2029 U.S. Job Market Evaluation Proposal

A.) Project Request:

Ten years from now, in 2029, there are likely to be significant changes in the make-up of the United States workforce. Two unique questions come to mind:

1.) Approximately what percentage of the United States workforce will be working in the gig economy? The gig economy is defined as work that is temporary and flexible.

2.) What percentages will be working remotely, in contract, freelance, or in some other form of a non-traditional on-site position?

The goal of this project is to gather an understanding of the existing market and trends to forecast out employee makeup ten years into the future. The project is centered around core Amazon business units; not the actions of subsidiaries.

B.) Stakeholder(s):

The primary client is Beth Galetti, Amazon's Senior Executive VP of Human Resources [7]. She is primarily responsible for the planning of facilities and workspaces needed as part of the HQ2 expansion. The Executive VP wants to make effective use of resources and minimize expenses while ensuring there are adequate workspaces available. Regardless of the Amazon timeline to begin operations in the HQ2 facility, a long-term study is needed to effectively plan for the new facility and the first few years of operational staffing.

The list of U.S. finalist cities as of the end of 2017 in alphabetical order are: Atlanta, Austin, Boston, Chicago, Columbus, Dallas, Denver, Indianapolis, Los Angeles, Miami, Montgomery County (PA), Maryland, Nashville, Newark, New York, Northern Virginia, Philadelphia, Pittsburgh, Raleigh, and Washington D.C. Please note the shortlist is primarily centered around primarily east coast cities [4].

If considerably more talented workers will be found in the gig economy within the next ten years, dramatic changes will need to be made in HR policies. Some of these changes include flexible short-term compensation and benefits packages, an increase in wireless connectivity and security options and infrastructure to support remote operations, tax concerns related to free-lance employees, the redefinition of a team and how to achieve team cohesion, etc.

Decisions will need to be made at geographical, work classification (gig, seasonal temporary, contract, full-time permanent), and department (fulfillment center, driver, administrative, software development, analytics) levels.

Per Amazon's 2017 Annual Report on the Investor Relations site, as of December 31, 2017, the company employed approximately 566K full-time and part-time employees. In 2017 alone, Amazon directly created more than 130K new permanent, full-time Amazon jobs, not including acquisitions, bringing its permanent global employee base to just over 560K [1].

The Company also utilizes independent contractors and temporary personnel to supplement the workforce in three main channels. The first channel is utilizing temporary seasonal workers in its warehouses and customer service centers. According to CNET and Fortune Magazine, utilizing

2016 data, Amazon traditionally hires between 70K to 120K seasonal employees, with more than 14K of those positions converting to regular, full-time roles [5] [13]. Considerations for seasonal workers center on providing equitable contracts and ensuring available work center capacity.

There is limited information available to the public however it is important to recognize that most of Amazon's non-traditional workers are temporary seasonal workers and the number of season workers increases 5K to 10K each year [5]. Fulfillment and customer care centers can currently be found in the U.S. regions listed below.

Region	State
New England:	Connecticut, Delaware, Massachusetts, New Hampshire
Atlantic:	Maryland, New Jersey, New York, North Carolina, Pennsylvania, Virginia
Southeast:	Alabama, Florida, Georgia, South Carolina
Central:	Illinois, Indiana, Kentucky, Michigan, Ohio, Tennessee, Wisconsin
Midwest:	Kansas, Minnesota, Oklahoma
Southwest:	Texas
Mountain:	Arizona, Colorado, Nevada, Utah
Pacific:	California, Oregon, Washington

The second channel of temporary workers is Amazon Flex gig drivers who deliver Amazon Prime packages to customers. Glassdoor estimates the number of these flexible employees are between 5K to 10K employees [6]. Considerations for gig workers center on effective training and clearly defined roles to ensure all local, state, and federal tax and gig employment guidelines are being followed. Amazon would not wish to incorrectly classify contract workers as gig employees.

Amazon Flex is located across the U.S with operations located in New England, Atlantic, Southeast, Central, Midwest, Southwest, Mountain, and Pacific regions. Below is the list of cities in which Amazon Flex is offered with the corresponding U.S. census geographical region [15].

Region	City
New England:	Boston
Atlantic:	New Jersey, Philadelphia, Pittsburgh, Charlotte
Southeast:	Miami, Orlando, Tampa
Central:	Detroit, Milwaukee, Minneapolis
Midwest:	Kansas City, St. Louis, Kentucky Area
Southwest:	Dallas
Mountain:	Denver, Tucson
Pacific:	Pacific - Greater Los Angeles Area, San Diego, San Francisco Bay Area, Seattle, Renton, & Everett, Stockton (CA)

As this is a relatively new service, there is not enough data currently available to estimate Amazon Flex specific growth trends. However, we can surmise that the service is likely to expand further because after Amazon's acquisition of Whole Foods in August 2017, Amazon Flex has steadily expanded into new locations [12].

The third channel of temporary workers is personnel in the corporate office who are employed through staffing agencies. Contractors working at Seattle, Washington headquarters locations are comprised of the following occupations and approved contract agencies:

Job Functions	Staffing Agencies
IT, Web, & Software	OSI Engineering, Prime 8 Consulting, Q Analysts, Simplicity Consulting, Solutions IQ, TRC Staffing
Finance & Accounting	Affirma Consulting, Robert Half, Rylem, Simplicity Consulting, Two Degrees
Administrative Functions	Aerotek, Concentrix Daksh, Corestaff, Kforce, NetPolarity
Design & Creative	Creative Circle, Filter, Simplicity Consulting
Manufacturing	Aerotek, Integrity Staffing Solutions, Staff Management SMX
Sales & Marketing	Kforce, Simplicity Consulting
HR & Recruiting	Rylem, Simplicity Consulting
Engineering	OSI Engineering

Amazon does not release the number of corporate contract employees. The company has U.S. software development centers in the locations listed below [2-3, 8-11, 14].

Region	City
New England:	Cambridge
Atlantic:	New York, Pittsburgh, Herndon (VA)
Midwest:	Minneapolis
Southwest:	Austin
Mountain:	Temple
Pacific:	Cupertino, Irvine, San Francisco, San Luis Obispo, Seattle

Amazon may wish to recruit more contract employees because there is tenure flexibility based on production needs and the company can reduce risk by getting an opportunity to try out an employee to determine if they are a good fit before committing to hiring them.

Staffing agencies usually help organizations cut expensive hiring costs and create a candidate profile that engender better job candidates. There are legal issues to consider when considering staffing company employees including the possible misclassification of employees for tax purposes, compliance with labor law and federal laws, and possible contract disputes.

In addition to the considerations that arise with gig and contract workers, if more permanent future employees expect to have partial or full remote working capability in HQ2 facilities this has a significant impact on the extent of the construction.

If more employees will wish to work remotely, Amazon will want to accommodate the needs of the workforce and can save considerable expense in construction, rent, and utilities. Amazon can utilize the findings of this analysis to better decide how many facilities and the dimensions of the facilities needed to accommodate its onsite HQ2 personnel whether they be contract, gig, or permanent.

In addition to the construction and ongoing expenses related to urban workspaces, Amazon may wish to lead the effort to employ more gig and remote workers, to obtain other benefits. These benefits include access to a bigger talent pool not limited by geographical location, tapping into less inflated high salary job markets, and accessing remote workers who are generally happier and more productive.

If there is a significant trend to more flexible working options, HR will want to begin long-range planning. The planning could include hiring and training leaders that can effectively manage virtually with the right balance of autonomy and accountability, determining the best options for setting up high capacity remote systems connectivity, legal employee contact changes, and several other considerations.

C.) Data Sources:

Some of the initial data sources, which are subject to change, as the analysis progress are listed below:

- **Department of Labor**: Closely watched measures of employment and unemployment. https://www.dol.gov/
- **Employment by U.S. Census**: Data that measures the state of the nation's workforce, including employment and unemployment levels, as well as weeks and hours worked. https://www.census.gov/topics/employment.html
- **US Government Open Data**: United States open source software government site making data open and machine-readable on a variety of topics. https://www.data.gov/open-gov/
- **Bureau of Labor Statistics**: U.S. government's data collection of employment-related stats across regions, states, and local areas. https://www.bls.gov/opub/mlr/2018/article/electronically-mediated-work-new-questions-in-the-contingent-worker-supplement.htm
- **JP Morgan Chase Online Platform Economy in 2018**: JP Morgan Chase's evaluation of the global economy which provides gig economy findings https://www.jpmorganchase.com/corporate/institute/document/institute-ope-2018.pdf
- **MIT Technology Review**: MIT online article that addresses how the US Bureau of Labor Statistics is likely undercounting alternative work arrangement employees. https://www.technologyreview.com/s/611381/the-us-government-is-seriously-underestimating-how-much-americans-rely-on-gig-work/

D.) Approach:

The general approach to answering the 2029 United States gig and remote workers percentages questions are listed below.

1.) Obtain data on current gig and remote workers makeup. The goal is to gain a U.S employee multi-dimensional data set that includes the job classification, demographic factors, geographic factors, economic factors, plus the fraction of gig/remote workers.

2.) Gain an understanding if the trend is increasing or decreasing and by what percentages in the U.S.

a. Employ the statistical classification model to classify current employment data points into increases or decreases in gig and remote employment.
b. Employ the clustering classification model to group like employment data points into increases or decreases in gig and remote employment clustered by geographical region.
c. Employ multiple regression analysis models to estimate the relationship between employment data points to determine an upward or downward trend in gig and remote employment.

3.) If all three models (classification, clustering, and regression show a consistent upward or downward trend) gain an understanding of the factors behind the trend.

4.) Adjust the data points, using the factors behind the trend, to obtain new 2029 data points.

5.) Rank the potential U.S. future employment scenarios using cluster analysis.

6.) Apply trend analysis to update the estimates to get the final estimated impact by job type on the Amazon HQ2 hiring. This is the step where the analysis moves from U.S. analysis and become to become Amazon.com specific.

7.) Provide Amazon.com estimates of permanent, gig, and contract 2029 employees by occupations and geographical level.

8.) Build visualizations to illustrate the differences between both U.S. and Amazon.com employee data in 2019 and 2029 predicted data by geographic locations and occupations for proposed HQ2 locations.

E.) Deliverables:

The deliverables are below:

a.) Slide deck with the following:
   a. an understanding of the project.
   b. a summary of the original data points.
   c. classification, clustering, and regression analysis that produce predicted data points.
   d. estimated 2029 data points alongside 2019 data points with percentage differences.
b.) Any programming and data munging code.
c.) All data in a cleaned form that was used for analysis.
d.) Trained usable models that can be used to run future data through using another factor (i.e. GDP growth).

When the project is complete, the project can be listed on Data Science Central and LinkedIn to illustrate competency.

F.) Works Cited:

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