Fintech Hiring Trends in Citizens and Regions Bank

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Overview

What is the 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 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 case study is to conduct an analysis on the hiring trends in the top Banks in the United States and analyze trends in the industry particularly in the area of Fintech.

Methodology

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

Module 1: Extracting the top terms in FinTech Industries

Module 2: Parse each job posting and do keyword extraction from the Bank's website.

Module 3: Analyze the data and draw insights on hiring patterns and trends.

Module 1

Extracting the top terms in FinTech Industries

We have extracted keywords that are frequently used in Fintech Industries and for that, we have referred to The World Economic Forum (WEF), which has put together research in the area and it is summarized in 4 reports.

1.http://www3.weforum.org/docs/Beyond_Fintech_-_A_Pragmatic_Assessment_of_Disruptive_Potential_in_Financial_Services.pdf

2. http://www3.weforum.org/docs/WEF_The_future__of_financial_services.pdf

3. http://www3.weforum.org/docs/WEF_The_future_of_financial_infrastructure.pdf

4. http://www3.weforum.org/docs/WEF_A_Blueprint_for_Digital_Identity.pdf

These four reports comprehensively discuss the state of the industry and the upcoming trends.

To find the top words from the reports we have used below text ranking algorithms

- WordCount
- TFIDF
- TextRank

After extracting the tops most words using each algorithm we have created a list of top 100 words that we will use in Module 2.

The word list we obtained from each algorithm will be found under the following directory:

DS_Assignment1/ Data/ Part 1

Module 2

Parsing each job posting and extract keyword from the Bank's website.

In this module, we have used below 2 Bank's website and scrape the jobs related to the Technical domain.

Bank :

1. Citizens: https://jobs.citizensbank.com/
2. Regions: https://regions.wd5.myworkdayjobs.com/Regions_Careers

We build a web scraper which goes through each bank website and filters out the jobs related to the technical area. After getting filtering all the jobs we get the List of URLs and we parse through each URL and compare the words that we have extracted form Module 1 with the job description.

We have used all three algorithms extracted words for each bank. So we can compare the variations between algorithms.

After going through each URL from each bank, we build a report in the below format which we are going to use in Module 3.

Final Report Format:

Job no	Institution	List id (1,2,3)	URL (URL Of job posting)	List id (1,2,3)	1	2	.....	99	100
	J P Morgan	1	https://jobs.jpmorganchase.com/ShowJob/Id/191925/Python-Software-Engineer-Digital-Investment-Bank/	1	0	5		1	4

Module 3

Analyze the data and draw insights on hiring patterns and trends.

After building a final report, we have used the DataWrapper tool to visualize the data using the report we build in module 1 and 2.

From the visualization aspect, we tried to answer the following questions:

1. Key areas of fintech that were inferred from the lists you created in Part 1.
2. Key hiring trends that are drawn from Part 1 and 2.

We will discuss briefly about our insights in the next module that found after doing above step.

Observations

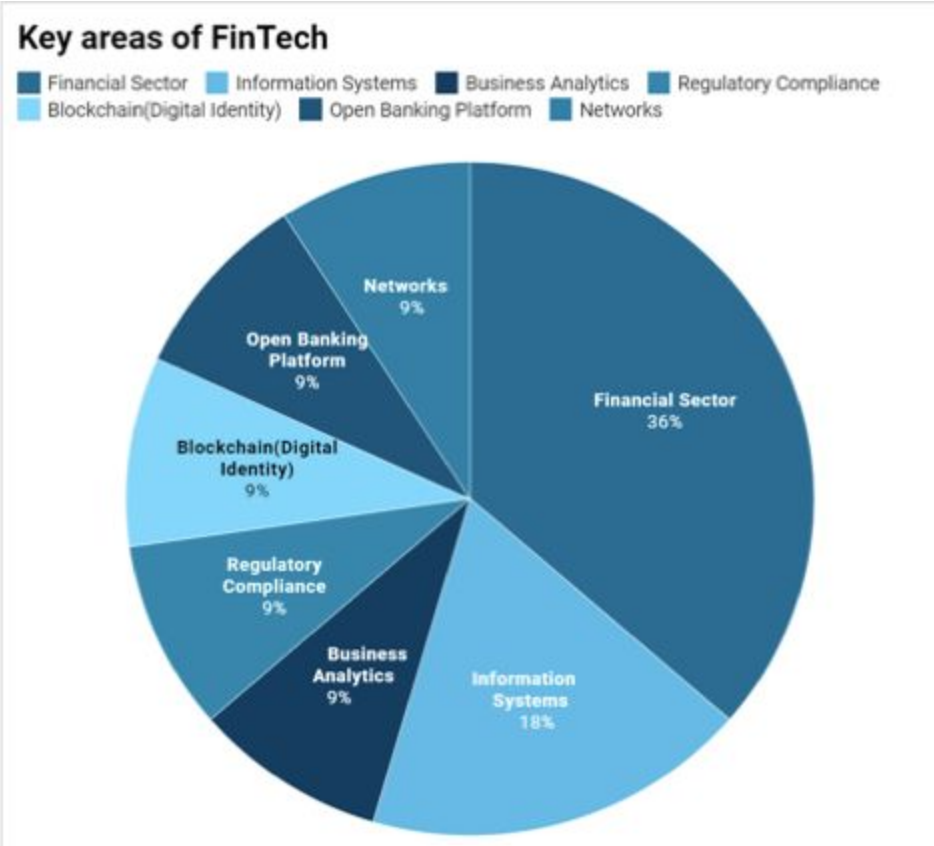
Key areas of fintech inferred from top 300 keywords

To understand the keywords that are typically used in fintech we have gone through World Economic Forum's research reports. We extracted top 300 keywords from these reports by using three approaches, i.e. 100 from each approach

a. Wordcount

b. TF/IDF

c. Text Rank



We took common words that we have found in three approaches to analyze key areas in fintech.

From the data and observations, we conclude that keywords related to financial sectors were more. Financial sector keywords include payments, financial systems, account reconciliation, loan, asset managers etc.

Considering the fact that Information systems help to control the performance of business process, we found Information Systems as 2nd most common keyword.

The most popular domain of blockchain use is banking sector because security is of utmost importance for financial domain. We have found 9% of the common keywords related to the blockchain. In which the most common one was Digital Identity.

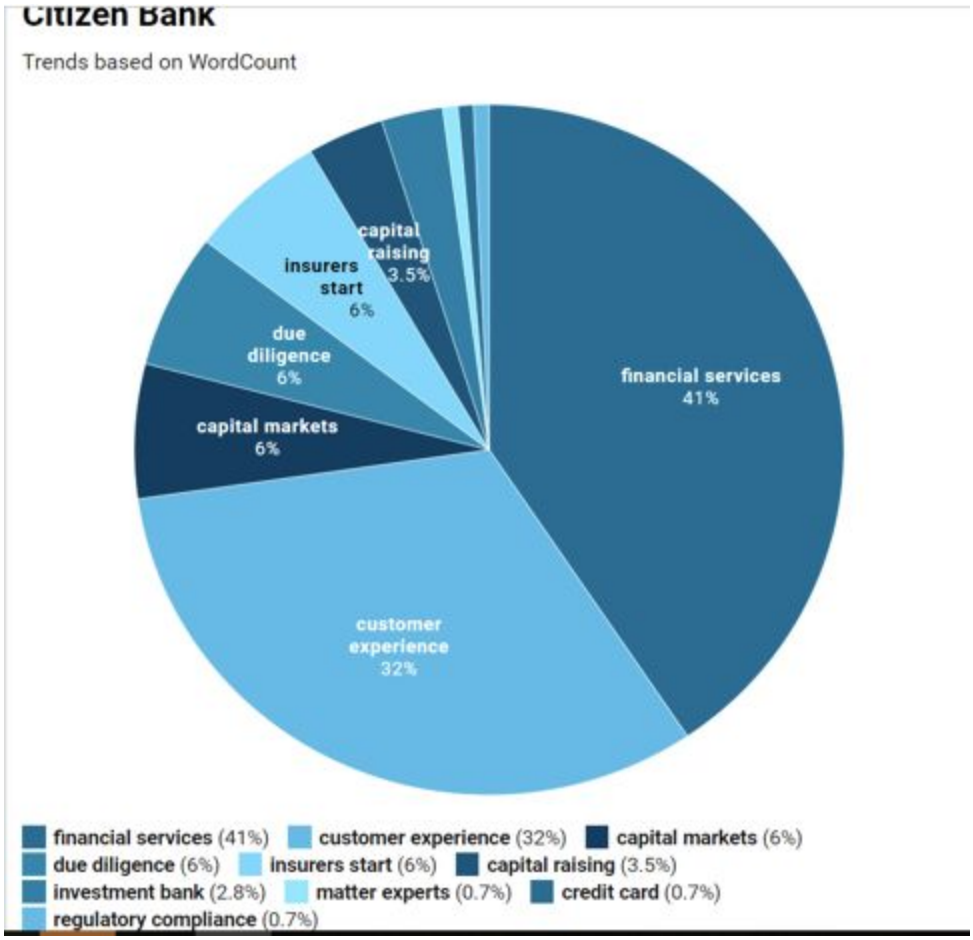
Though in today's world there are very fewer banks using open banking platforms. But our analysis shows it as one of the major key areas in fintech. There are possibilities that this approach may get popular in future and could transform the way we use and move money.

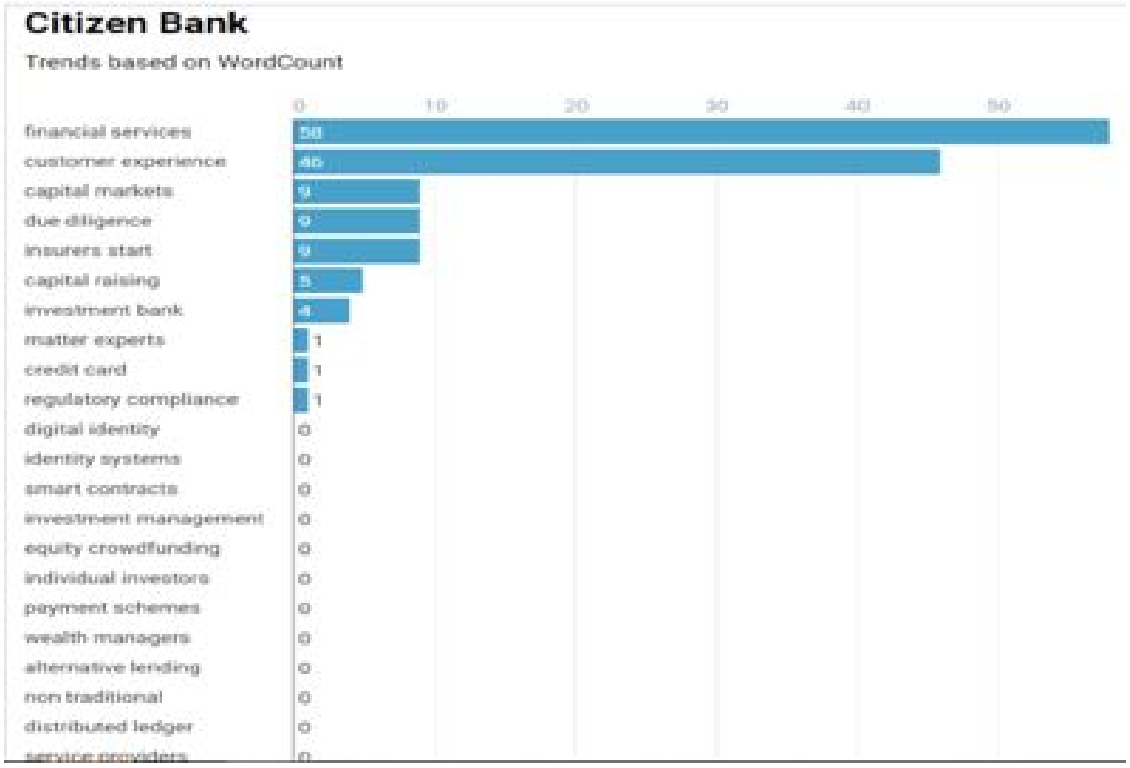
Business analytics is also one of the key areas as it gives different views of company's financial data. Which has impact on all parts of business.

Regulatory compliance plays major role in every organization. No doubt it is one of the key areas of fintech with 9% keyword match.

Key hiring trends in fintech

a. Wordcount approach (Citizen's Bank):

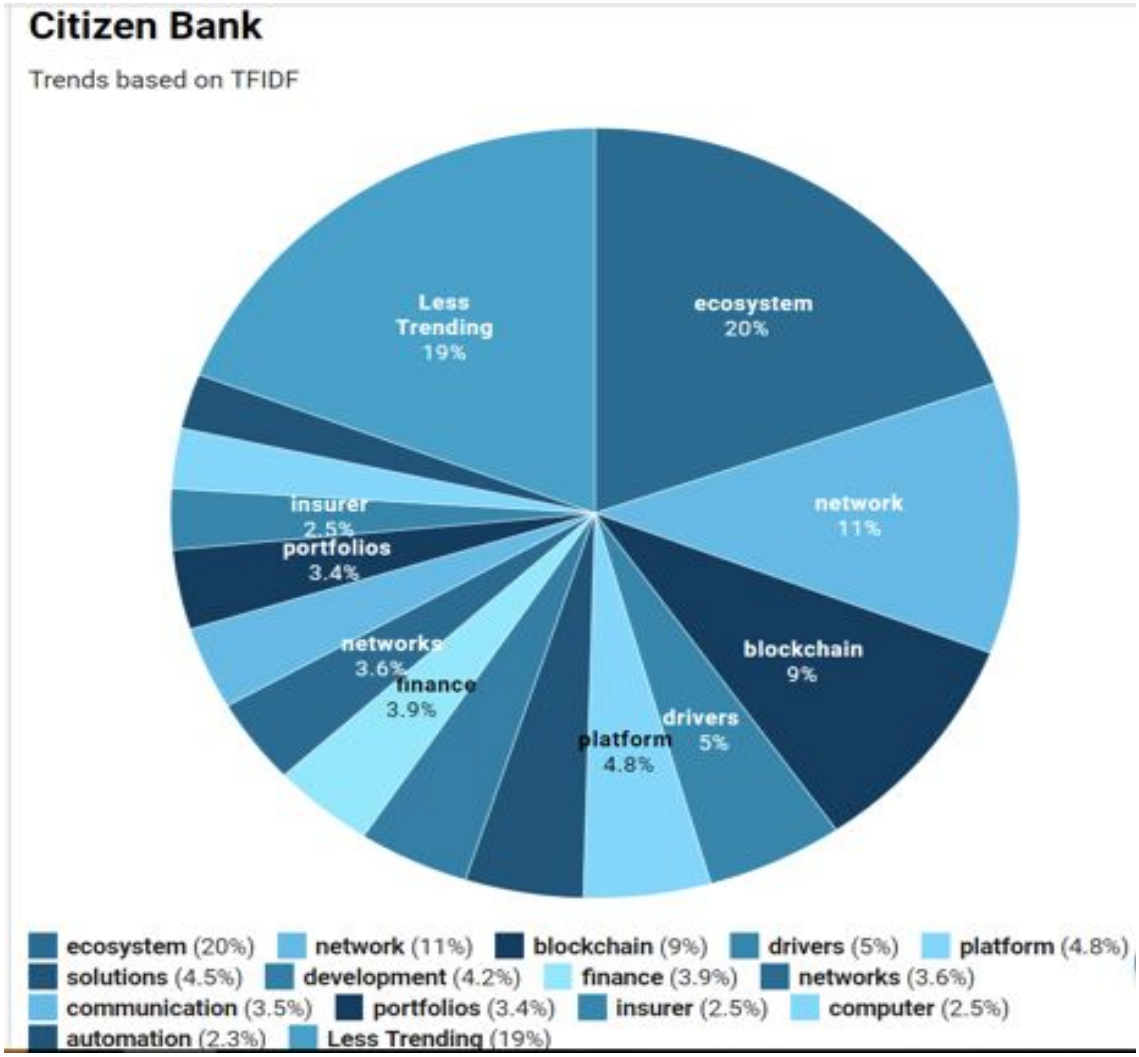


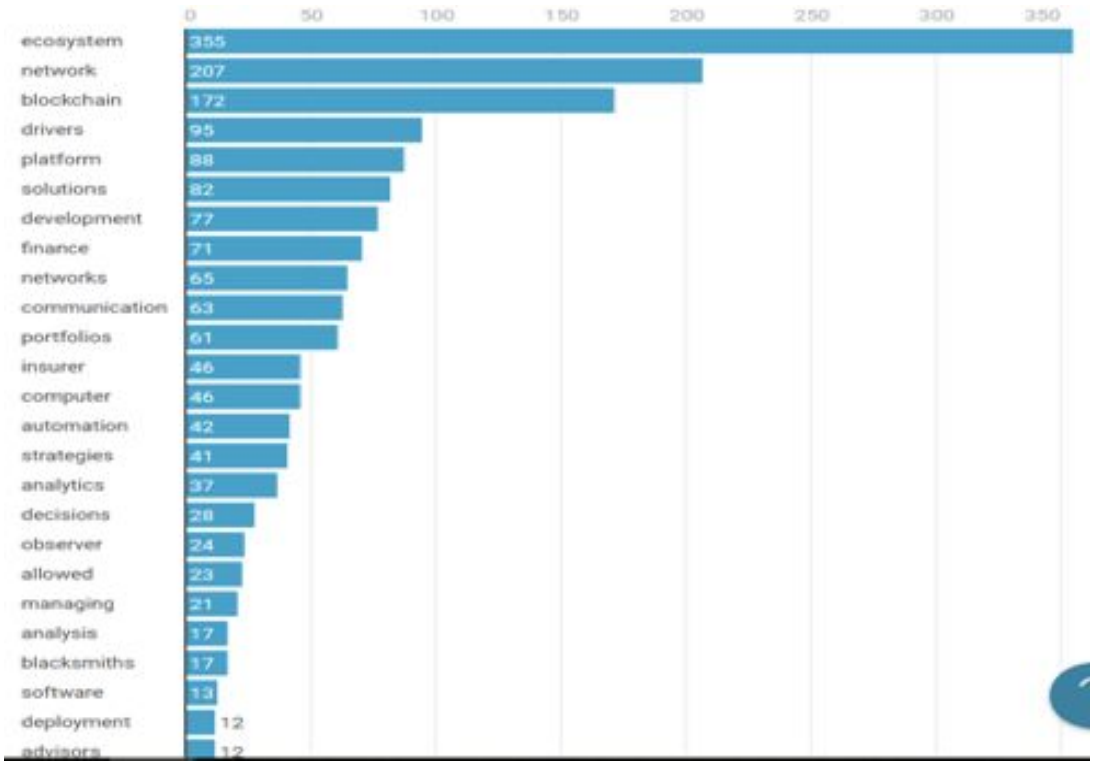


The bigrams that we have found from Wordcount approach gave us financial services as most hiring trend in citizen's bank. Financial Services includes wide variety of careers such as financial analyst, financial advisor, financial manager.

Customer experiences, capital raising, investment bank shows that fintech are showing more inclination towards hiring financial sector experts.

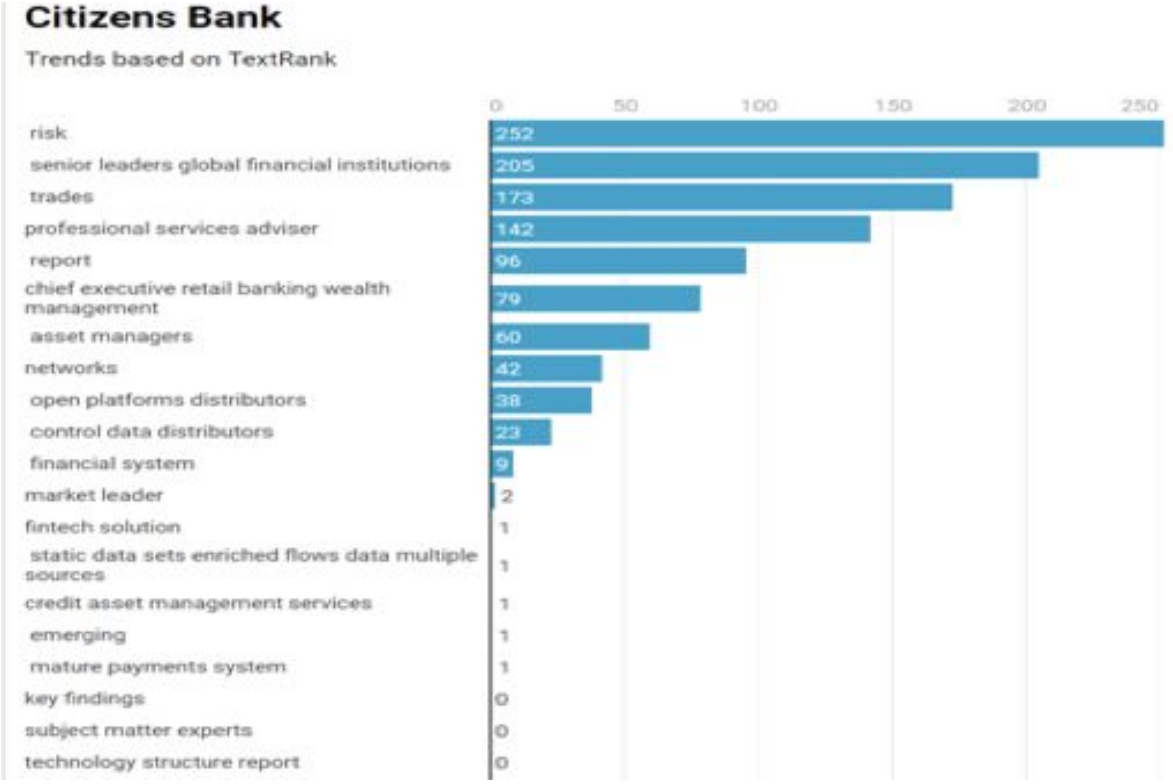
b. TF/IDF approach (Citizen's Bank):





With TF/IDF approach we observed that though there are more occurrences of word **ecosystem**, top hiring trends in above chart includes more technical keywords. The words like development, automation, analytics, blockchain, deployment, software shows that citizen bank is hiring more technical experts than any other sectors.

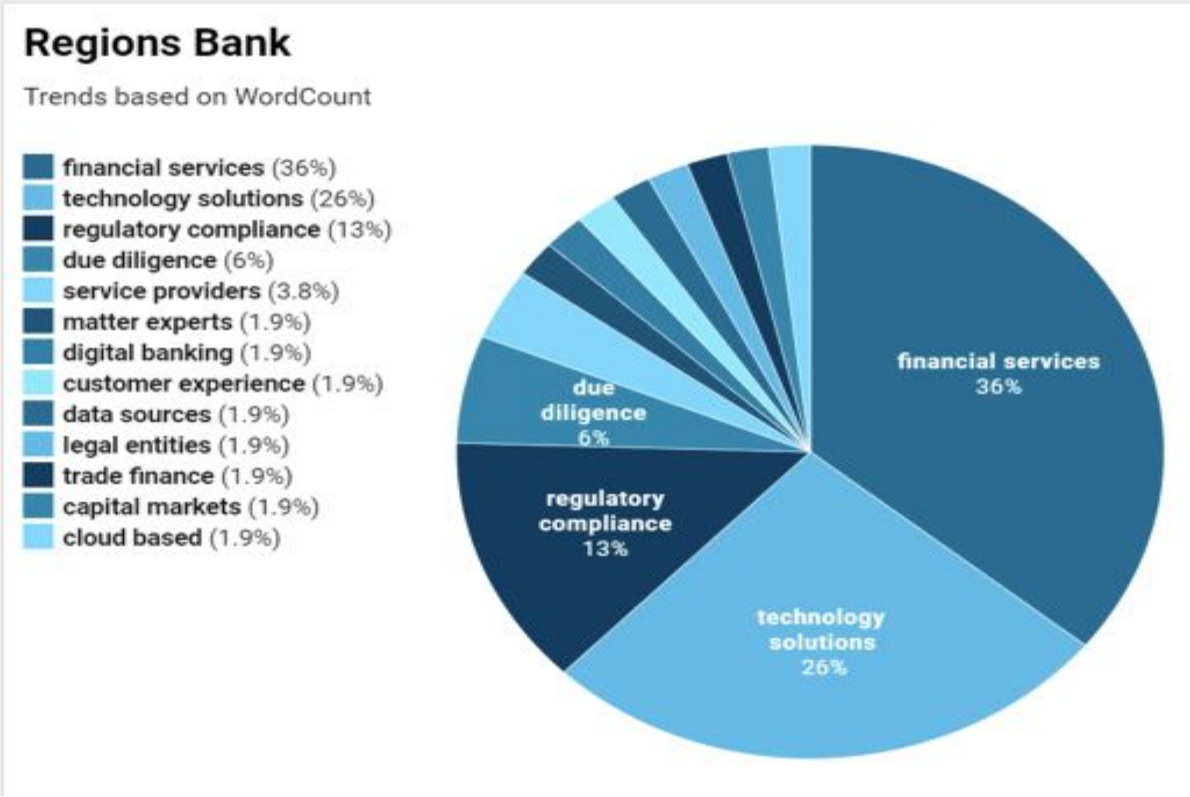
c. Text Rank approach (Citizen's Bank):

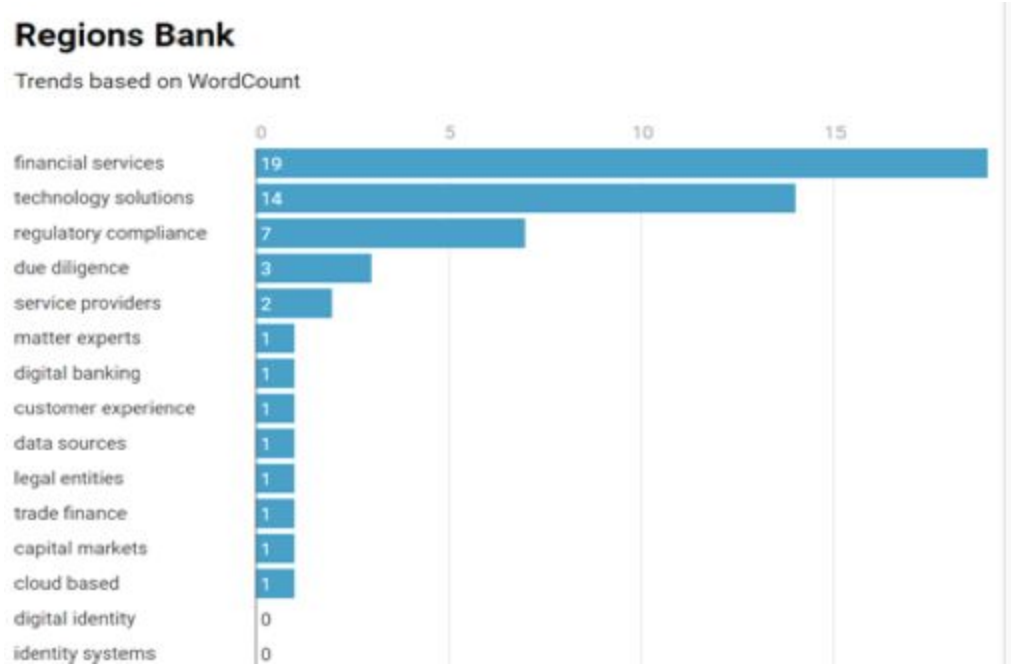


We have taken the highest rank n-grams by using Text Rank approach. We observed that the keywords and the sentences that were ranked top in hiring trends are related to finance sectors.

Which concludes that citizen bank is hiring more financial service experts.

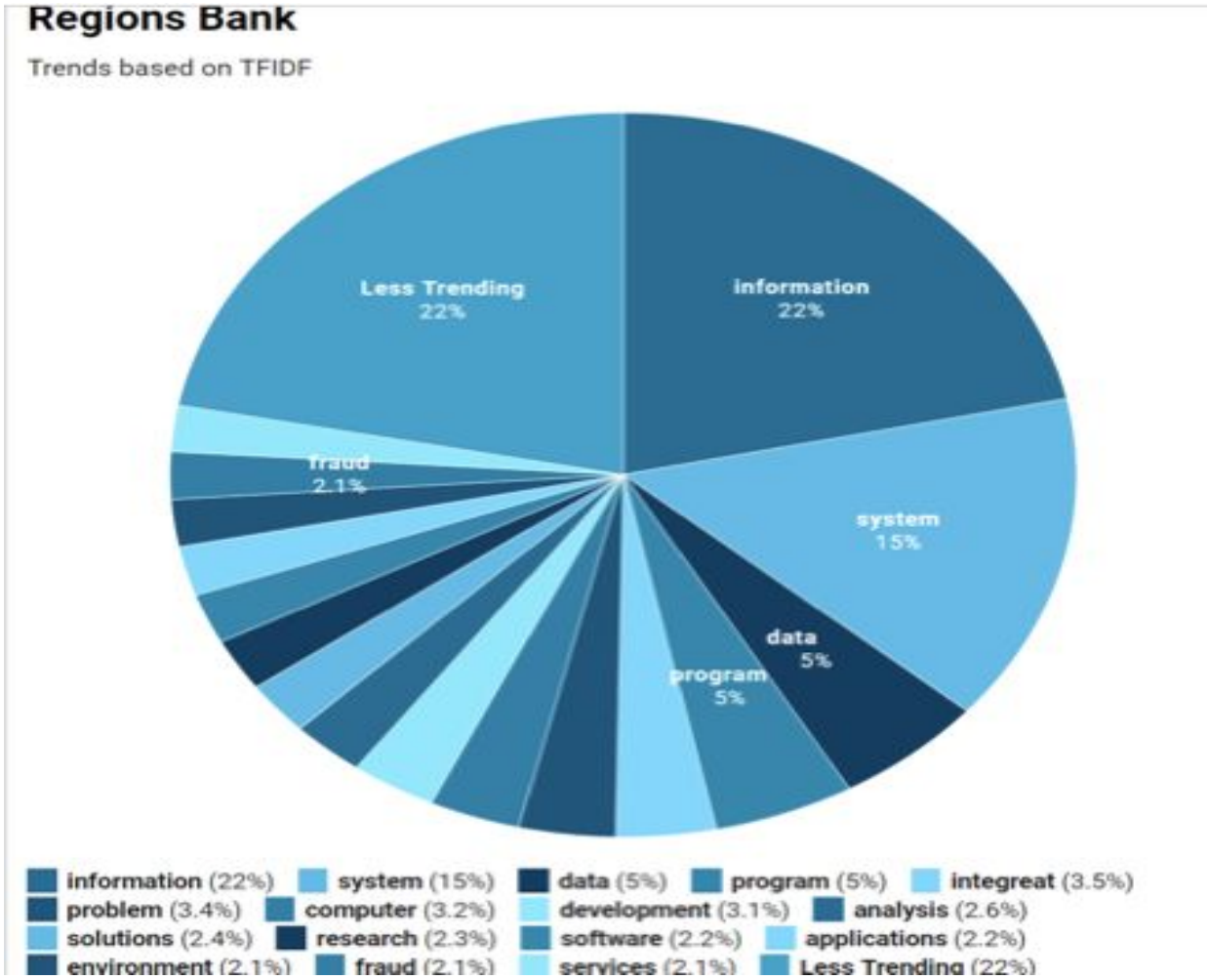
d. Wordcount approach (Region's Bank)

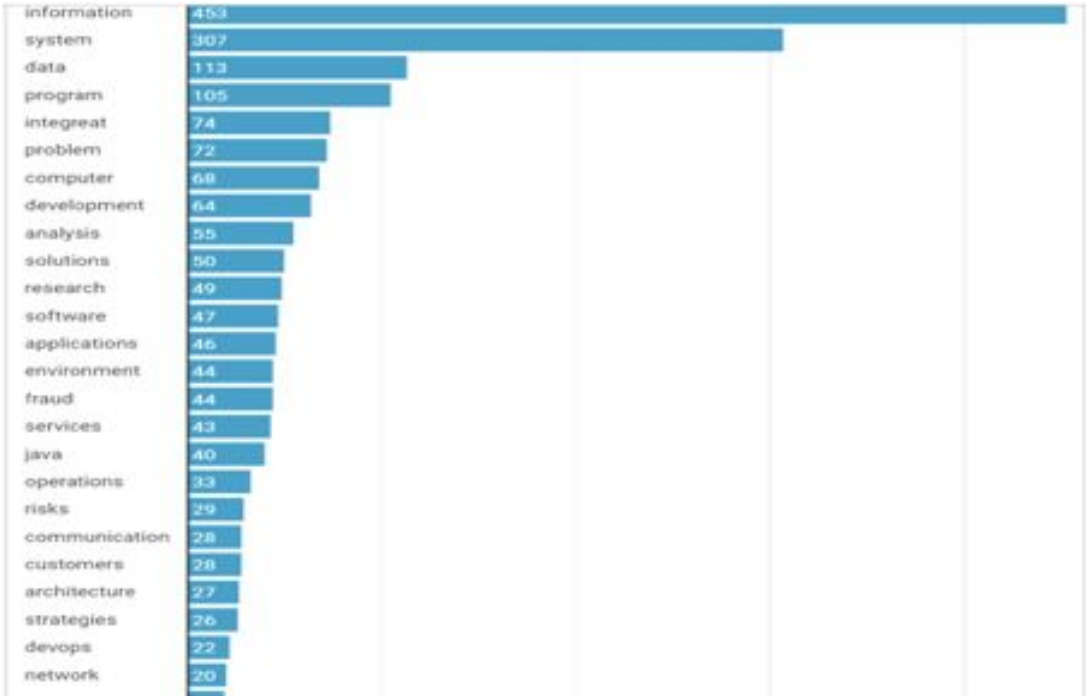




The bigrams that we have found in hiring lists of Region Bank are showing similar keywords like Citizen's Bank. This shows that the Region Bank is also hiring financial domain people.

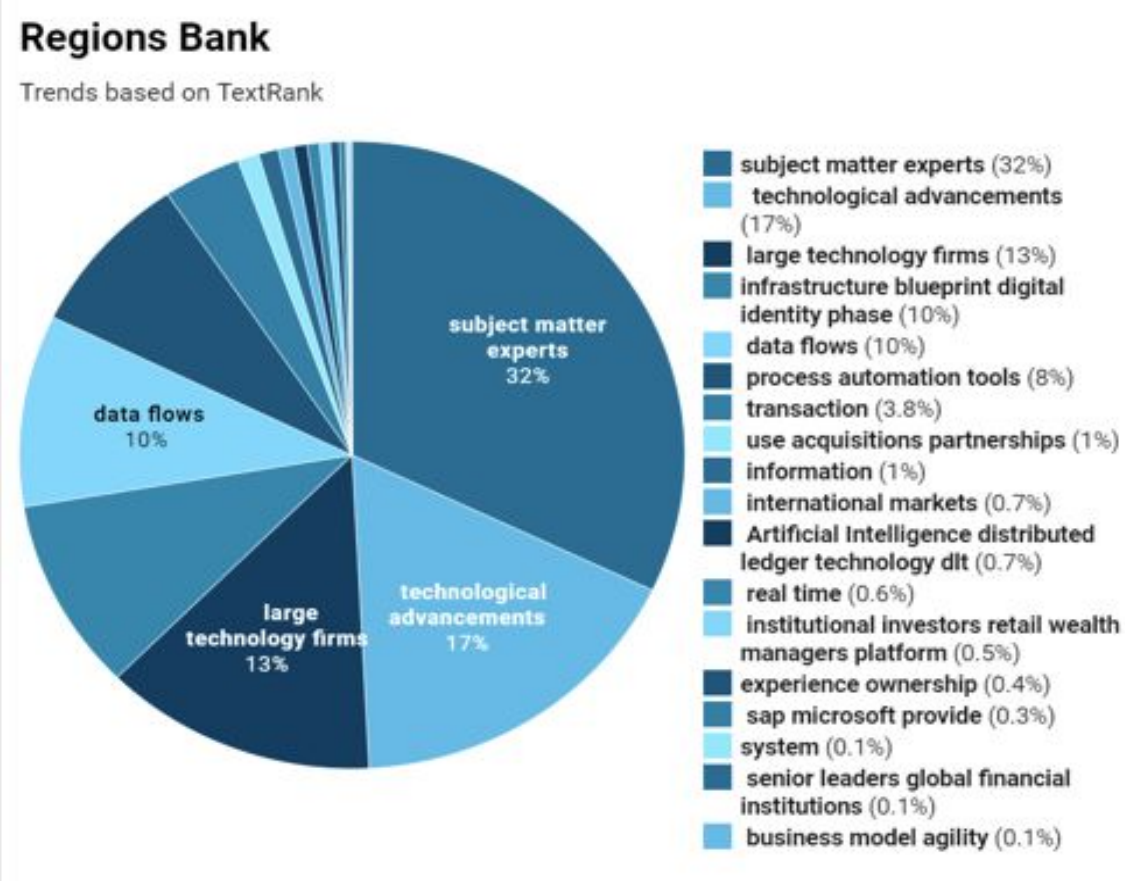
e. **TF/IDF approach (Region's Bank)**

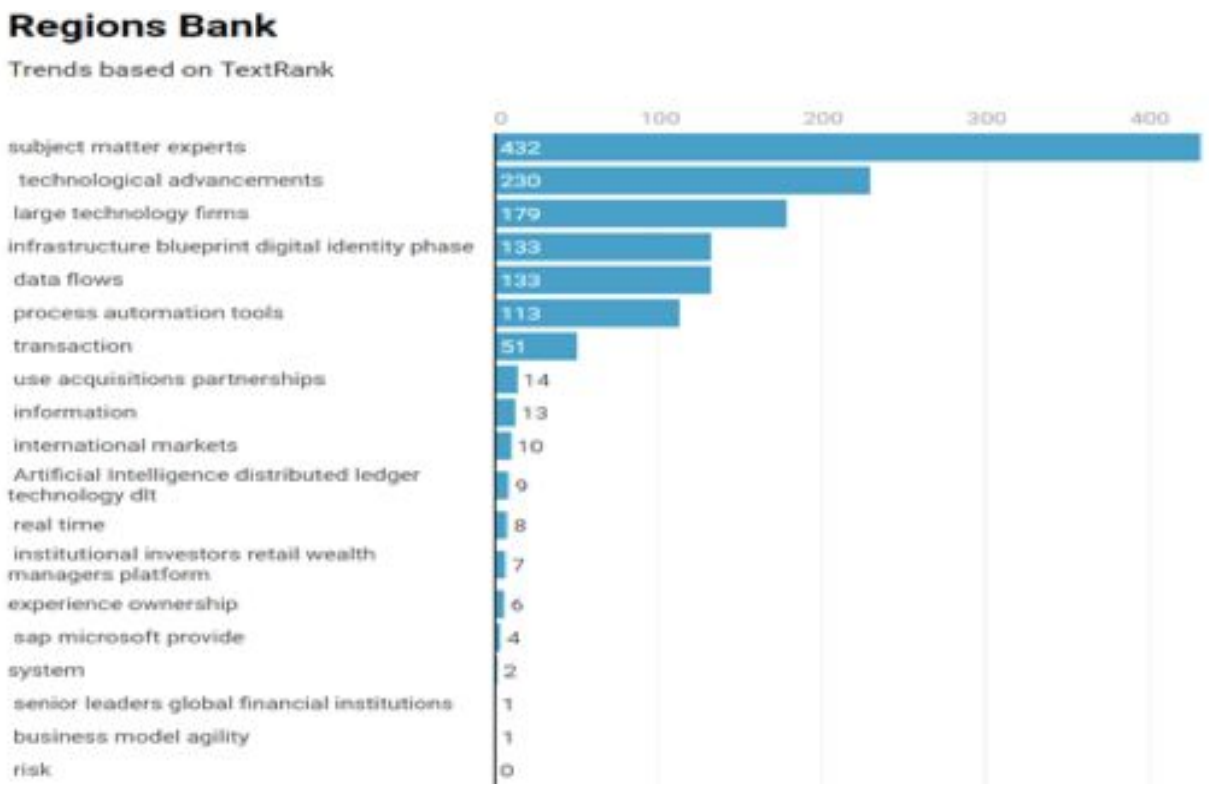




Unlike wordcount, in TF/IDF approach we found both technical and financial job-related keywords which shows that region's bank is hiring both technical and financial experts.

f. Text Rank approach (Region's Bank)





By observing top n-grams found by using Text rank, we can see that it is including both keywords related to technology and finance.

One thing we have observed that it has included the n-grams related to data and artificial intelligence which is in trend technology.

Inference:

Based on the above observations we can state that the banking sector is currently concentrated on the hiring people with prolific knowledge in Finance and Technology and is also adopting new technologies like artificial intelligence, data science, and automation to enable the smooth functioning of the banking sectors.

Language and Tools

We have used Python language to build a program and used python packages to carried out the case study.

We have used selenium and ChromeDriver tool to build the scrapper.

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

Github Directory: https://github.com/DS2019Spring/DS_Assignment1

Citations

https://www.geeksforgeeks.org/workingwith-pdf-files-in-python/

https://github.com/JRC1995/TextRank-Keyword-Extraction

https://summanlp.github.io/textrank/

https://github.com/amrrs/Scraper-Projects

https://www.datawrapper.de

https://medium.freecodecamp.org/how-to-scrape-websites-with-python-and-beautifulsoup-5946935d93fe

https://pypi.org/project/beautifulsoup4/

https://medium.com/@justinboylantoomey/fast-text-extraction-with-python-and-tika-41ac34b0fe6

https://machinelearningmastery.com/clean-text-machine-learning-python/

https://gis.stackexchange.com/questions/72458/exporting-list-of-values-into-csv-or-txt-file-using-arcpy

https://towardsdatascience.com/tfidf-for-piece-of-text-in-python-43feccaa74f8

https://gis.stackexchange.com/questions/72458/exporting-list-of-values-into-csv-or-txt-file-using-arcpy

https://www.tutorialspoint.com/How-to-save-a-Python-Dictionary-to-CSV-file

https://machinelearningmastery.com/clean-text-machine-learning-python/

https://www.udemy.com/web-scraper/

https://youtu.be/XQgXKtPSzUI

https://youtu.be/w36-U-ccajM

https://youtu.be/FLZvOKSCkxY

https://www.lynda.com/Flask-tutorials/Learning-Flask/521231-2.html?srchtrk=index%3a1%0alinktypeid%3a2%0aq%3aflask%0apage%3a2%0as%3arelevance%0asa%3atrue%0aproducttypeid%3a2

https://github.com/docker/labs/blob/master/beginner/chapters/setup.md

Questions

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

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