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ANALYSIS OF IMMIGRATION TRENDS IN THE U.S. TO DISCOVER PATTERNS AND MAKE BETTER POLICY DECISIONS

Amita Tandon

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A Project

Presented to the

Faculty of

California State University,

San Bernardino

In Partial Fulfillment

of the Requirements for the Degree

Master of Science

in

Information Systems and Technology

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ABSTRACT

Immigration is one of the most hotly debated topics in the US. Merely taking a look at the types of immigrant and non-immigrant visas issued by the US government, one can realize the complexity of the law governing the numerous intricacies involved with the issue of immigration (Golash-Boza, 2009). With the ever-increasing population of immigrants in the US, a good understanding of immigration's impact on the US society is more important than ever before. The objective of this project was to increase our understanding of immigration's impact on the US society by investigating the general trends in Visa Applications, employers, cities, economic factors and highlighting the important observations. The important findings are: (a) The number of applications have increased, while the number of denials seem to taper off. (b) The most non-immigrant visa applications are filed by employers in a few major cities, most of them being IT companies. (c) Advanced manufacturing is one of the major sectors requiring the workforce from other countries besides IT, which takes up more than 45% of the application share. (d) H-1B visas are a clear outlier among the total non-immigrant visa applications. (e) Similarly, California is an outlier state among all the US Perm applications. (f) The immigrant workforce earns less than the natives when they enter the country. However, their salary grew gradually, and they actually end up earning significantly higher. (g) The recent immigrants tend to be more educated when compared to US-born and

total immigrants. The conclusion of the study is that immigration overall is beneficial to the American society from economic as well as cultural aspects and makes America an attractive destination for talented, highly skilled individuals. Future work should focus on keeping this analysis up to date with the latest data and potentially making this analysis available in the form of a website. Machine learning can also be used to find patterns that are not easily recognized by means of this study.

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CHAPTER ONE

INTRODUCTION

Over 14% of the United States residents are foreign-born, and half of them are naturalized citizens (United Nations, 2021). Since 1970, the share of immigrants has increased at a high rate, owing to the influx of immigrants from Latin America and Asia. In 2019, the total number of immigrants who live in the United States breached a new high. (Connor Cohn and Gonzalez-Barrera, 2015)

Historically, America has been a nation of immigrants. Earliest documented evidence of people coming into the US is during the 17th century when 400,000 English people migrated to colonial America. (Fischer, 1991) However, the naturalization process was limited to white population until the 1860s when the benefit was extended to include blacks. Asians were included only in the 1950s. Since Asians make up more than 50% of the world's population, Immigration in the US started seeing an increase in inflow of people from Asian countries. (Fischer, 1991)

Immigration largely has been seen as something that is beneficial to the US economy as immigrants make up more than a third of the US workforce. Having a good number of working-class people keeps the wheels of the economy moving, shortages of which can otherwise cause some weakness. There have been studies indicating the typical American in fact benefits from both high skilled as well as low skilled immigration. One study suggests that even though the immigrants from certain regions such as Latin America received more services

than the total taxes they paid – thereby causing net loss, the overall economy gained as this led to increase in the wages of high skilled workers and lowering of the prices of goods and services (Smith, *1997 p. 5)*

Even though there are many social, economic, political as well as religious issues related to immigration, this culminating experience project focuses only on the non-immigrant Visas.

Problem Statement

There has been extensive research related to the immigration trends in the US. There is a lack of data prior to the 1970s related to immigration, but over the past few decades, there has been an explosion in the kind of data and the attributes gathered around immigration. As a result, the nature of the data has also become very complex and it is hard to answer a multitude of questions just by taking a look at the collected data. Some examples of how immigration data can deliver real-life benefits are:

- Using data to incentivize people with the right skill sets can help close the domestic labor market gaps.
- Targeted initiatives can help increase immigrant's employment rates by offering programs that match the job market.
- Data driven interventions can help identify human trafficking cases more aggressively, which can help a lot of victims. (McKinsey & Company, 2018)

This project attempts to answer the following questions related to immigration:

1. What are the various Visa Types and the number of applications by that visa type?
2. What are the trends in the number of Visa applications by type.
3. Is there a correlation between the type of Visa and the country where the applicants are coming from?

4. Which places are likely the hub for employers and sponsor the majority of H1B Visas. What are some of the other hot spots and what are the reasons for growing demand in those regions?
5. How does the salary earned by each Visa type compare to the average American native?
6. How does the immigrant population compare to the US-born population when it comes to education level?

CHAPTER TWO

LITERATURE REVIEW

An estimated 258 million people currently reside outside their country of birth—a number that has almost tripled in the past 50 years (McKinsey & Company, 2018). Thus, this data has implications across multiple dimensions - from border control to labor market participation and integration. There is a general consensus among policy experts and academics that in order to improve governance in immigration we need to have better quality data (McKinsey & Company, 2018). This is the reason why scholars have been asking for standardization and distribution of the data for migrants settled in each country. The evidence for such a demand from experts has been as early as 1891, where this was recommended at the International Statistical Institute in Vienna (Falkner, 1895). Even though this interest in improving the quality of immigration data has regained momentum lately, very little has actually been done in order to achieve this. The high-quality data that can influence governing policies is still very limited. This also applies to the data that has been gathered for the immigration to the US. The type of visa is determined by the purpose of travel to the USA. The two main categories are:

1. **Immigrant Visa**: This type of visa is issued to foreign native who plan to live permanently in the USA.

2. **Non-Immigrant Visa:** It is issued to a person who intends to be in the US, on temporary basis for tourism, medical treatment, business, temporary work or study.

The common types of USA Visa which are used in the data set are:

a) **H-1B:** This type of visa allows US employers to temporarily employ workers in speciality occupations. It required the application of specialized knowledge and a bachelor's degree or the equivalent of work experience. (United States Department of State, 2019)
b) **L-1:** An L-1 visa is a visa used to enter the United States for the purpose of L1 status. Issued to intracompany managers or executives
c) **F- 1:** It allows you to enter the United States as a full-time student at an accredited college, university or other academic institution or in a language training program. (United States Department of State, 2019)
d) **TN:** The nonimmigrant NAFTA professional (TN) visa allows citizens of Canada and Mexico, as NAFTA professionals, to work in the United States in prearranged business activities for U.S. or foreign employers.
e) **E-2:** It allows an individual to enter and work inside of the United States based on an investment.
f) **B-2:** This type of visa includes tourists, vacationers and pleasure visitors for medical treatment. (United States Department of State, 2019)
g) **Parolee:** Parole allows an individual who may be inadmissible or otherwise ineligible for admission into the United States.

h) **EWI:** Entry without inspection occurs any time a foreign national cross into the U.S. without presenting themselves at a border checkpoint and obtaining permission to enter the country.

i) **J-1:** It is a non-immigrant visa issued by the United States to research scholars, professors and exchange visitors participating in programs that promote cultural exchange specially to obtain medical or business training within the U.S. (United States Department of State, 2019)

David Card, an economist who has done one of the most widely recognized studies on the subject of immigration studied the impact of immigration on the bottom 25% earners in Miami in response to the claim that such people between the ages of 16 and 60 were impacted negatively. He found that there was no significant impact to them. His study concluded that with the newcomers taking up jobs, natives ended up moving to even better occupations. (Card, 1990)

Similar techniques were also used by William and Sari Kerr, who studied the impact on native employment due to an increase in H1B visa holders coming into the United states. This study was conducted by using a dataset from the US Census Bureau (Longitudinal Employer-Household database). This study estimated the effect of increased foreign workforce in the science, engineering and match fields on actively looking native employees (Kerr & Kerr, 2013). In their study, they set up a regression equation in which the variables such as time unemployed and the salary of the next job were plotted with the number of foreign workers at the firm that they left. They find that from 1990 to 2008, employees who left a STEM firm after their firm hired abnormally high numbers of

foreign workers waited longer for new work and have reduced earnings, compared to workers in non-Stem fields. They also note that the conclusions reached were non-causal and thus any explanation for the impact to non-STEM fields is not provided. (Kerr & Kerr, 2013). Madeline Zavodny worked upon a contrasting study in which he ran a regression analysis upon the concentration of H1B workers along with their salaries, cities and unemployment rates in those cities. The findings from this study also suggest that there was no negative effect of H1B employees on the wages or employment in the IT field (Kerr & Kerr, 2013)

Apart from these researchers, there have been many other studies specifically into non-immigrant STEM workers and their spouses. A good example of such a study is the one done by Divya Ravindranath, which highlights the impact of Visa regulations and Labor Market restrictions on the Indian women in the United States. (Ravindranath, 2017)

CHAPTER THREE

THE METHODOLOGY

Data Sources and Collection

Data used for this project includes immigration data from years 2012- and information on wages offered, education, visa status history, job postings, filing lawyers and final decision. After data collection, Data cleansing was performed and then analyzed. The data was collected and distributed by the US Department Labor.

Data Set Description

Kaggle.com has collected the data from the US Department of Labor. According to the dataset standpoint, a permanent labor certification issued by the Department of Labor (DOL) allows an employer to hire a foreign worker to work permanently in the United States. DOL works to make sure that permitting foreign workers into the U.S for work does not have an adverse impact on job opportunities, wages or working conditions of US workers.

This dataset contains details about different types of Visa. A native of a foreign country who seeks to travel to, enter and remain in the USA must first obtain a US visa. There are 3 million records and 154 columns in the dataset for 2012-2017.Table: Data Set Description (US Permanent Visa Applications Dataset, 2012-2017).

Topmost attribute which are used are mentioned below:

Table1. Dataset Description

#	Attribute	Description
1.	Application Type	Different Types of Application
2.	Case No	Number Assigned to Each Cases
3.	Case Received Date	Date on which Case was Received
4.	Case Status	Different Status of the Case such as Certified, Expired, Denied and Withdrawn
5.	Class of Admission	Aligns with initial Visa Type
6.	Country of Citizenship	Refers to the country in which a person is born
7.	Decision Date	Date on which Decision was Made
8.	Employer City	Destination Cities for which Visa is Applied
9.	Employer Country	Destination Country for which is Applied
10.	Employer Name	Name of the Employer who applied the visa
11.	Employer State	Destination State for which is Applied

12.	Foreign Worker Info Education	Applicant Education Level
13.	Employer Address	Address of the Employer
14.	Job Info Job Title	Different Positions
15.	PW SOC Title	Prevailing Wage Title
16.	Remuneration	Money Paid for work or Service
17.	PW SOC Code	Standard Occupational Classification Code
18.	Pw Unit of Pay 9089	Prevailing wage amount bi-weekly, hour or weekly etc.
19.	Pw Amount 9089	Prevailing Wage Amount
20.	Employer Postal Code	Postal Code for the Employer
21.	US Economic Sector	Different Economic Sector in USA
22.	Wage Offered Unit of Pay 9089	Wages offered on basis of monthly, hourly etc.

Tools

Tableau

Tableau is a data visualization tool that provides pictorial and graphical representations of data. It is a prevailing and fastest growing data visualization tool used in Business Intelligence. Tableau helps to connect data and build workbooks, stories and dashboards. (Tableau Software, 2021) These days most of the organization uses Tableau heavily and effectively such as Nike, Coca-Cola, Skype, The World Bank, Wells Fargo, Citigroup, America, The New York Times etc. The largest segments that use Tableau are Computer Software (15%), Information Technology and Services (6%) and Hospital and Health Care (5%). Tableau permits to create Dashboard that allows non-technical users to access and use the data with creative and real-time visualization. (Tableau Software, 2021)

Tableau has the drag and drop functionality for creating data visualization, running data analytics and reports. It also does not require prior coding experience and has a very small learning curve as long as someone has some prior experience working with data and is familiar with advanced concepts in MS Excel or other spreadsheet programs. It can import data from multiple data sources including databases and a wide variety of spreadsheet programs (Tableau Software, 2021). Data visualizations are created using Tableau Desktop 2020.4.

Python

Python is well-defined as an object-oriented high-level programming language. It's frequently used as a “scripting language” for web applications. It is focused on simplicity, readability offering a host of helpful options for data analysts/scientists simultaneously. It can be used for performing data analysis. It is available on Windows, Mac, Linux etc. Python is often used as a supporting language for software developers, for build control and management, testing and in many other ways. (Python Org, 2021)

Jupyter Notebook

“The **Jupyter Notebook " is** an open- source web application that lets you build and share documents that hold live code, equations, visualization and explanatory text. It includes data-cleaning, data visualization, machine learning, statistical modeling and transformation. Jupyter Notebook can be executed on a local desktop that requires no internet access or can be installed on a remote server and can be accessed through the internet. (Project Jupyter, 2021)

Why is Python Essential for Data Analysis?

It is easy to learn, Flexible, Open-Source, Well Supported. Lots of data-centric Python packages are available which make the process of data analysis a lot quick and convenient. It includes Data Analysis Libraries: Pandas, Data Frames,

NumPy multi-dimensional arrays and SciPy libraries to work with various datasets. (Python Org, 2021)

While it is essential for graphics, Python's matplotlib emerges as a good package, and for machine learning tasks, scikit-learn becomes the ideal alternative.

In this project, python libraries are used for data cleaning and data manipulation. All analysis is done in Python 3.7.4. Python Jupyter Notebook is used for Data Analysis.

Differences between Tableau and Python

Table2. Python and Tableau

#	Python	Tableau
1.	It can be used for Data Analytics and Visualizations.	It is an interactive data visualization product used in Business Intelligence.
2.	It was developed in 1991 and was designed by Guido van Rossum.	It was developed 16 years ago by Chris Stolte and Christian Chabot.
3.	Python language is most suitable to code for machine learning to use it easily and library support is available.	Tableau can perform efficient ML operation over data sets which can be used to built-in python capabilities with Tableau.
4.	Python can be used to develop web apps, gaming apps, desktop GUI,	Tableau is used from connection through collaboration. Dashboards can be built to show interactive government budgets, Every Upcoming Solar Eclipse until 2080

	enterprise-level applications, ML apps, image processing and text processing.	(posted by The Washington post), Outbreak Map etc.
5.	Python has a short and clean syntax which is liked by the software developers.	Developers prefer Tableau for its mapping functionality.
6.	Python has support in open source community and has a huge standard library.	Tableau helps self-service Business Intelligence.
7.	Multiple graphing libraries.	It can instantly consume libraries.
8.	Python 3 software can be installed on laptop and run complex code.	Tableau platform is available on Laptop, mobile as well as tablet.

Data Cleaning

Data Cleaning refers to the collection of techniques used to fix or remove corrupted, incorrectly formatted data so that it is conducive for data analysis. It also involves removing duplicate or incomplete records in order to make sure that the nature of data does not skew the results of the analysis. When combining multiple data sources, there are many opportunities for data to be duplicated or mislabeled. (Agarwal, 2018)

Cleaning up dirty data makes it easier to combine and analyze data or make it easier for others to understand data when sharing data sets. (Python Org, 2021). While the data set has millions of records, it needs to be prepared for analysis. It will improve data quality which increases productivity.

The process of data cleaning cover the following steps (Agarwal, 2018):

1. Dropping irrelevant columns
2. Renaming columns to meaningful names
3. Inconsistencies of Data Values
4. Missing Values.

Data Cleaning is performed in Tableau and Pandas Data Frames in Python.

“**DataFrame"** is a 2-dimensional size-mutable, aligned as tabular data with rows and columns. Pandas Dataframe contains three components: the data, row and columns. (Python Org, 2021)

CHAPTER FOUR

DATA ANALYSIS AND VISUALISATION

Different Visa Type

The large number of petitioners applying for H1b visa, compared to other visas. It allows USA employers to employ immigrants and work in specialty occupations. Also, if a worker is fired or resigns the job of the sponsoring employer, the foreign worker must either look for another employer or change the status/else have to leave the USA. (United States Department of State, 2019)

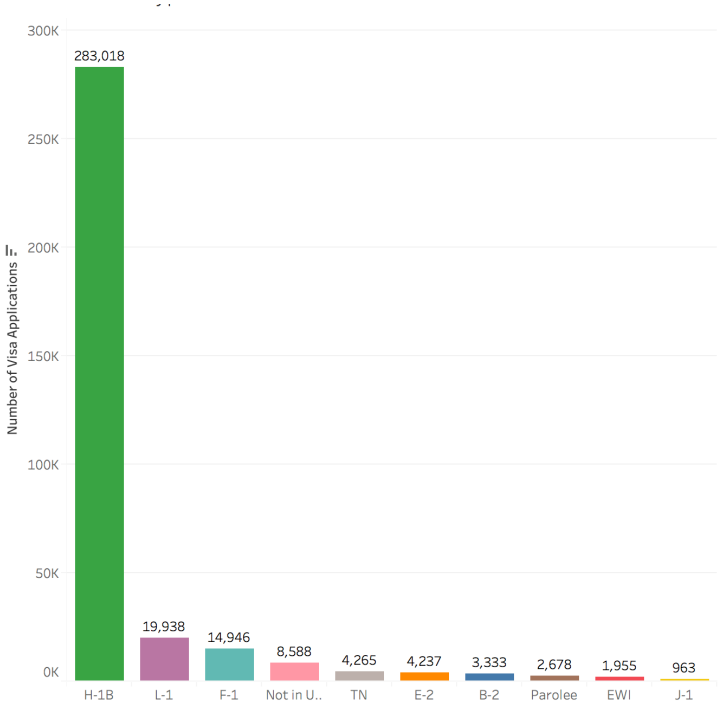

Figure 4-1. Different Visa Types Applied

Number of Applicant Case Status

Number of Applications has increased every year. However, it is remarkable to see that since 2013, the number of “Denied Visas” appear to have remained constant.

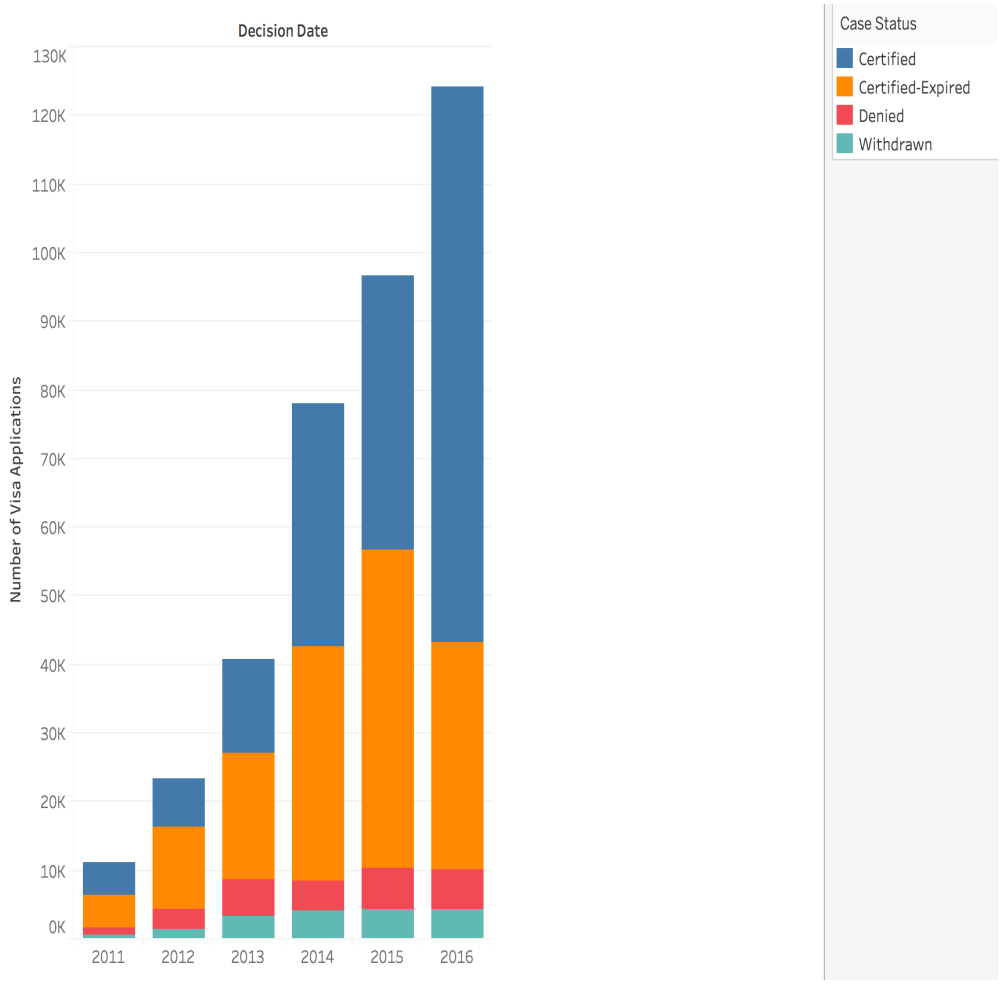

Figure 4-2. Application Case Status Over the Years

Different Application Type:

Online submission is one of the most popular forms of application type. Filling a form online is easier and faster than filling on paper.

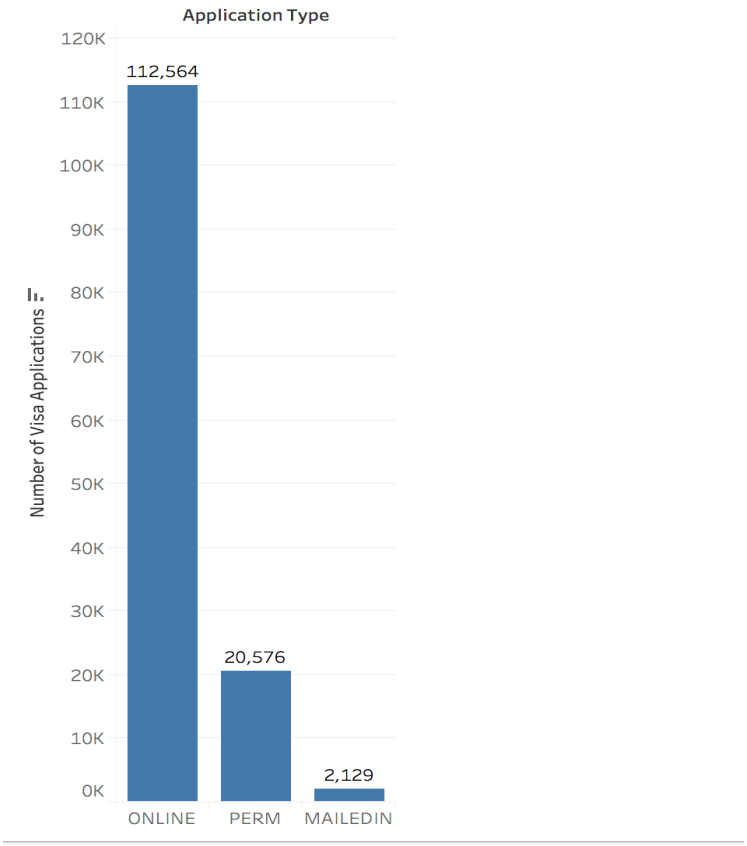

Figure 4-3. Visa Application Types

Trends of Visa Applicants by Type and Each Year:

Over the years, H1B visas have been a very attractive option to the immigrants who aspire to further their career. Each year USCIS grants a total of 85000 H1B visas - 20000 out of which are reserved for applicants having master's degree or higher. The remaining 65000 are open to everyone including

candidates with a bachelor's degree. The application is accepted by UCISCS starting the first week of April. Within the first week, the visa allocation is exhausted, and is tremendously increasing each year as compared to other visas.

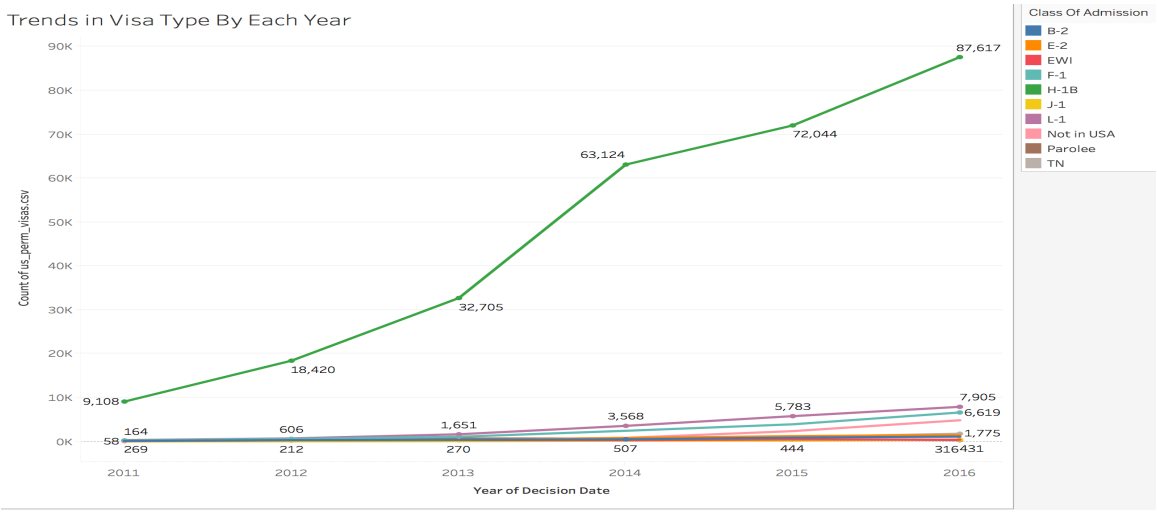

Figure 4-4. Trends of Visa Applications by Type and Year

Trends in Visa Applications by Case Status

In Figure 4-5, we can see that while the number of positively considered applications increases whereas the number of “Denied” One seems to be similar.

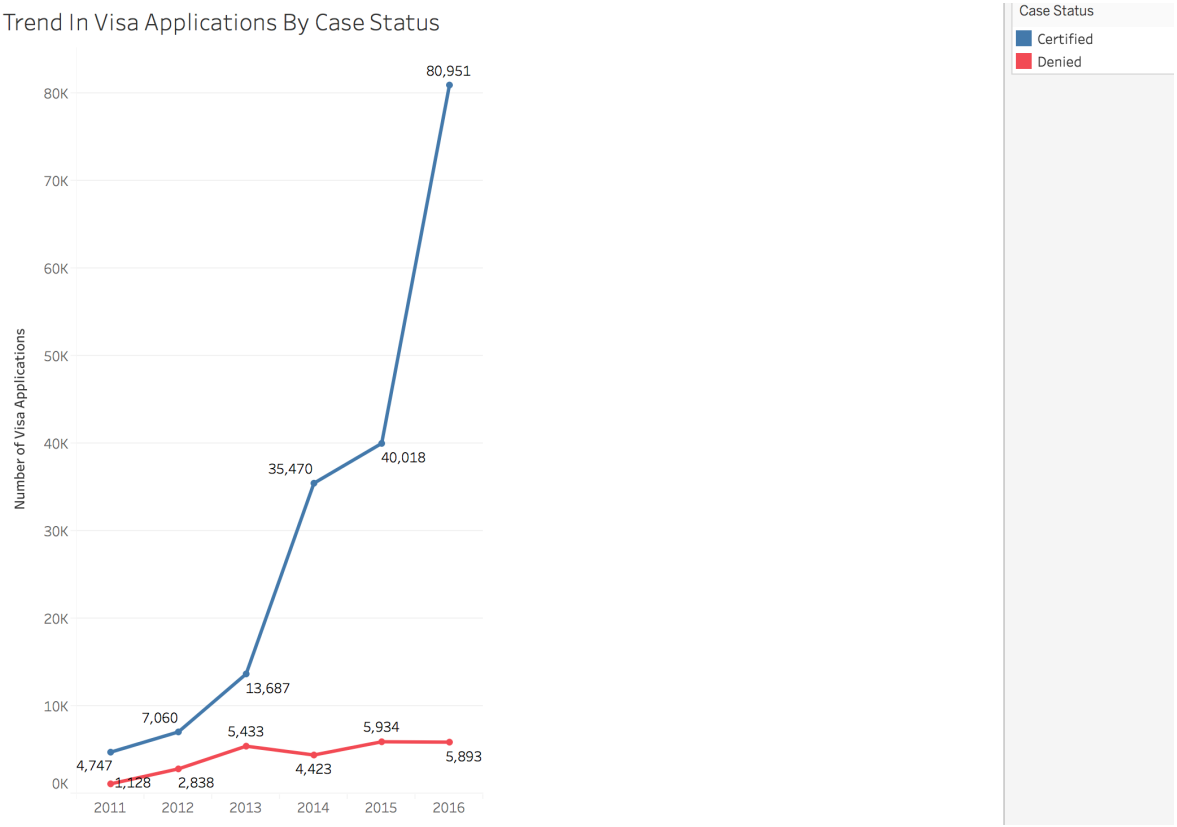

Figure 4-5. Trends of Visa Applications by Case Status

Number of Applicants Applied by Country of Citizenship:

Figure 4-6 shows that the majority of Visa Applications have been submitted by Indian citizens. It consists of more than half of our observations.

Figure 4-6. Number of Applicants applied by Country of Citizenship

Correlation between type of Visa and Country:

For decades, Indian IT services companies are stepping up for outsourcing (Also seen in Figure 4-10). So, the number of applications for H1B from India is highest as compared to other countries. China, in spite of being the most populous country in the world has far less number of applications. It should also be noted that the demand for the foreign workforce is also huge in the IT sector when it comes to the US labor market. (Bureau of Labor Statistics, 2020)

Country Of Citizenship	H-1B	L-1	F-1	Not in USA	TN	E-2	Parolee	B-2	EWI	J-1
CANADA	9,131	687	75	91	2,975	133	31	32		18
CHINA	20,512	1,792	1,480	1,367	7	5	21	32	12	17
INDIA	172,851	8,775	4,142	867	9	3	2,224	99	42	76
JAPAN	1,568	225	233	45		314				19
MEXICO	3,551	476	41	113	1,079	74	3	135	952	11
PAKISTAN	2,556	86	186	82	5	40	3	94	15	38
PHILIPPINES	5,138	200	136	626		26	7	606	9	25
SOUTH KOREA	6,037	465	4,244	2,625	1	1,999	2	797	19	103
TAIWAN	2,787	244	414	85		78	1	21		10
UNITED KINGDOM	2,976	880	50	76		231	2	9		37

Figure 4-7. Number of Visa Applications on the basis of Visa Type and Country

Number of Visa Applications Applied by Employer City

A positive trend can be seen in most popular cities such as New York, Mountain View, San Francisco, Plano etc. In College Station during 2015 the number of submitted Visa Applications was more or less twice large as in other cities.

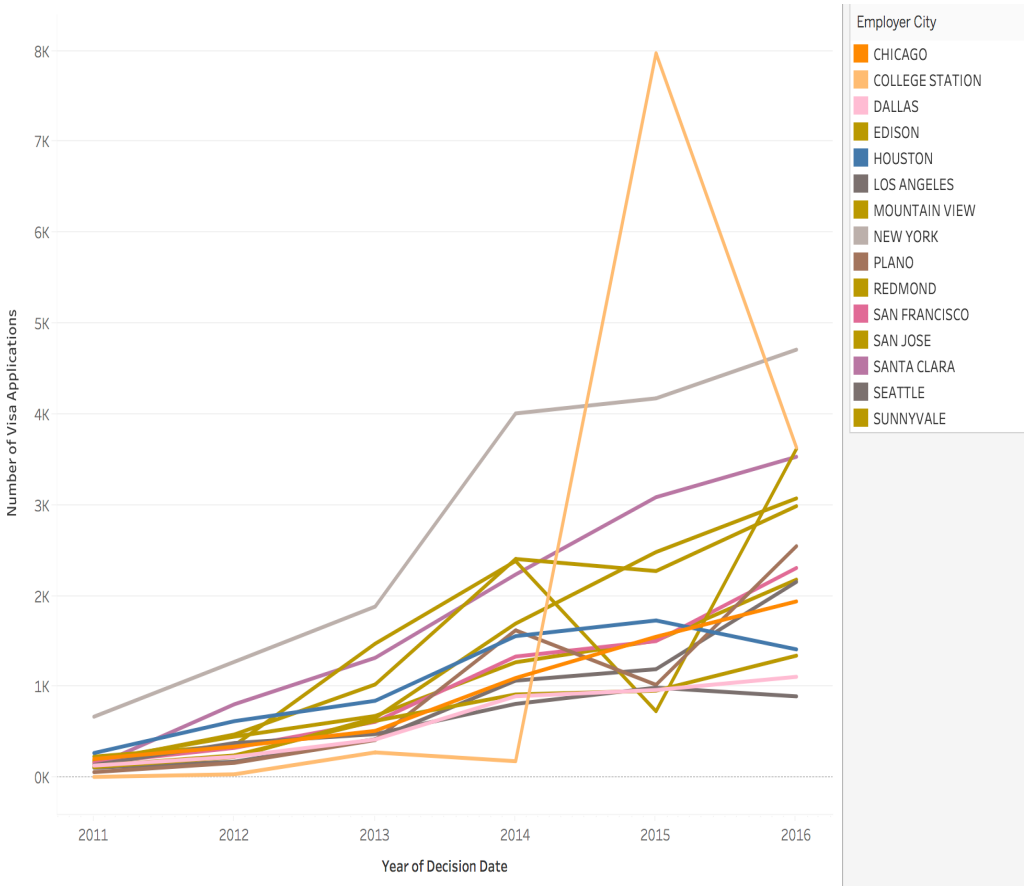

Figure 4-8. Number of Visa Applications Applied by State

	Decision Date						
Employer City	2011	2012	2013	2014	2015	2016	Grand T..
CHICAGO	207	343	516	1,098	1,552	1,941	**5,657**
COLLEGE STATION	9	38	279	182	7,975	3,635	**12,118**
DALLAS	134	231	421	897	966	1,111	**3,760**
EDISON	131	246	626	917	958	1,344	**4,222**
HOUSTON	272	623	847	1,559	1,731	1,413	**6,445**
LOS ANGELES	141	382	480	813	992	896	**3,704**
MOUNTAIN VIEW	117	228	658	1,697	2,484	3,075	**8,259**
NEW YORK	672	1,276	1,884	4,010	4,176	4,712	**16,730**
PLANO	62	164	415	1,623	1,023	2,549	**5,836**
REDMOND	233	356	1,476	2,385	732	3,620	**8,802**
SAN FRANCISCO	162	329	615	1,334	1,504	2,309	**6,253**
SAN JOSE	173	476	1,027	2,408	2,275	2,990	**9,349**
SANTA CLARA	125	809	1,320	2,237	3,088	3,533	**11,112**
SEATTLE	110	177	424	1,069	1,195	2,156	**5,131**
SUNNYVALE	191	453	680	1,271	1,509	2,181	**6,285**

Figure 4-9. Number of Visa Applications Applied by state – (Tabular)

Number of Visa Applications Applied by Employer

Most of the companies for Visa applicants here are IT companies.

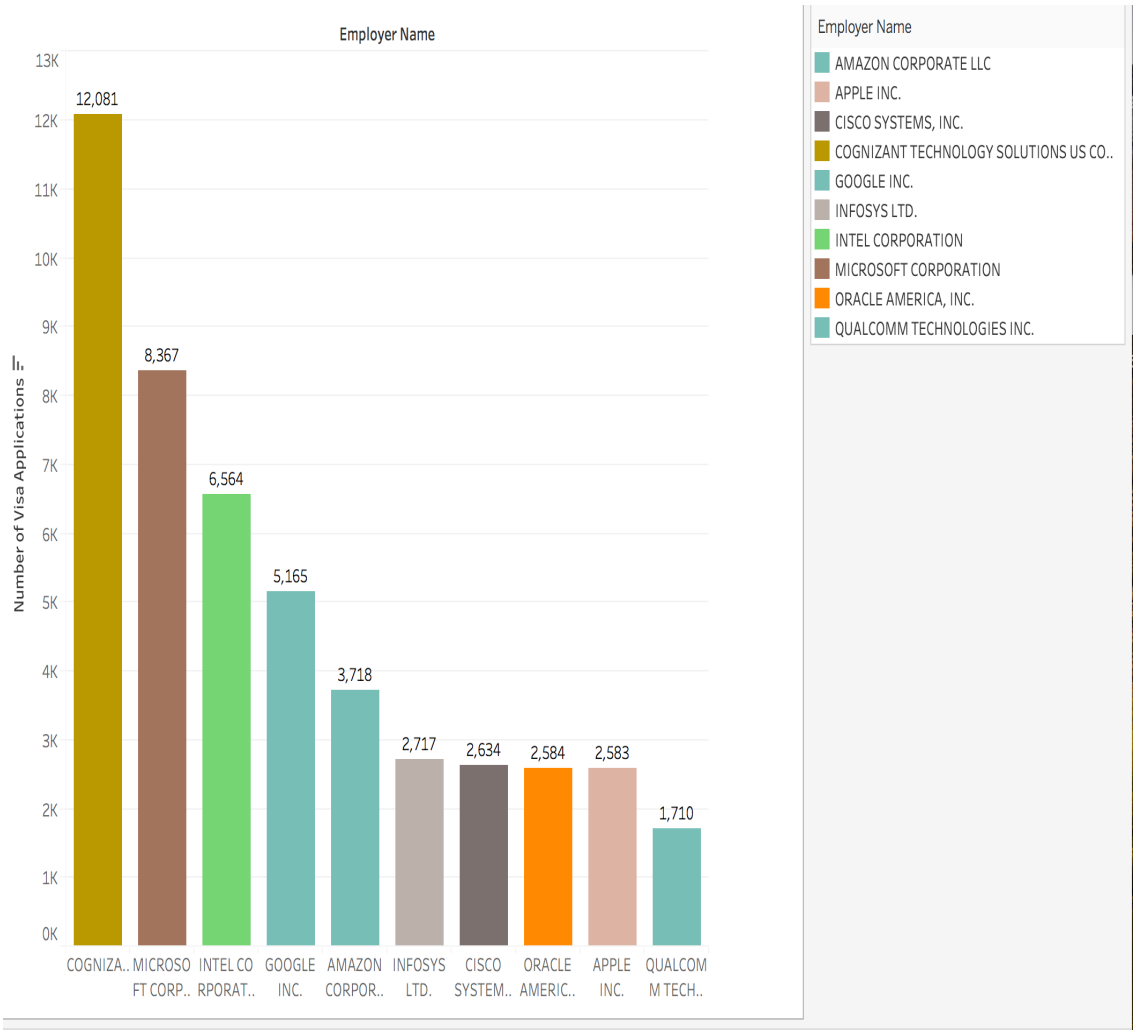

Figure 4-10. Number of Visa Applications by Employer

Different Industries Affected by Visa Applications

Figure 4-11 shows that data present in the US economic sector indicates that IT and Advanced Manufacturing are the most expedient sectors for immigrants.

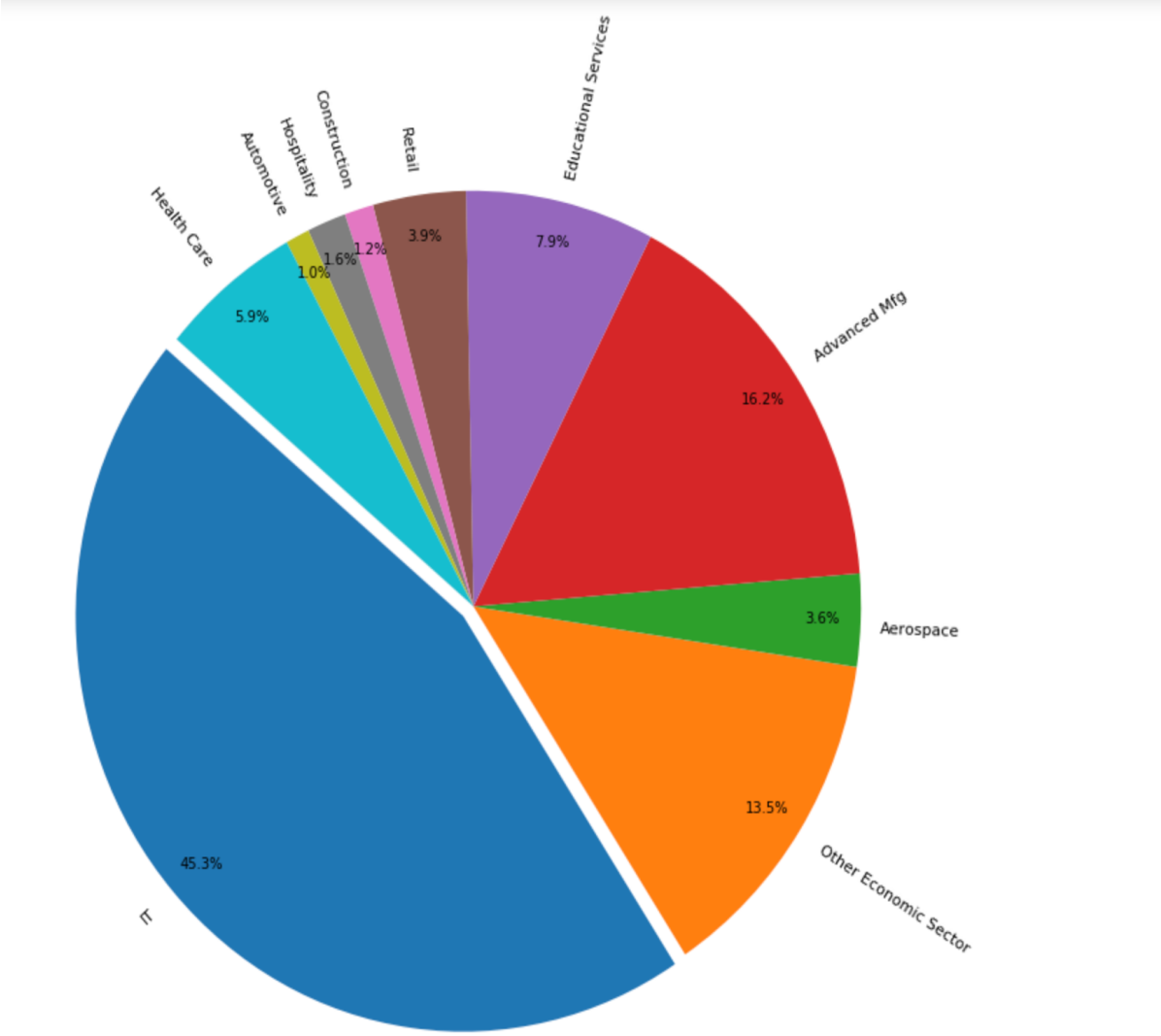

Figure 4-11. Trend of Different Industries

Number of Visa Applications by Job Title

Huge demand for IT Specialists in the USA and being one of them surge the chance to acquire a permanent Visa. According to the Bureau of Labor Statistics, more than 50% of the foreign-born labor force works in management, professional, IT and Services fields (U.S. Bureau of Labor Statistics, 2020). Also, as shown in Figure 4-16, more than 40% of the workforce in the IT industry is impacted by the H1B visas. Moreover, we can see almost all the positions except “Assistant Professor” are derived from the IT industry.

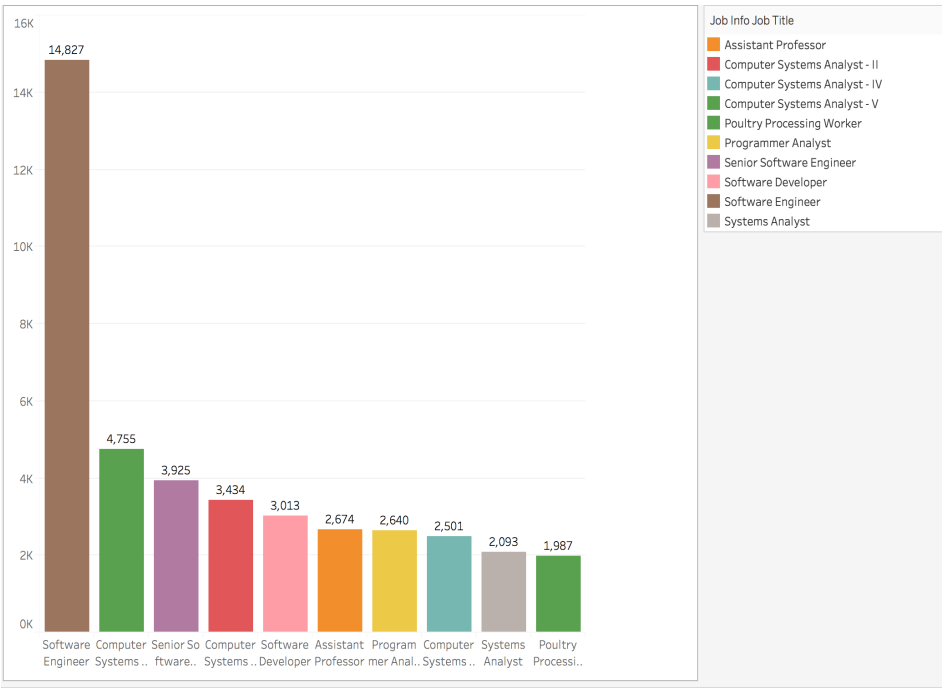

Figure 4-12. Number of Visa Applications in the US by Job Title

Visa Applied on the Basis of Education Level

Figure 4-13 shows that more than 50% percent of applicants had a university degree.

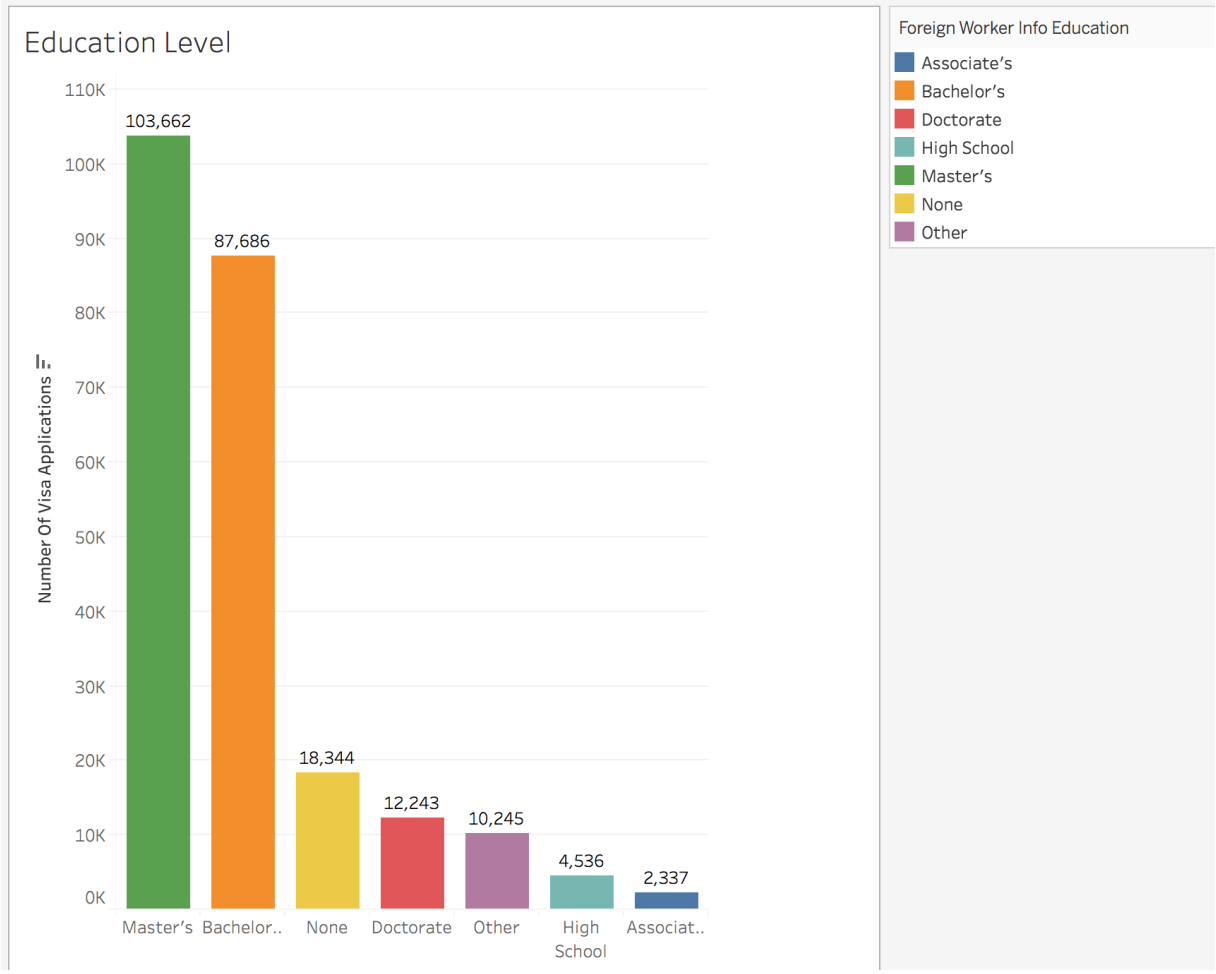

Figure 4-13. Trend of Education Level

Salary Earned by Different Visa Applicants

Figure 4-14 shows that 65 percent of the applicant's salary between 60 and 120 thousand dollars yearly. Immigrants earn less than natives when they enter a new country, but their wages grow over time.

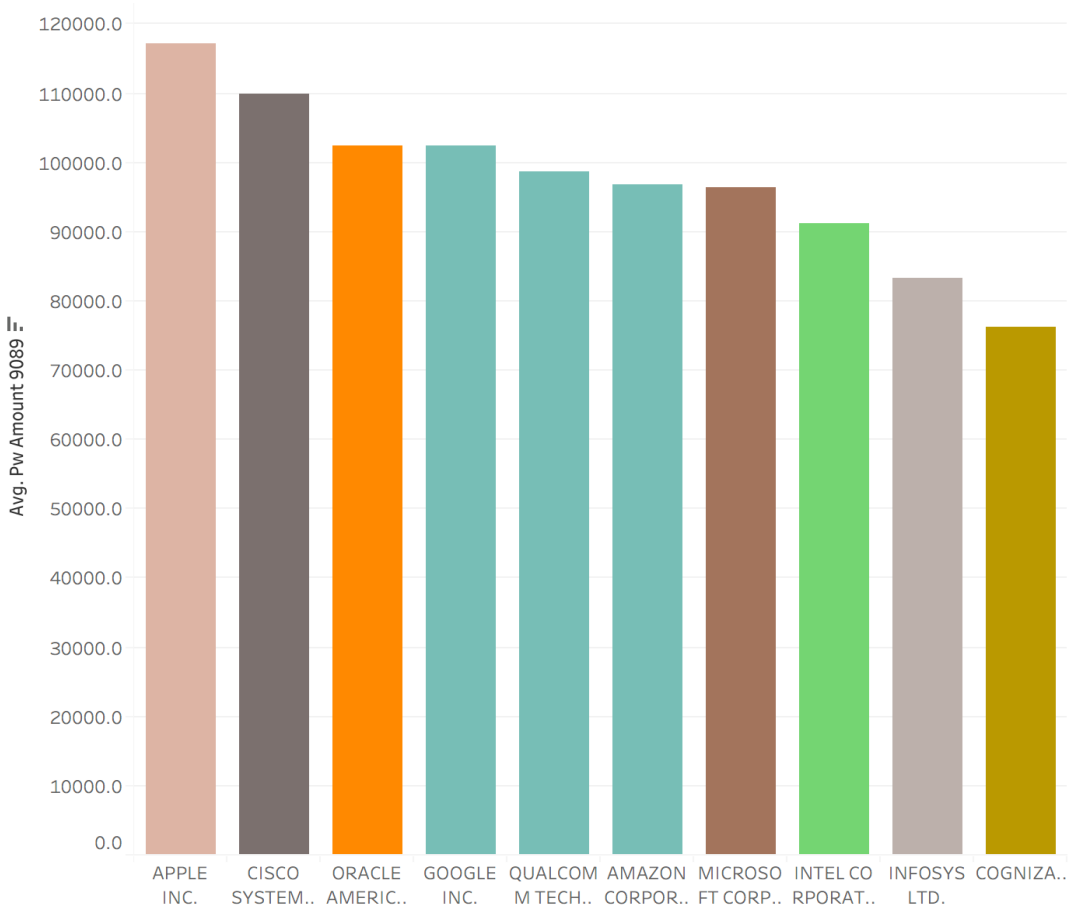

Figure 4-14. Salary Earned by Visa Applicant

Immigration Stats Platform

A dashboard is created for several views, to compare a variety of data simultaneously and to address questions related to Immigration. This platform is deferred into three parts:

- Different Visa Type at a Glance
- Trends in Applications
- Number of Visa Applied by Employer

Different Visa Type at Glance

Figure 4-15 shows a Tableau dashboard with several views of different visa types, application type, application status over years and number of applications by Country of Citizenship.

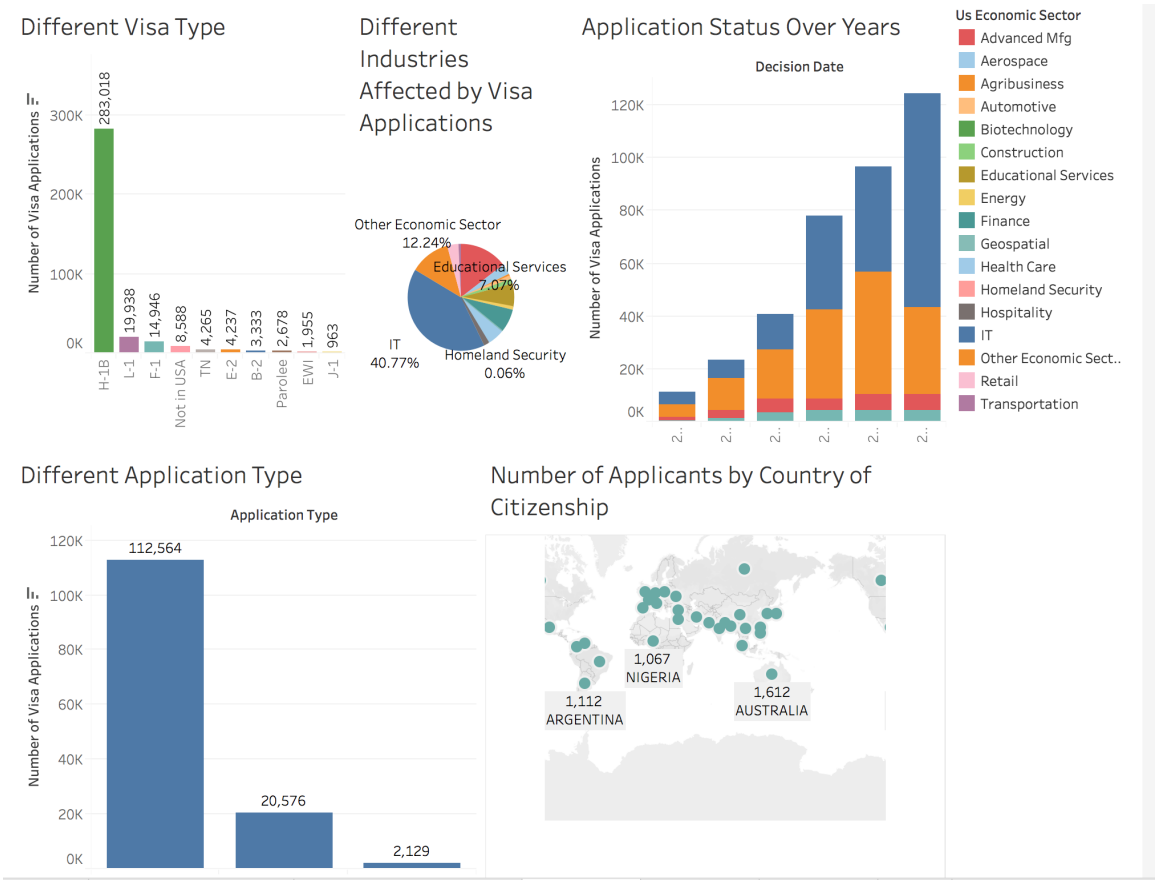

Figure 4-15. Different Visa Types at a Glance

Trends in Applications

This dashboard will give an overview of different trends such as Visa applications by case status and each year. It also focuses on Number of Applicants on the basis of Country of Citizenship.

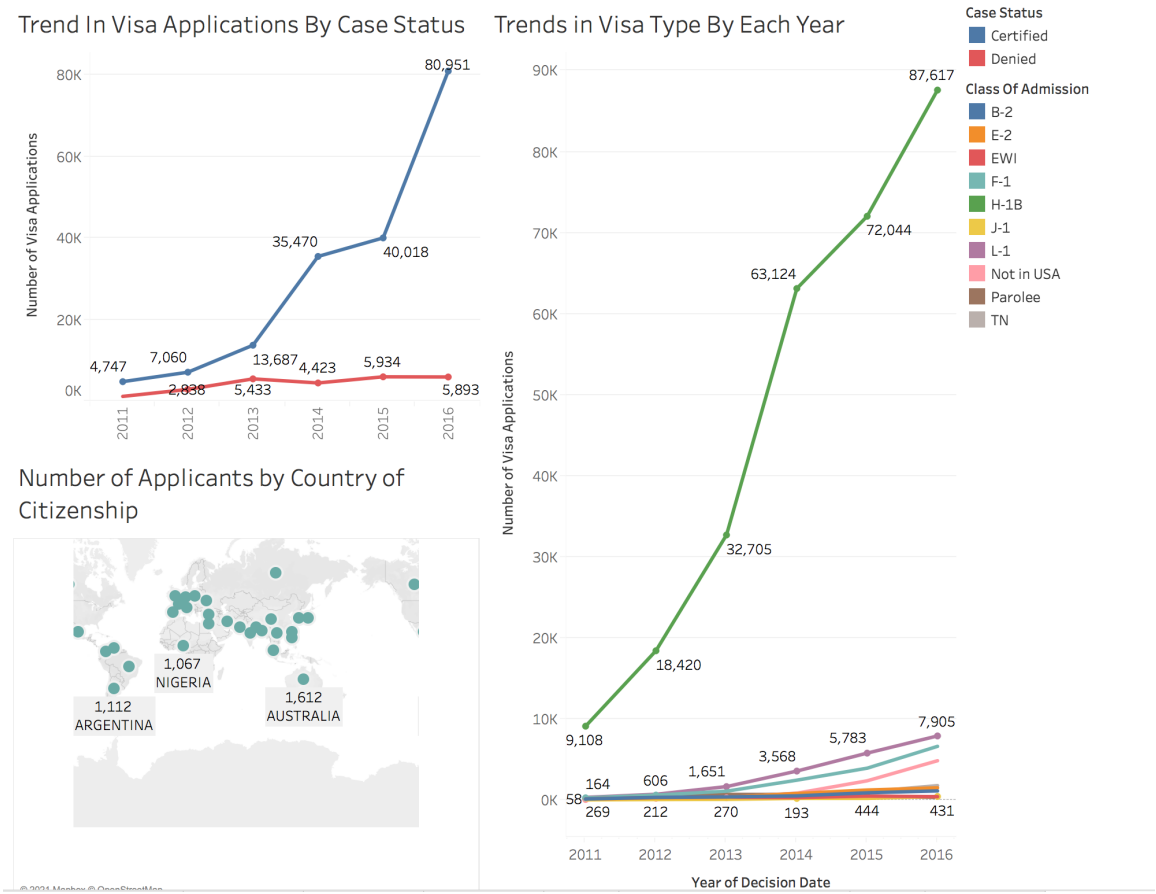

Figure 4-16. Trends in Visa Applications

Number of Visa Applied

This dashboard focuses on the number of visas applied by employer, number of visas applied by each state and number of visas applied by job title. Also, it shows the trend of education level.

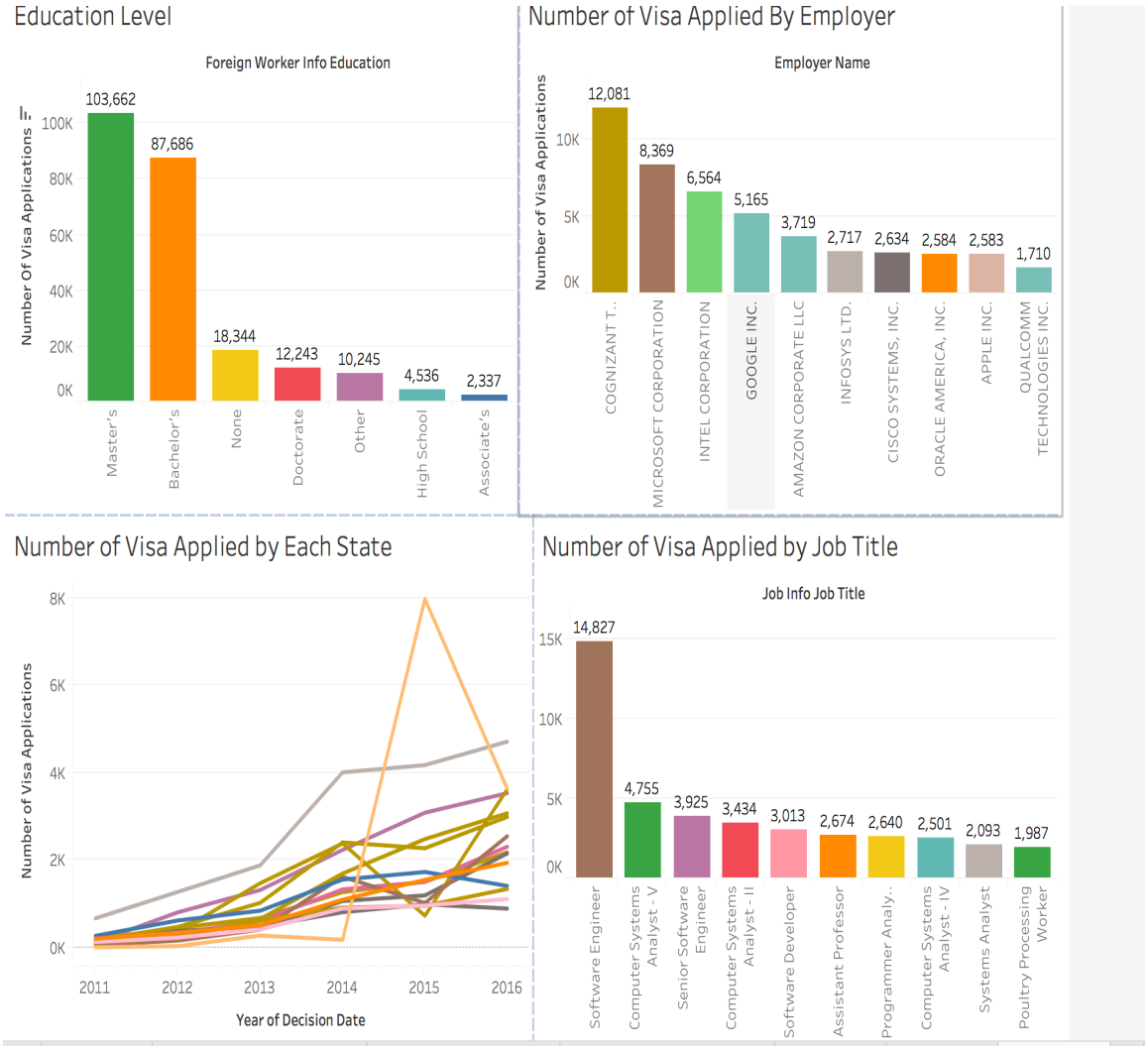

Figure 4-17. Dashboard – Number of Visa Applications

CHAPTER FIVE

RECOMMENDATION

Results from this analysis suggest that immigration is overall beneficial to our country. It can be concluded from the analysis performed that the immigrants arriving into the U.S. have no adverse impact on the economy and the jobs of native people. There is however enough evidence to suggest that the immigrants fuel innovation and strengthen our communities. On top of that they also grow the middle class which forms the backbone of our society.

Reasons for Denial of USA Visa

The United States Embassy interviews the applicants at the embassy by a consular officer. The applications are approved or denied based on the standards established in the U.S. law. While the majority of applications are approved, there are a certain set of rules that govern the scenarios in which the visa application may be denied.

The following are the top reasons by which visa applicants are denied:

1. Being unprepared.
2. Applying for the wrong visa.
3. Providing incorrect or insufficient information
4. Giving too much information
5. Ineffective communication

The current immigration policy can be improved to help native-born Americans further and keep the families together at the same time. There should be laws in place that encourage legal, highly qualified immigration into the country. For example, there are laws that allow people to enter the country, study, work for a few years but no laws to ensure their long term stay in the country. This exodus of people who gained skills while staying in the country keeps the U.S. from reaping the benefits of these skills, which these people take to other countries.

When people who adopt illegal means to enter and remain in the country and eventually get rewarded with legal status and other benefits, it is extremely unfair to those who entered legally and have been waiting for their turn for multiple years. More than any country in the world, the United States has welcomed millions of people around the globe.

There should be a comprehensive place as it has become a hot topic since 2009.

1. Create a committee to adapt the number of visas available to changing economic times.
2. A program to provide a path to legal status for legal immigrants.
3. A program to help immigrants adjust to life in the United States.
4. Revision of rules related to H1B Visas that propose preventing immigration.

CHAPTER SIX

FUTURE WORK

In this study, we covered various trends in visa applications, their distribution by demographics, work sector, etc. In terms of future research, we should also study the social and cultural impact of immigration and the policies on the US. I will be making this analysis available to the US government and publicly available through ScholarWorks. More feature selection and data cleaning can be performed on this data set. Machine Learning algorithms can be performed by dividing the dataset into two data frames. Later on, we can use a Grid Search object with cross-validation to find the best parameters for Logistic Regression, k-nearest Neighbor, Random Forest and Gradient Boosting Classifiers. This will split the data repeatedly using Stratified K-Folds cross-validation and train multiple models. Logical Regression classifier will help to give maximum accuracy on testing dataset. Later on, one could build precise models and apply Gradient Boosted Machines as a part of the Machine Learning algorithm. This will increase the predictive capability of the data.

By incorporating multiple resources - for example if we can incorporate the criminal cases involving immigrants and their attributes, by building deep learning and predictive models, we can help the government to make data backed decisions when it comes to granting visas and the naturalization process of immigrants.

CHAPTER SEVEN

CONCLUSION

Evidence suggests that immigration has largely benefited the US economy, led to a better educated workforce, greater occupational specialization, better matching of skills with jobs and higher overall economic productivity. This culminating project shows that the US economy is huge enough, and that, immigration will not have much effect on wages or the employment rate. From this data set, we are able to check the general trend in Visa applications, employers, cities, the most popular citizenships and predicting the applications on the chosen features.

The exploration helps us to comprehend the various types and trends of visa and the number of applications by visa type. Moreover, it focuses on correlation between the type of Visa and the country where the applicants are coming from and the salary earned by each Visa type compared to the average American native. It also demonstrates comparison between the US-born population and immigrants when it comes to education level. However, this study recommends that there should be a smart policy which helps the economy and illegal immigrants should not be given legal status.

APPENDIX A:

CODE

```
In [ ]: us_economic_counts = {}

for value in df['us_economic_sector'].dropna():
    if value in us_economic_counts:
        us_economic_counts[value] += 1
    else:
        us_economic_counts[value] = 1
```

```
# Us Eonomic Sectors LISTS
usecolabels = []
usecovalues = []
explode = (0.035, 0, 0, 0,0,0,0,0,0,0)

for key, value in us_economic_counts.items():
    usecolabels.append(key)
    usecovalues.append(value)

#Setting plot parameters
plt.figure(figsize=(13,13))
sns.set_context(rc={"font.size":10,"axes.labelsize":11,"xtick.labelsize" : 11})
plt.pie(usecovalues[:10], labels=usecolabels[:10], explode = explode, autopct='%1.1f%%', pctdistance = 0.9,
        rotatelabels = 90, startangle=140, labeldistance = 1.05)
```

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