Topic:

Feature Engineering & Exploratory Data Analysis

Authors:

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Overview:

Main Objective:

Financial institutions in the US are changing rapidly. Changing business models and the technological revolution has fueled the growth of a new breed of financial products and services are collectively known as Fintech. With changing demographics, automation efforts and demand for new products and services, large financial institutions are realizing the power of technologies like data science, AI, cloud technologies and machine learning and are heavily investing to upgrade their technology platforms to cater to the upcoming revolution. Technology has been a key player in helping drive this revolution. Things are fast evolving and as we enter 2019, it is interesting to understand the hiring trends in the top financial institutions in the US.

The goal of this exercise is to build a dataset with features that can be used to analyze hiring trends in Fintech in the 24 largest banks by market cap in the United States

Methodology:

We have divided Each part in a module which illustrates entire methods which we used to achieve the main objective.

Module 1: DATA PREP AND PRE-PROCESSING

Module 2: FORMING CLUSTERS(Categories) FOR DIFFERENT AREAS IN FINTECH

Module 3: FEATURE ENGINEERING

Module 1:

We gathered data for all 24 banks and combined it to a single excel and did remove duplicates and missing data as well with the end goal being to find the hiring trends in the fintech area for the leading 24 banks in the united states. We then maintained one excel that had all the relevant information needed for processing further.

Module 2:

With the processed data from module 1 we then categorized by visiting the job description of each listing and identifying as to the clusters that can be formed and divided the words into fintech and non fintech words. There on each cluster has been grouped with words and then weighed to find the hiring trends.
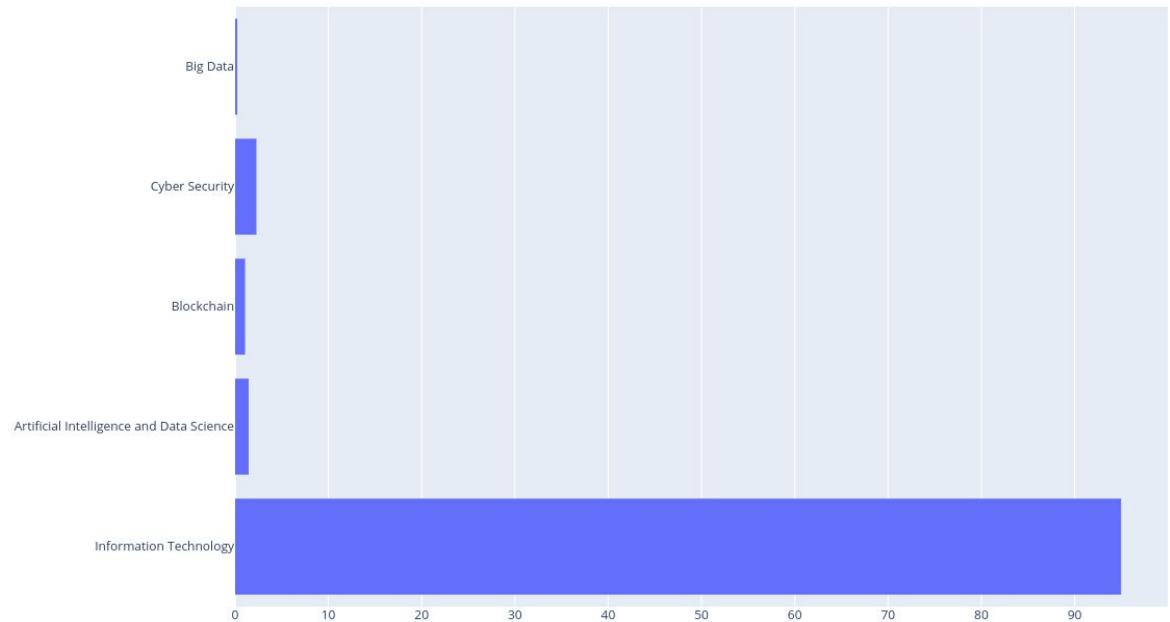
Module 3:

We have then extracted information pertaining to each job description so as to see what are the relevant positions and sectors currently looking for talent in that particular sector of fintech and also tried to gauge as to the where these banks are heading in terms of hiring trends.

Observations:

1. How are the top 24 banks hiring?

The goal here is to analyze the 24 banks to find their hiring trend in the fintech area. The hiring trends of top 24 banks are as follows -
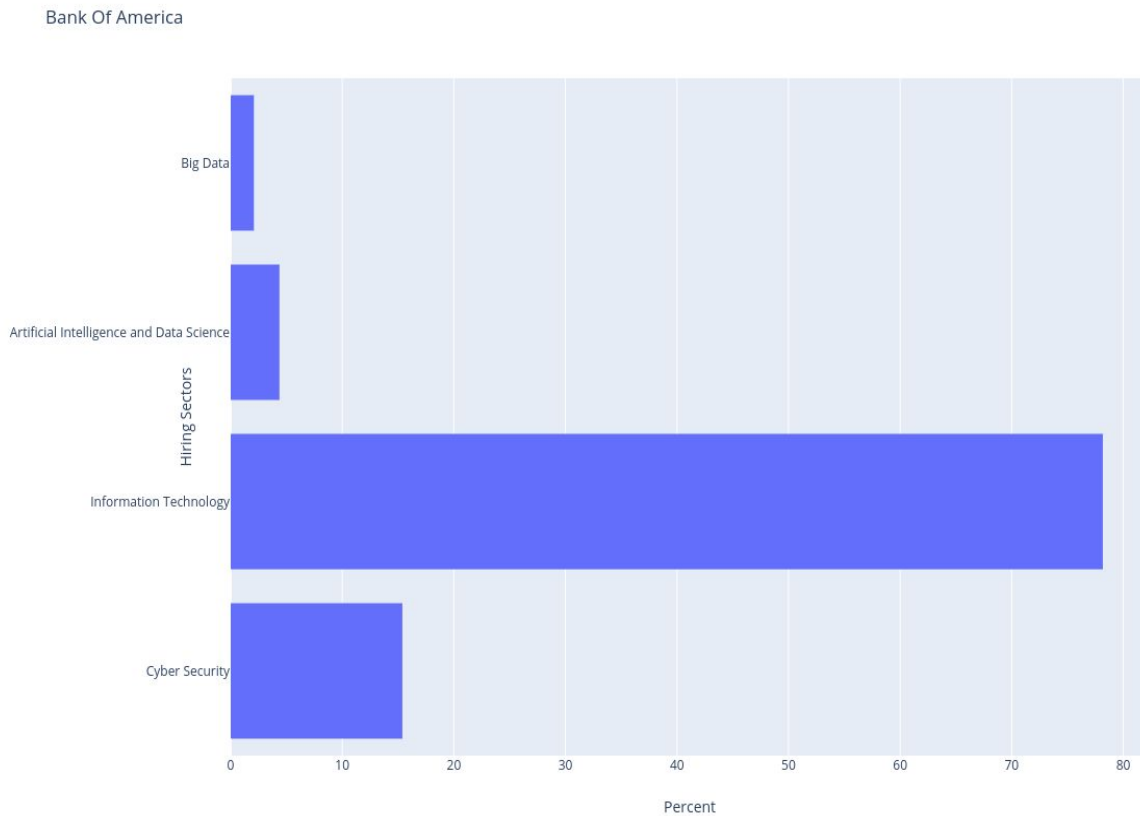
1. JP Morgan Chase:

JP Morgan's hiring trend states that it is looking for talents in Fitech areas wherein sectors like Information Technology, Artificial Intelligence and Data Science, Blockchain, Cyber Security and Big Data are in high demand as per the above data. Information Technology sector has a whopping 95% dominance in the demand area followed by jobs in cybersecurity at 2.2%

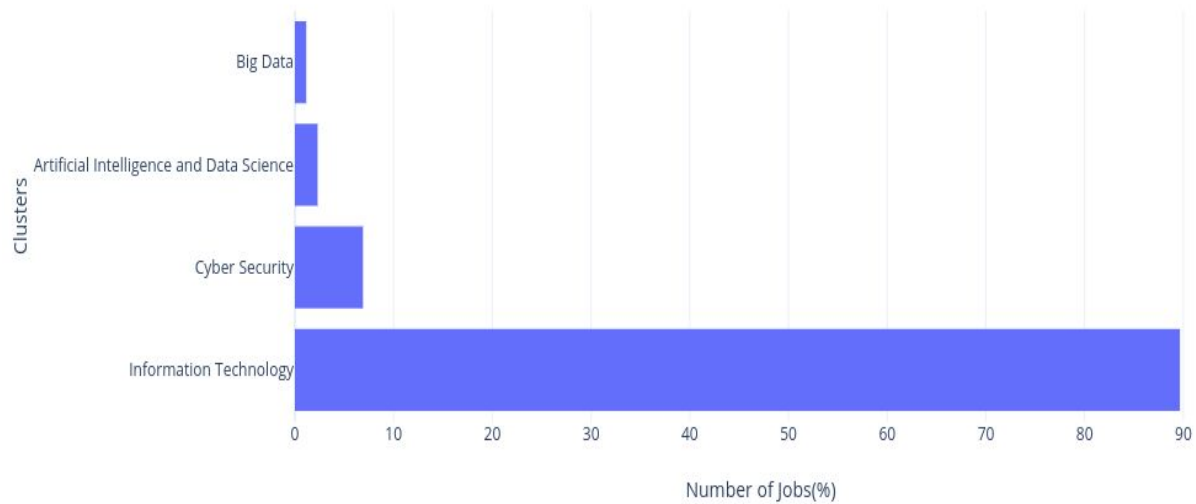*Target Sector - Information Technology*

2. Bank of America:

Bank Of America's hiring trend states that it is looking for talents in Fitech areas wherein sectors like Information Technology, Artificial Intelligence and Data Science, Blockchain, Cyber Security and Big Data are in high demand as per the above data. Bank of America seems to focus on other areas as well and not just Information Technology. We see IT at 78% standing in the demand area followed by jobs in Cybersecurity at 15.38% and delving into the new realm of Artificial Intelligence at 4% and Big Data at 2%

Target Sector - Information Technology & CyberSecurity
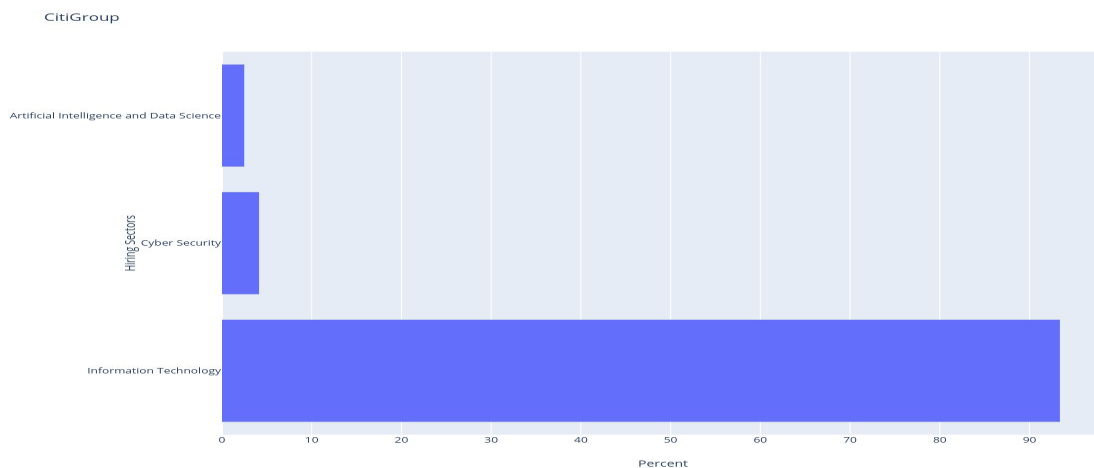
3. Wells Fargo:

Wells Fargo Hiring Trends in Fintech:

Wells Fargo hiring trend states that it is looking for talents in Fitech areas wherein sectors like Information Technology, Artificial Intelligence and Data Science, Cyber Security and Big Data are in high demand as per the above data. Wells Fargo does not seem to be looking to explore new talent in the blockchain sector. We see IT at 89% standing in the demand area followed by jobs in Cybersecurity at 6.69% and delving into the new realm of Artificial Intelligence at 2% and Big Data at 2%

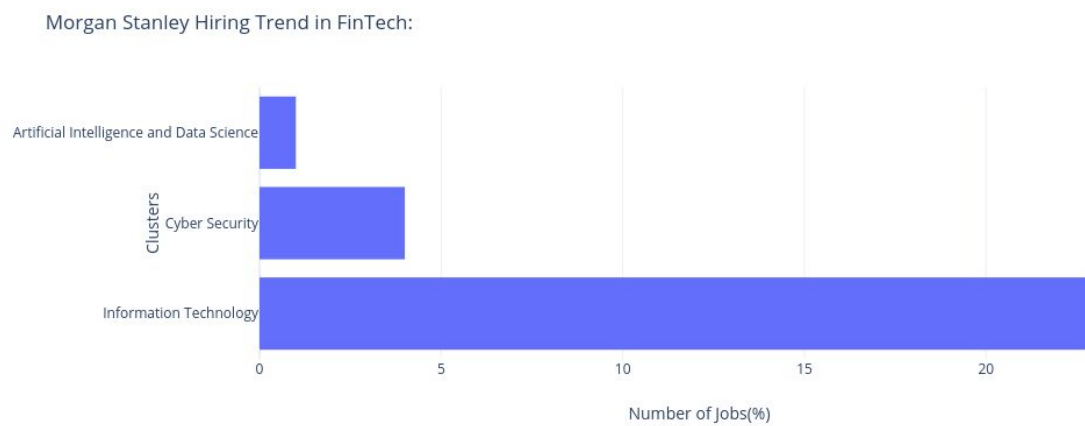*Target Sector - Information Technology & CyberSecurity*

4. CitiGroup Inc. :

Citigroup Inc hiring trend states that it is looking for talents in Fitech areas wherein sectors like Information Technology, Artificial Intelligence and Data Science, Cyber Security are in demand as per the above data. Citigroup does not seem to be looking to explore new talent in the big data & blockchain sector. We see IT at 93.4% standing in the demand area followed by jobs in Cybersecurity at 4% and delving into the new realm of Artificial Intelligence at 2%

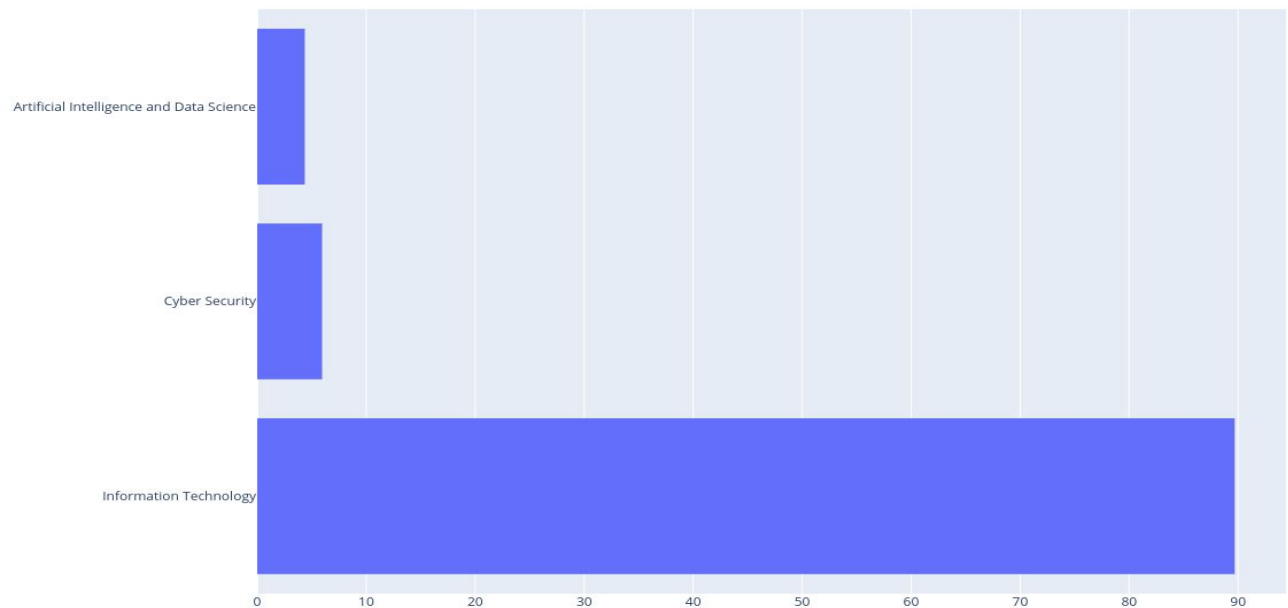*Target Sector - Information Technology*

5. Morgan Stanley:

Morgan Stanley Hiring Trend in FinTech:

Morgan Stanley hiring trend states that it is looking for talents in Fitech areas wherein sectors like Information Technology, Artificial Intelligence and Data Science, Cyber Security are in demand as per the above data. Morgan Stanley does not seem to be looking to explore new talent in the big data & blockchain sector. We see IT at 82% standing as the demand sector followed by jobs in Cybersecurity at 14% and delving into the new realm of Artificial Intelligence at 3.5%

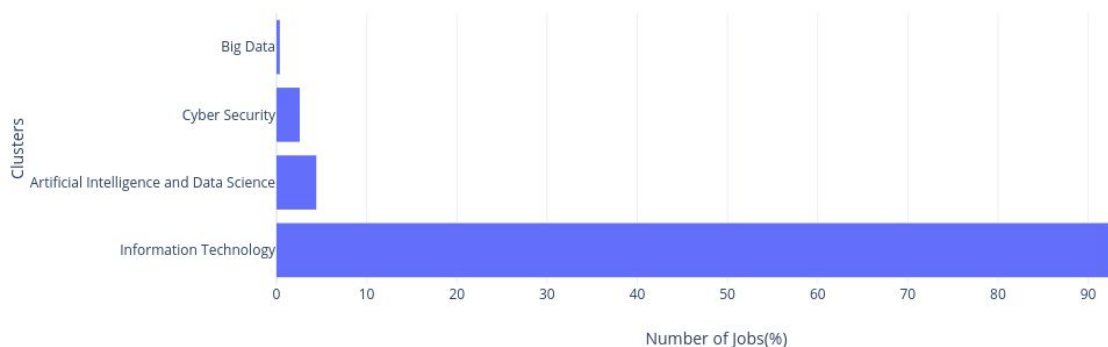*Target Sector - Information Technology & CyberSecurity*

6. Goldman Sachs Group:

Goldman Sachs hiring trend states that it is looking for talents in Fitech areas wherein sectors like Information Technology, Artificial Intelligence and Data Science are in demand as per the above data. Goldman Sachs does not seem to be looking to explore new talent in the big data & blockchain sector. We see IT at 89% standing as the demand sector followed by jobs in Cybersecurity at 6% and delving into the new realm of Artificial Intelligence at 4%

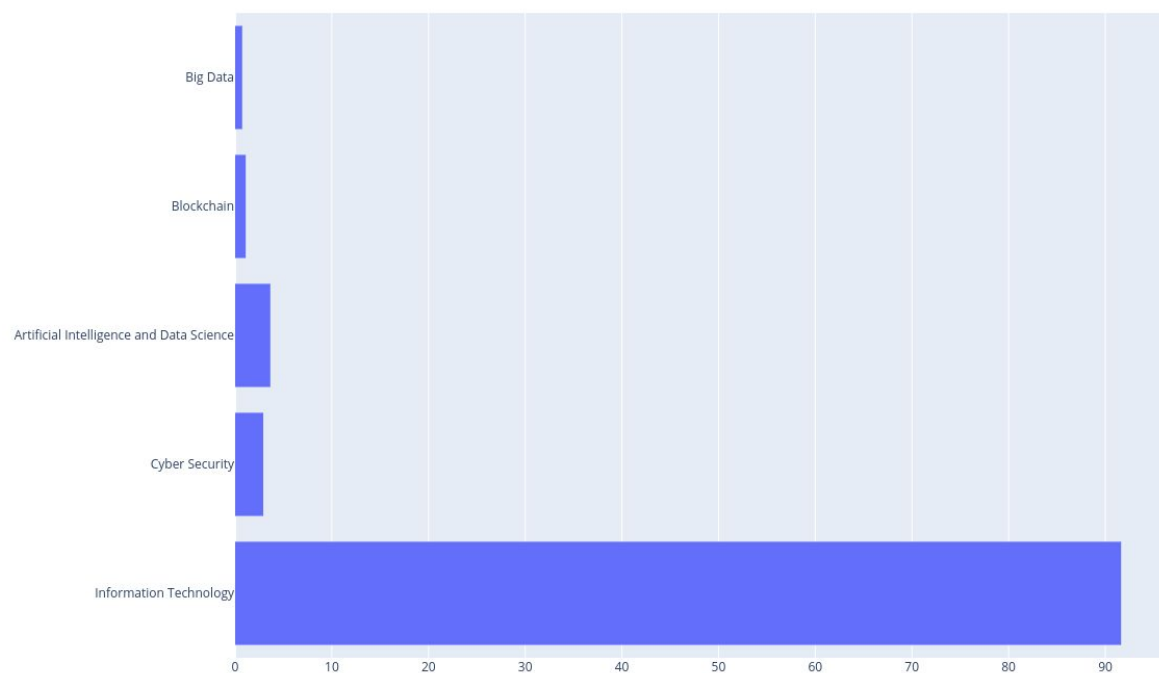*Target Sector - Information Technology*

7. U.S. Bancorp:

US Bank Hiring Trends in Fintech:

US Bancorp hiring trend states that it is looking for talents in Fitech areas wherein sectors like Information Technology, Artificial Intelligence and Data Science are in demand as per the above data. US Bancorp does not seem to be looking to explore new talent in the blockchain sector. We see IT at 93% standing as the demand sector followed by jobs in Cybersecurity at 2.5% and delving into the new realm of Artificial Intelligence at 4%
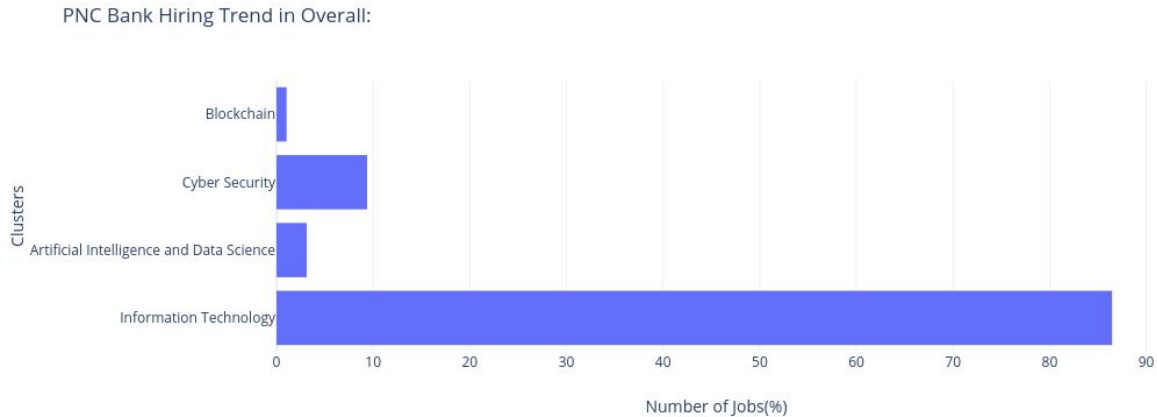
Target Sector - Information Technology

8. American Express:

American Express hiring trend states that it is looking for talents in Fitech areas wherein sectors like Information Technology, Artificial Intelligence and Data Science, Blockchain and Big Data are in demand as per the above data. We see IT at 92% standing as the demand sector followed by jobs in Cybersecurity at 2.9% and delving into the new realm of Artificial Intelligence at 3.6%, blockchain at 1% and big data at 0.72%
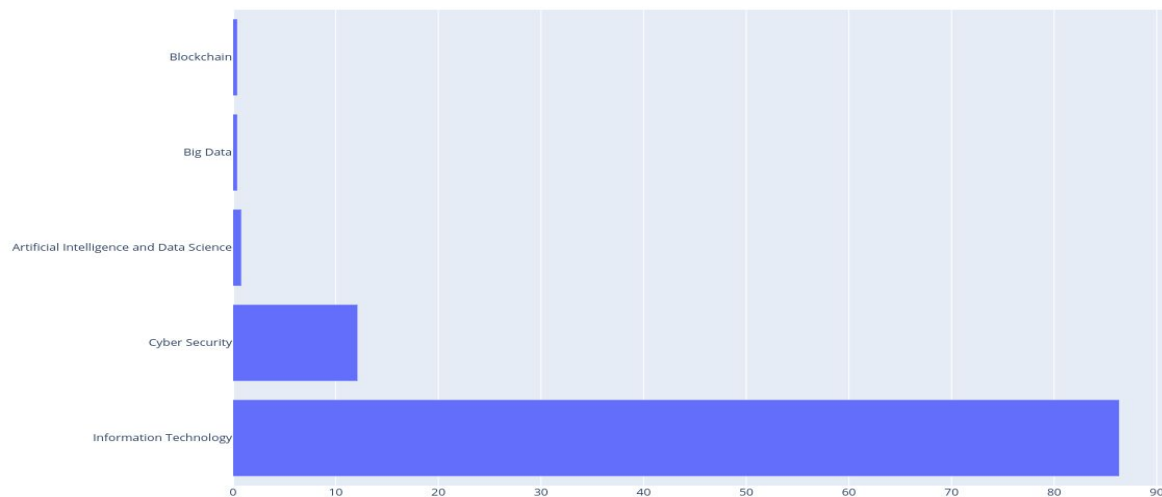
Target Sector - Information Technology

9. PNC Finacial:

PNC Bank Hiring Trend in Overall:

PNC Financial hiring trend states that it is looking for talents in Fitech areas wherein sectors like Information Technology, Artificial Intelligence and Data Science, Blockchain and Cyber security are in demand as per the above data. We see IT at 86% standing as the demand sector followed by jobs in Cybersecurity at 10% and delving into the new realm of Artificial Intelligence at 3%, blockchain at 1%

Target Sector - Information Technology & Cyber security
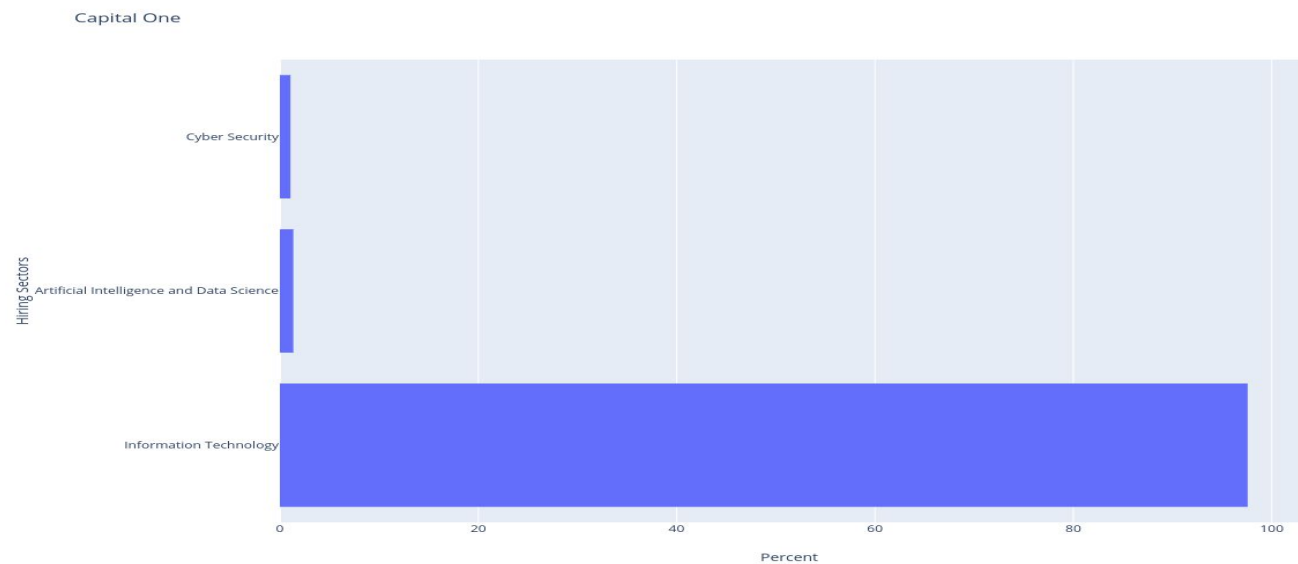
10. Bank of New York Mellon:

BNY Mellon hiring trend states that it is looking for talents in Fitech areas wherein sectors like Information Technology, Artificial Intelligence and Data Science, Blockchain, Cyber security, Big

Data are in demand as per the above data. We see IT at 86% standing as the demand sector followed by jobs in Cybersecurity at 12%

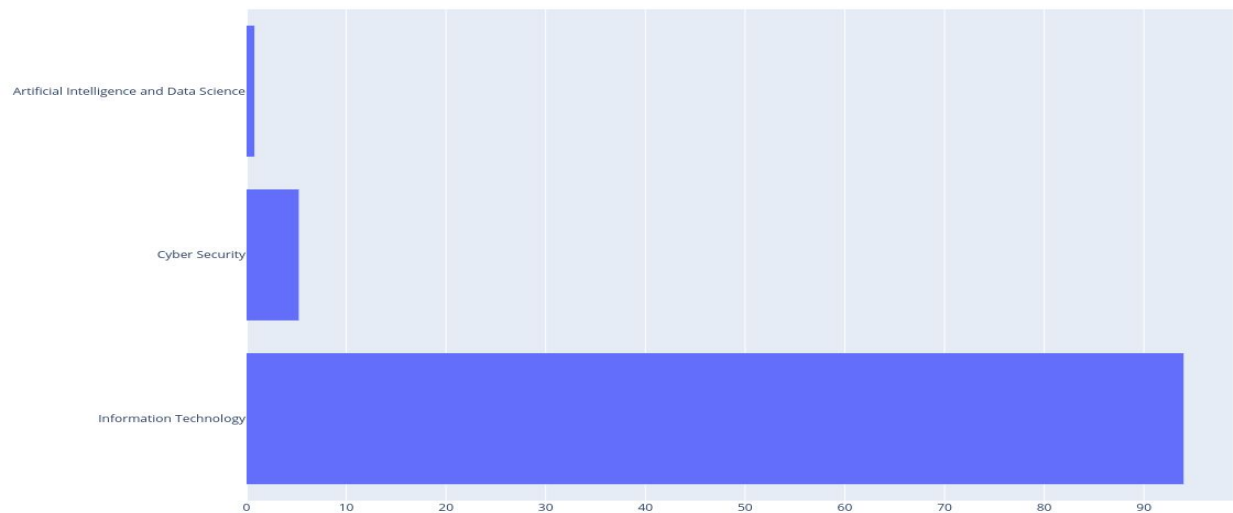*Target Sector - Information Technology & Cyber security*

11. Capital One:

Capital One hiring trend states that it is looking for talents in Fitech areas wherein sectors like Information Technology, Artificial Intelligence and Data Science, Cybersecurity are in demand as per the above data. Capital One does not seem to be looking to explore new talent in the blockchain & big data sector. We see IT at 97.5% standing as the demand sector followed by jobs in Cybersecurity at 1% and delving into the new realm of Artificial Intelligence at 1%
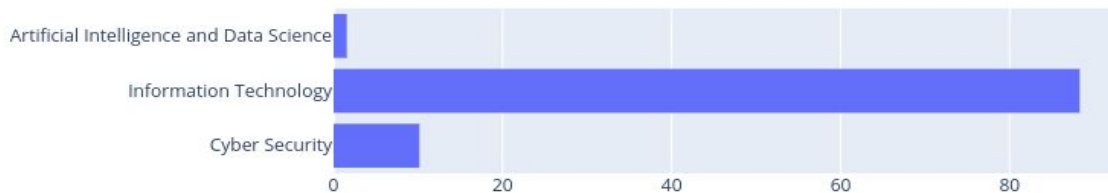
Target Sector - Information Technology

12. Charles Schwab:

Charles Schwab hiring trend states that it is looking for talents in Fitech areas wherein sectors like Information Technology, Artificial Intelligence and Data Science, Cybersecurity are in demand as per the above data. Charles Schwab does not seem to be looking to explore new talent in the blockchain & big data sector. We see IT at 94% standing as the demand sector followed by jobs in Cybersecurity at 5% and delving into the new realm of Artificial Intelligence at 0.8%

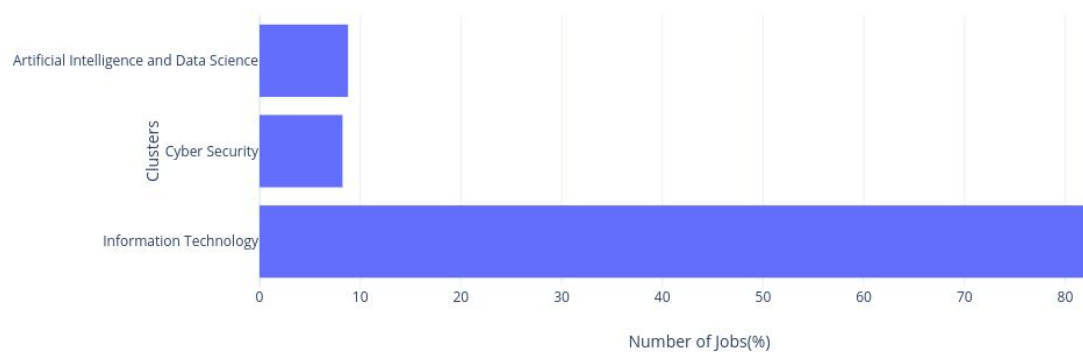*Target Sector - Information Technology*

13. BB&T Corp:

BB&T Corp hiring trend states that it is looking for talents in Fitech areas wherein sectors like Information Technology, Artificial Intelligence and Data Science, Cybersecurity are in demand

as per the above data. BB&T Corp does not seem to be looking to explore new talent in the blockchain & big data sector. We see IT at 88% standing as the demand sector followed by jobs in Cybersecurity at 10% and delving into the new realm of Artificial Intelligence at 1.5%

Target Sector - Information Technology & Cybersecurity

14. State Street:
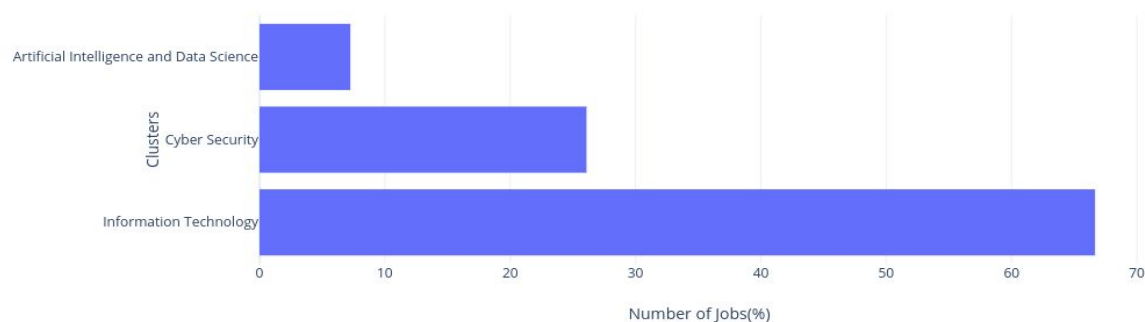
State Street Hiring Trend in FinTech:

State Street hiring trend states that it is looking for talents in Fitech areas wherein sectors like Information Technology, Artificial Intelligence and Data Science, Cybersecurity are in demand as per the above data. State Street does not seem to be looking to explore new talent in the blockchain & big data sector. We see IT at 82% standing as the demand sector followed by jobs in Cybersecurity at 8% and delving into the new realm of Artificial Intelligence at 0.5%

Target Sector - Information Technology
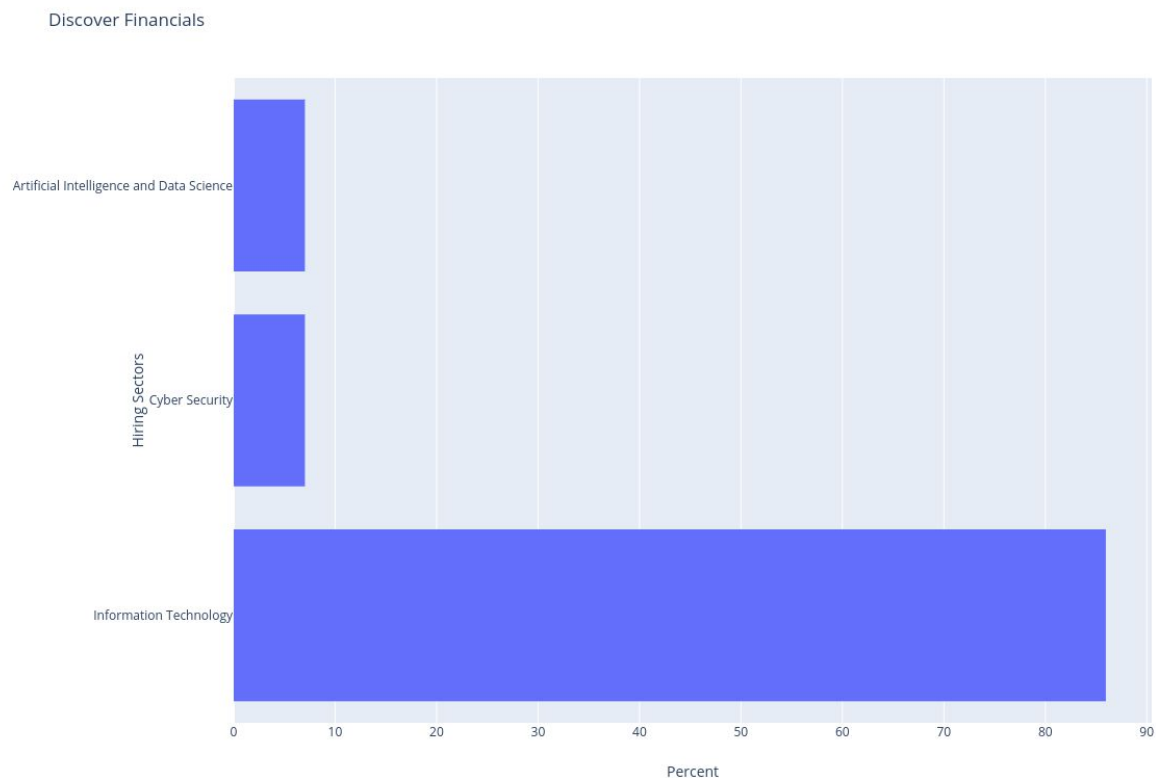
15. SunTrust Bank:

SuntTrust Hiring Trend in FIntTech:

SunTrust Bank hiring trend states that it is looking for talents in Fitech areas wherein sectors like Information Technology, Artificial Intelligence and Data Science, Cybersecurity are in demand as per the above data. SunTrust Bank does not seem to be looking to explore new talent in the blockchain & big data sector. We see IT at 67% standing as the demand sector followed by jobs in Cybersecurity at 26% and delving into the new realm of Artificial Intelligence at 7.2%
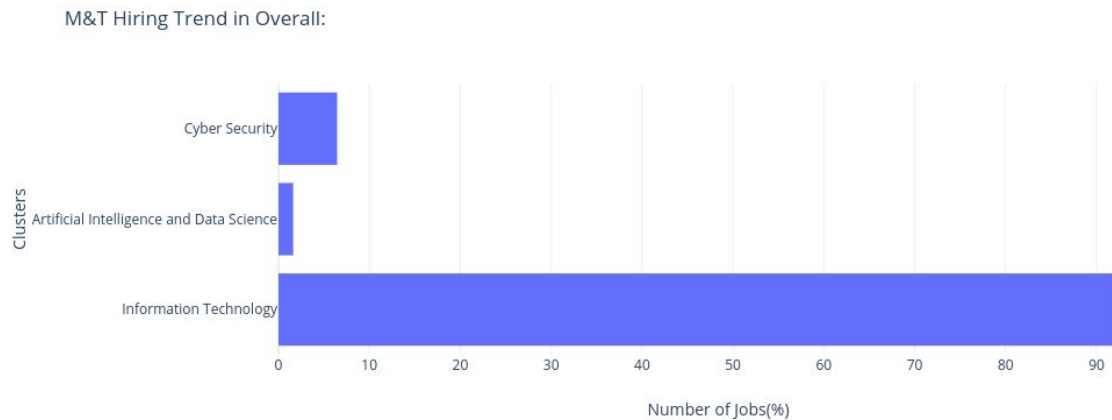
Target Sector - Information Technology & Cybersecurity

16. Discover Financial:

Discover Financials

Discover Financial hiring trend states that it is looking for talents in Fintech areas wherein sectors like Information Technology, Artificial Intelligence and Data Science, Cybersecurity are in demand as per the above data. SunTrust Bank does not seem to be looking to explore new talent in the blockchain & big data sector. We see IT at 86% standing as the demand sector followed by jobs in Cybersecurity at 7% and delving into the new realm of Artificial Intelligence at 7%.

Target Sector - Information Technology

17. M&T Bank:

M&T Hiring Trend in Overall:

M&T Bank hiring trend states that it is looking for talents in Fintech areas wherein sectors like Information Technology, Artificial Intelligence and Data Science, Cybersecurity are in demand as per the above data. M&T Bank does not seem to be looking to explore new talent in the blockchain & big data sector. We see IT at 92% standing as the demand sector followed by jobs in Cybersecurity at 7% and delving into the new realm of Artificial Intelligence at 1%.
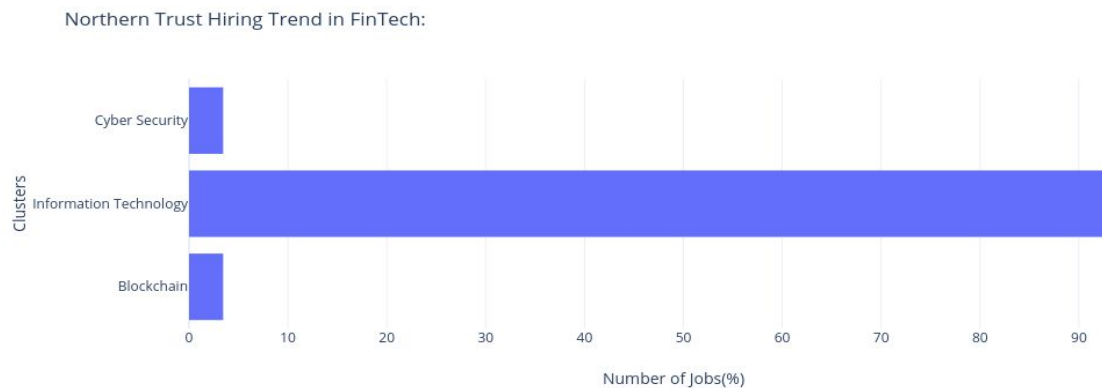
Target Sector - Information Technology

18. Northern Trust Group:

Northern Trust Hiring Trend in FinTech:

Northern Trust Group hiring trend states that it is looking for talents in Fintech areas wherein sectors like Information Technology, Cybersecurity, Blockchain are in demand as per the above data. Northern Trust Group seems to be looking to explore new talent in the Blockchain. We see IT at 93% standing as the demand sector followed by jobs in Cybersecurity at 3.5% and delving into the new realm of Blockchain at 3.5%.

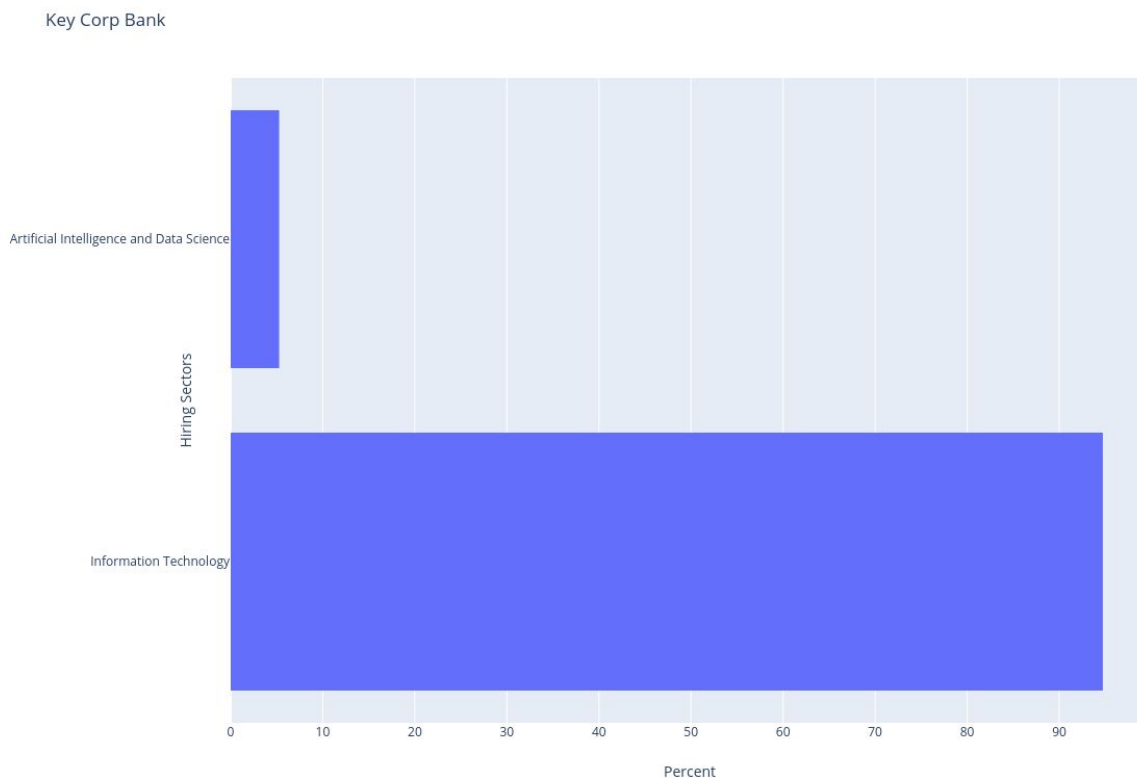*Target Sector - Information Technology*

19. Fifth Third Bank Corp:

Fifth Third Bank Corp hiring trend states that it is looking for talents in Fintech sectors only in Information Technology. Fifth Third Bank Corp does not seem to be looking to explore new talent in the blockchain, big data sector, cybersecurity or Artificial Intelligence. We see IT alone at 100% standing as the demand sector. This bank does not delve much into the Fintech world.

Target Sector - Information Technology
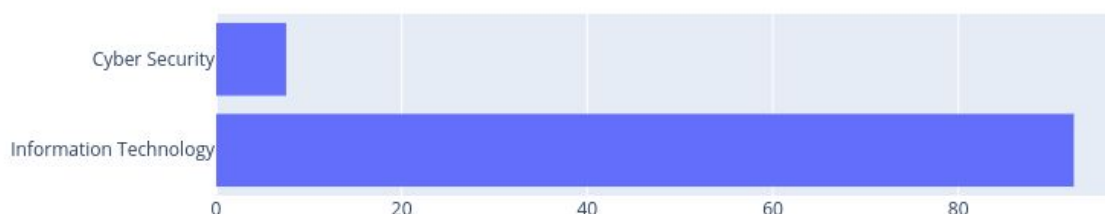
20. KeyCorp:

KeyCorp hiring trend states that it is looking for talents in Fintech areas wherein sectors like Information Technology, Artificial Intelligence and Data Science are in demand as per the above

data. KeyCorp Bank does not seem to be looking to explore new talent in the cybersecurity, blockchain & big data sector. We see IT at 95% standing as the demand sector followed by jobs Artificial Intelligence at 5%. KeyCorp seems to delve slowly into Fintech world.

Target Sector - Information Technology
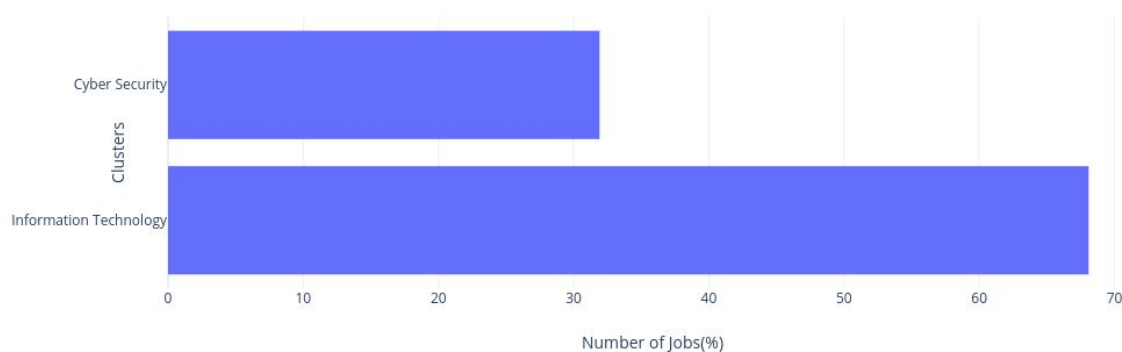
21. Citizens Financial:

Citizens Financial hiring trend states that it is looking for talents in Fintech areas wherein sectors like Information Technology, Cybersecurity are in demand as per the above data. Citizens Financial does not seem to be looking to explore new talent in the blockchain & big data sector. We see IT at 92% standing as the demand sector followed by jobs in Cybersecurity at 7.5%

Target Sector - Information Technology
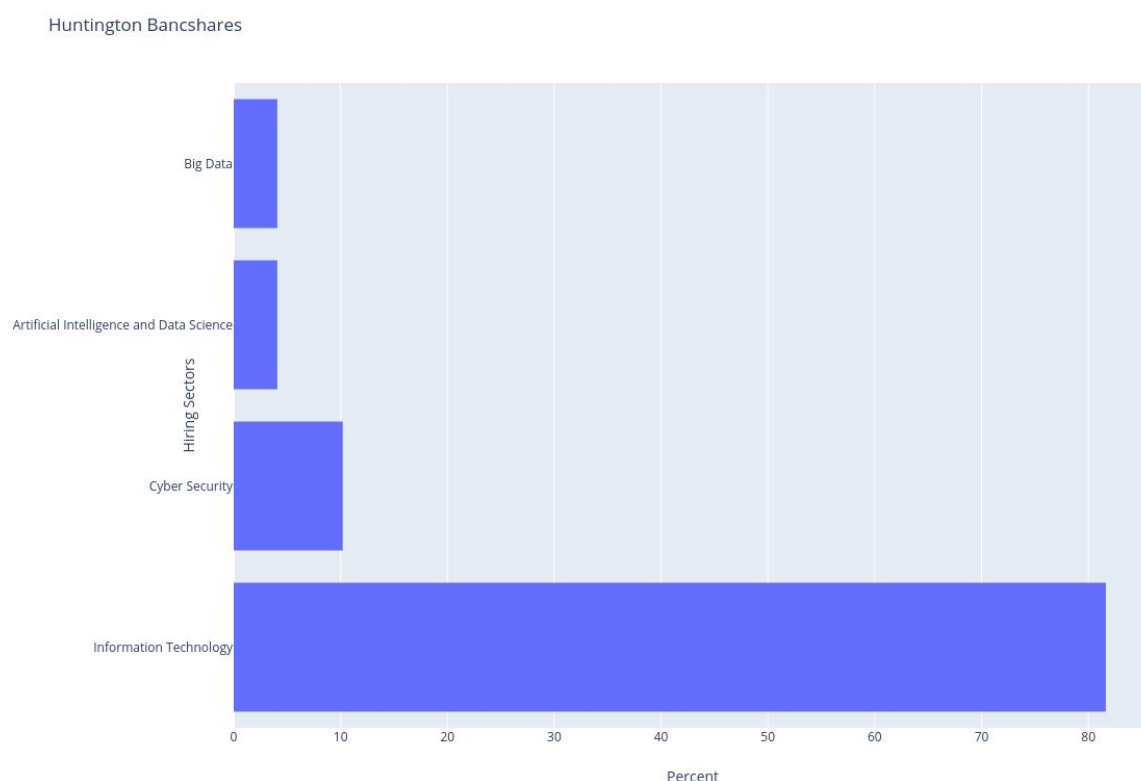
22. Regions Finacial:

Regions Financial hiring trend states that it is looking for talents in Fintech areas wherein sectors like Information Technology, Cybersecurity are in demand as per the above data.

Regions Financial does not seem to be looking to explore new talent in the blockchain & big data sector. We see IT at 68% standing as the demand sector followed by jobs in Cybersecurity at 32%

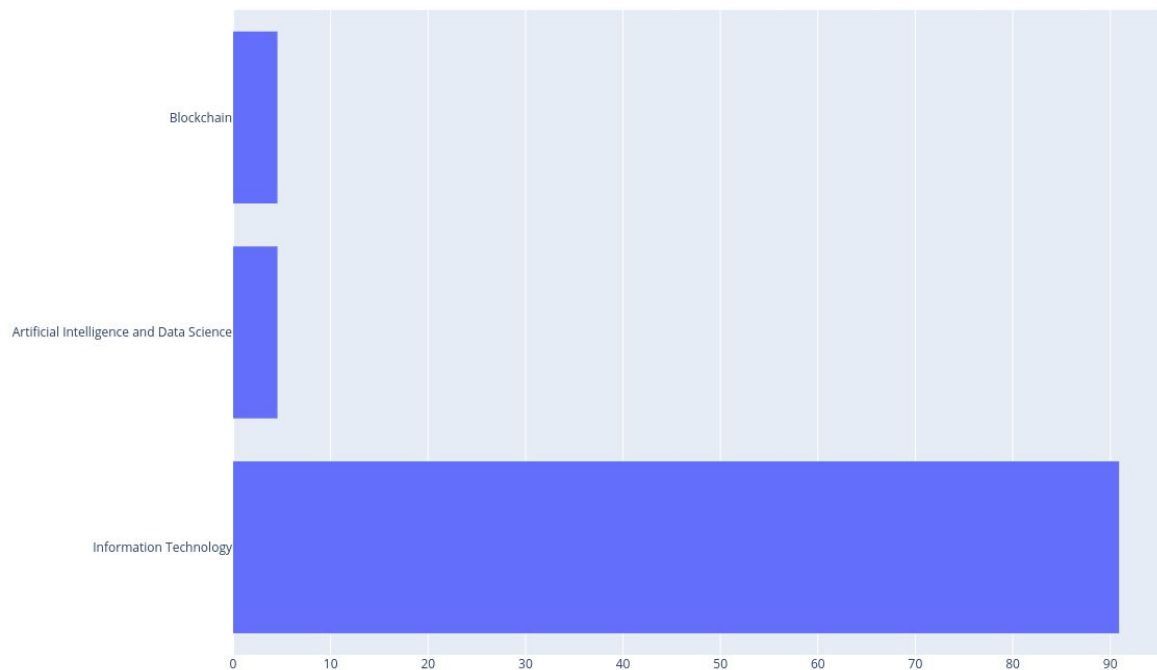*Target Sector - Information Technology*

23. Huntington Bancshares:

Huntington Bancshares

Huntington Bancshares hiring trend states that it is looking for talents in Fintech areas wherein sectors like Information Technology, Artificial Intelligence and Data Science, Cybersecurity and Big Data are in demand as per the above data. Huntington Bancshares does not seem to be looking to explore new talent in the blockchain sector. We see IT at 81% standing as the demand sector followed by jobs in Cybersecurity at 10% and delving into the new realm of Artificial Intelligence at 4% along with Big Data at 4%.

Target Sector - Information Technology & Cybersecurity
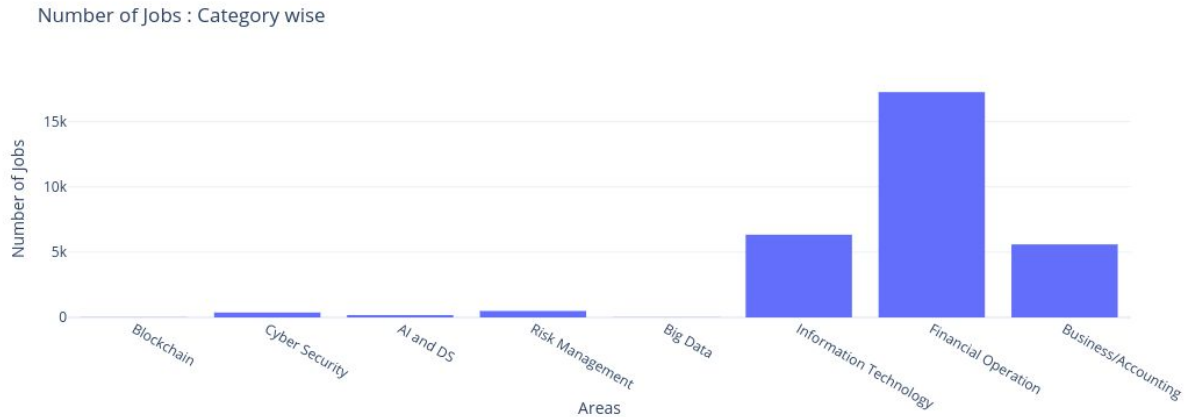
24. Comerica Inc.:

Comerica Inc hiring trend states that it is looking for talents in Fintech areas wherein sectors like Information Technology, Artificial Intelligence and Data Science, Blockchain are in demand as per the above data.Comerica Inc does not seem to be looking to explore new talent in the cybersecurity & big data sector. We see IT at 90% standing as the demand sector followed by jobs in blockchain at 4.5% and delving into the new realm of Artificial Intelligence at 4.5%.
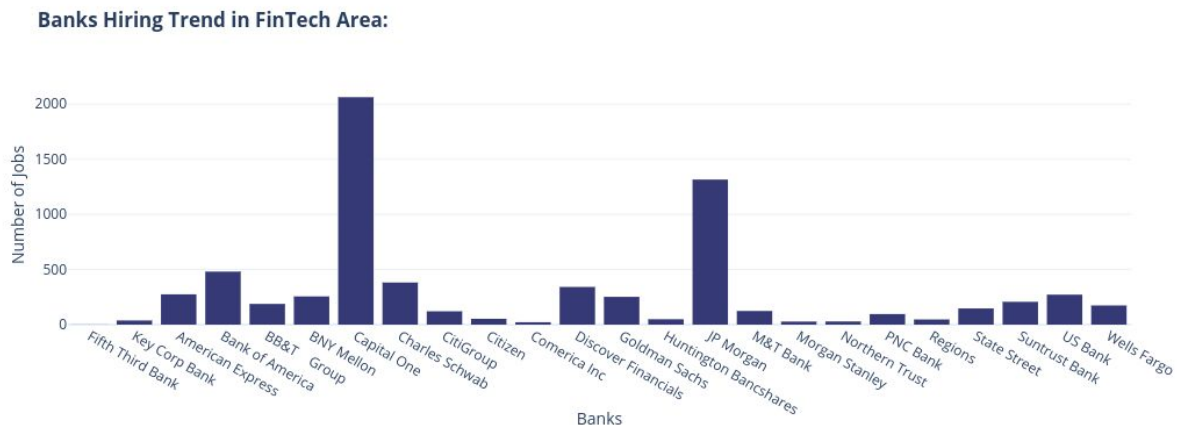
Target Sector - Information Technology

Thus from all the above data it can be inferred that in the 24 banks, majority have delved into the fintech sector whereas a few are newbies to this arena. The hiring trend seems to be inclined towards people proficient in skills pertaining to the IT sector and Cybersecurity sector following in a close or decent second.

2. How are the fintech related job hiring trends?
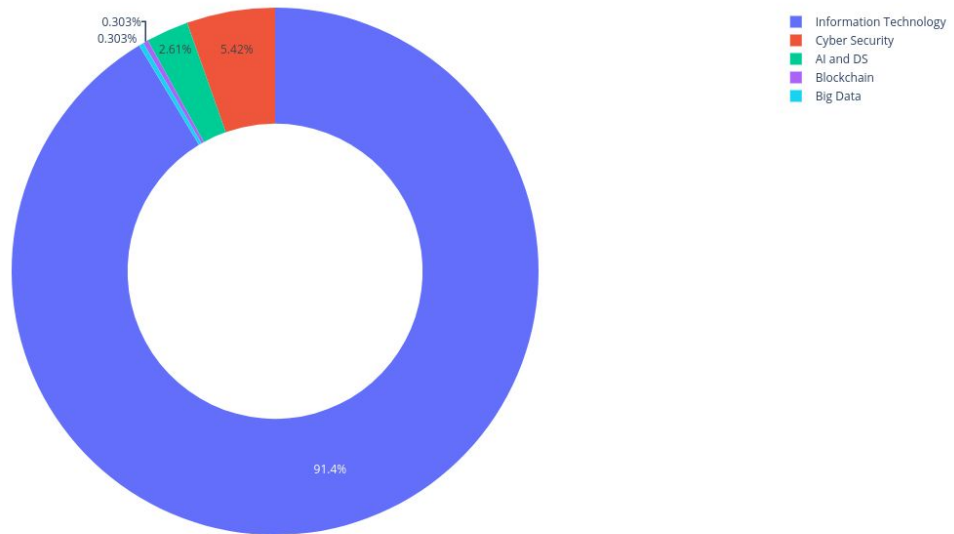

Number of Jobs : Category wise

The fintech related job hiring trends as demonstrated by the graph above states that the Financial Operation is the most in demand sector following being Information Technology and a close third being Business & accounting. We can see that many have also delved into cybersecurity as the demand for mobile based application is higher compared to web based application. Risk Management also seems to be slowly catching up followed by Artificial Intelligence & Data Science the new trend in the market.

3. Which companies have the most fintech related jobs and which ones least?

Banks Hiring Trend in FinTech Area:

After analysing all the 24 banks for their hiring trends in fintech it can be gathered that the bank leading in this area with majority opening in fintech sectors is Capital One followed by JP Morgan. These banks have accepted the latest trends in the market and taken up broadening their horizons into the fintech world. The bank that has just started or are very late to the game are Fifth Third Bank & Comerica Inc.

4. Rank the jobs in fintech categories. Which categories have the most jobs and which ones least?

The jobs in fintech categories are -
1. Information Technology
2. Cyber Security
3. Artificial Intelligence & Data Science
4. Blockchain
5. Big Data

Thus it can be inferred that the most jobs are in the Information Technology sector and least in Big Data.

5. If you have a job seeker, which areas would you recommend the job seeker to focus on based on available jobs?

We would recommend the job seeker to focus on the sectors of Information Technology, Finance, Cybersecurity, Artificial Intelligence & Data Science as these are all the booming sectors as per the data gathered to find the hiring trends in the fintech world.

Inference:

Thus it can be inferred that the hiring trends in the fintech sector for the top 24 banks in the United States is majorly concentrated in Information Technology, followed by CyberSecurity, Artificial Intelligence & Data Science and slowly expanding into blockchain & big data.

Languages and Tools:

We have used Python language to build a program and used python package to carry out the case study

We have used Pandas for Data Reading and Manipulation.

Each program file has a description of the packages we used in the comment section.

Github Directory:

Citations:

https://www.kaggle.com/learn/pandas
https://www.youtube.com/watch?v=xvpNA7bC8cs&t=690s
https://www.datacamp.com/community/tutorials/wordcloud-python
http://flask.pocoo.org/
https://plot.ly/online-chart-maker/
https://github.com/wsargent/docker-cheat-sheet
http://docs.dask.org/en/latest/

Questions:

For any questions and help you can reach out to us to below mentioned Email ID:

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Veena Iyer: iyer.v@husky.neu.edu