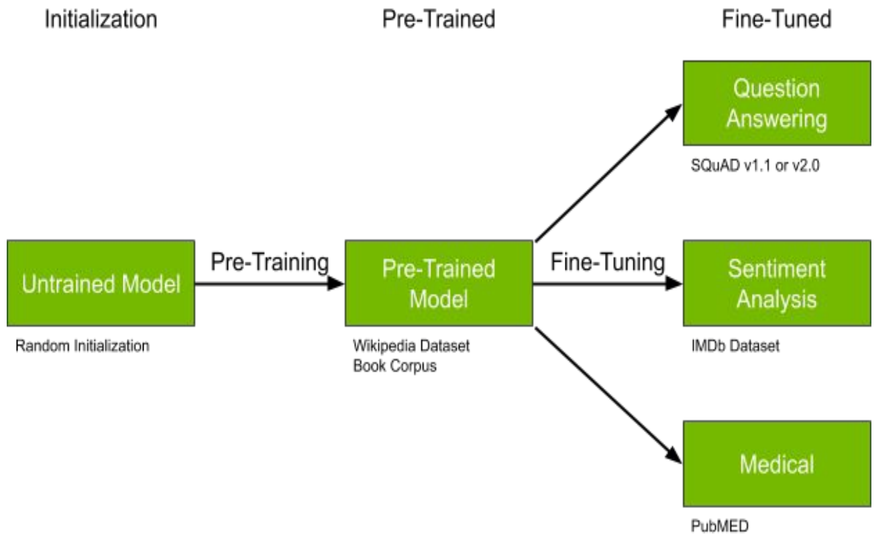
In this presentation, we focus on comparing the costs between utilizing pre-trained models and building models from scratch in machine learning.

Objective

The aim is to weigh the financial investments, human capital requirements, and potential revenue implications of each approach, providing a clearer picture to make informed decisions that align with organizational goals and resources.

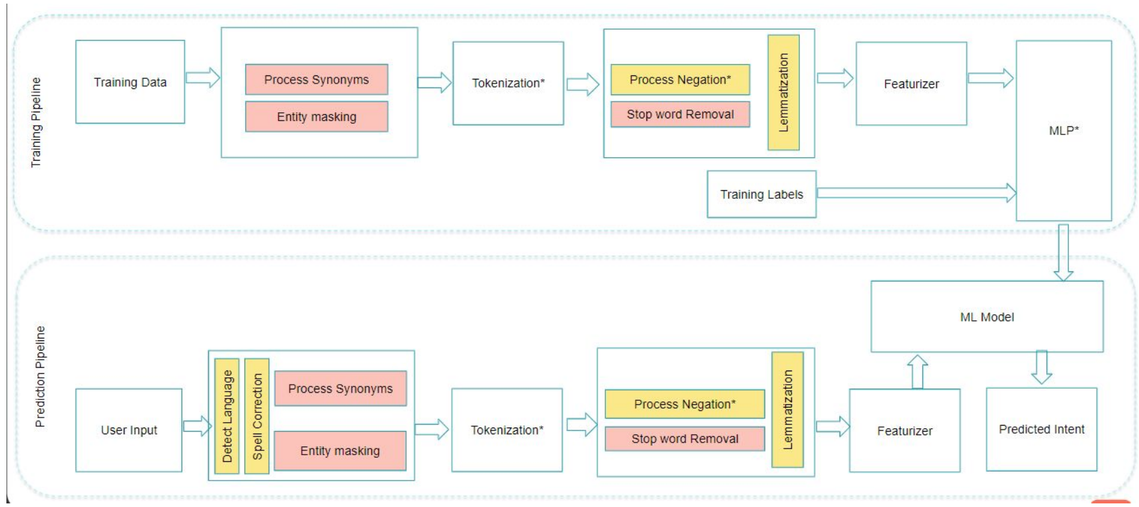
Pre-trained Models VS Building from Scratch

Leveraging existing models, already trained on substantial data, adapted for specific tasks with minimal training.



Source: Nvidia

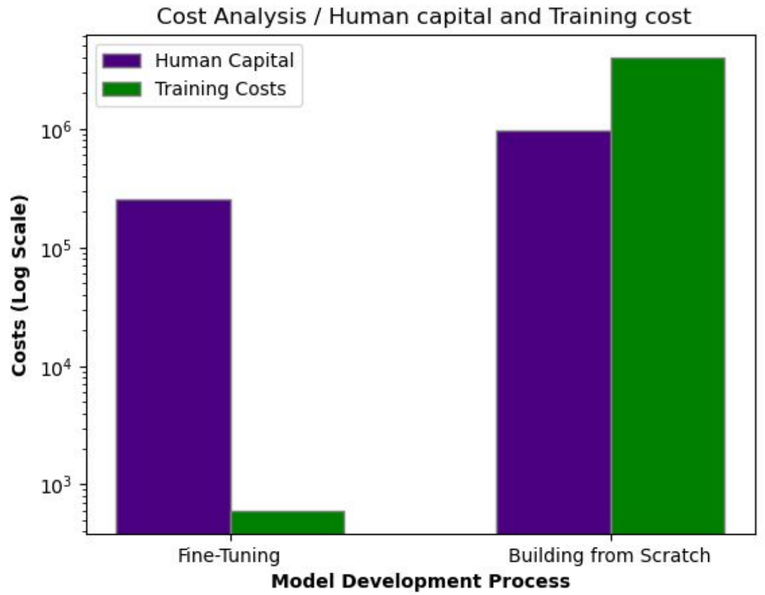
Creating a unique model, necessitating extensive research, development, and training on a suitable dataset.



Source: Kore.ai

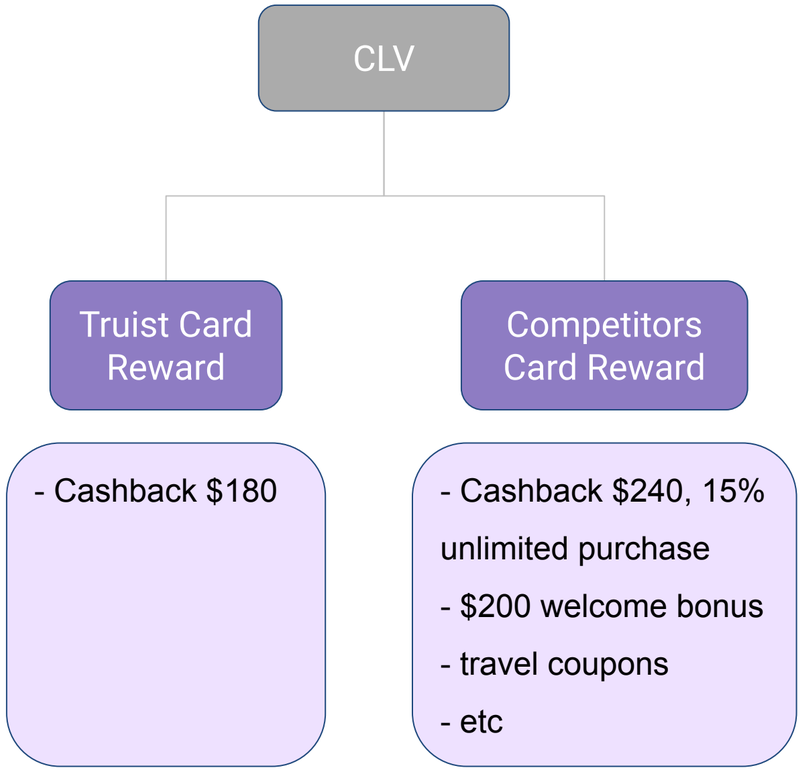
Cost Analysis: Pre-trained Models vs Building from Scratch

Cost Components	Pre-trained Models	Building From Scratch	References
Resources (Time, computes, data)	- Takes days to weeks to train [1] - Moderate computing power [2] - Small dataset for fine tuning	- Months to years to train [3] - Significant strong computing power [4] - Huge and diverse datasets [5]	[1]: Source, [2]: Source, [3]: Source, [4]: Source, [5]: Source
Training Costs	Around $600 [1][2]	Over $4 million [3]	[1]: Source, [2]: Source, [3]: Source
Maintenance	Occasional updates & re-tuning [1] [2]	Regular updates & refinements [3]	[1]: Source, [2]: Source, [3]: Source
Human Capital	Two ML engineers (2 * $127,448 = $254,896) [1] Total: $ 254,896 / Annual	- Research Scientists (3 * $115,594 = 346,782) [2] - Machine Learning Engineers & Data Scientists (4 * $127,448 = 509,792) [1] - DevOps Engineers(1 * $109,194 = $109,194) [3] Total: $ 965,768 / Annual	[1]: Source, [2]: Source, [3]: Source



This graph contrasts the human capital and training costs of fine-tuning pre-trained models and building models from scratch. The use of a log scale elucidates the substantial disparities in costs, enabling clearer visual comparisons

Utilize Customer Lifetime Value (CLV) to Enhance Competitive Loyalty Programs and Generate Long Term Profit



Hypothetical Card Reward Package for loyal customers:

2% cashback on all purchases + no annual fee + $100 annual fee after 1st year + APR 25% + interchange fee of 2% per spending

Customer with $10k Spending	**Bank** *if customer doesn't pay off balance immediately and carries over to next month, bank earns interest and make a profit
Cashback Earned *= Total Spending Amt x Cashback Rate*	*Interest Earned* *= Total Spending Amt / 12 months * APR*
$10,000 x 2% = $200 total cashback	$10k / 12 * 25% = $208 interest earned $208 + $100*(n-1) + $200 = $408+ total earnings *Interchange Fee = $200 = $10k*0.02

After pooling highly satisfied and loyal customers from Sentiment Analysis, Truist can leverage CLV to formulate and refine competitive loyalty programs that not only resonate with affluent customer base but also drive sustained profitability over time. By understanding and responding to loyalty drivers of high net worth clients, Truist can foster deeper engagement and generate a profit pipeline.

Project Timeline

Diagnosis & Analysis → **Implementation Support**

	Phase 1: Review Current State & Identify Problem	Phase 2: Operating Model Design	Phase 3: Implementation Planning & Build Model	Phase 4: Testing & Deployment	Phase 5: Execution
Estimated Time	2 weeks	3 weeks	5 weeks	3 weeks	3 weeks
Business Questions (2 weeks)	- What's causing the highly frequent security issues in the upcoming years? - Whose our customer that brings us most wealth into the business?	- Organization design (how would focusing on customer satisfaction and aiming to improve it can change Truist's in scope and out of scope functions? - How do we streamline the business process and outsource non-core process?	- How can we identify mentions or concerns about security in the collected data ? - How can we analyse customer sentiment in regards to Truist's services?	- How can we validate the fine-tuned model's accuracy in real-world scenarios ? - Is our model correctly identifying security related words?	- Rigorously track progress of initiatives - oversee execution of roadmaps
Analytical Tasks + Tools	- Customer Satisfaction Analysis - CLV Analysis - Customer Segmentation - Business Mix and Operations Analysis	- Focusing on customer Satisfaction Analysis - Analyze high level KPIs from Truist's 'Wealth' sector in its business mix	- Security keywords Identification - Sentiment Analysis - Natural Language Processing (NLP) toolkits (e.g., NLTK, spaCy) - Pre-trained models (for fine-tuning)	- Model Testing - Testing Frameworks (e.g., TensorFlow's testing suite) - Deployment tools (e.g., Docker for containerization)	
Data Sources	- Truist's banking demographic (Age, gender, wealth, customer since when, etc)		- Historical customer reviews - Banking transactions logs	- New, unseen customer reviews - Recent banking transactions	

Change Management & Stakeholder Engagement → **Change EPMO**