**Team VCU TUN Competition: Hire Heroes USA**

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# Summary

Our team set out to find out if there was a relationship between certain days of the week, times in the day, months, or time of the year when employers and job seekers create accounts. Using data provided, we cleaned and analyzed job seeker and employer data into three visualizations using Tableau and Microsoft Excel. We determined that there were was in fact a relationship between certain days of the week, times in the day, and times during the year where there were spikes in account creations in both job seekers and employers.

# Problem and Motivation

Hire Heroes is a service aimed at providing military veterans and their spouses with career placement and advising services. Founder, John Burdis, created the company in 2014 following an influential encounter with a wounded veteran in a VA hospital. The service was created to provide a one-to-one counselor relationship in order to produce the most personalized service possible. Clients of the service can use the closed job board, receive resume tips, participate in online workshops, and get mentoring from various industry leading volunteers.

Our goal in this report is to determine if there is a relationship between the time of day/week/month/year and the creation of new accounts of employers and veterans. By identifying this relationship we hope to empower Hire Heroes to better allocate their resources in a manner in which they can better serve their clients. The success of an organization like Hire Heroes means a lower unemployment rate and a healthier economy while providing a valuable service to veterans and their families.

In order to achieve our goal we analyzed extensive data made available on the Hire Heroes website and identified the most common times in which new job seeker and employer accounts were created. We did this by specifically focusing on the “job seeker profile” and “employer profile” data sets. During our analysis, the data had to be altered for us to better form our conclusions. Data that was deemed unnecessary for our purposes was removed while other data was converted into a more useful form.

As a result of our analysis it is our team’s recommendation that Hire Heroes focus their talent acquisition towards the middle of the week and midday. The data shows that most job seekers tend to set up accounts in the middle of the week, specifically the early afternoon. Employers also tend to set up their profiles later in the day. Account creation is consistent throughout the year with one major exception. January seems to be the ideal time to try and attract new job seekers. Advertising and resource allocation should be adjusted accordingly to maximize value for clients and commission for agents.

# Approach

In order to answer the question, we needed data to analyze. The data provided by Hire Heroes for the TUN competition was made available on the website. From the many files provided, we used two files: Job Seeker Profile Creation Report and Employer Profile Creation Report. The job seeker file contained information regarding the location a job seeker made an account, as well as the date and time that they made the account and the last time they logged in. The employer file contained information about the company ID, what date and time their account was created, how many jobs they had posted, and how they heard about Hire Heroes. Our first plan of action was to clean the Job Seeker Creation data of unnecessary columns. Then, we would separate accounts that registered and provided their state information from those who didn’t. Looking at accounts with states associated with them, we would group all of the states by their time zones. This was done because the data given in the Job Seeker Profile Creation Report was only recorded in Coordinated Universal Time (UTC) time for all entries. Our next plan of action was to clean the Employer Profile Creation Report of unnecessary columns. The data did not provide the location of the employers, so we could not transfer the UTC time to local time for that set of data. Lastly, we would look at and compare data between the two reports by different times, days, and months of the year.

# Tools and Analytics

To begin, we manipulated the data that was provided by TUN. These files were in Microsoft excel. We cleaned the job seeker file by deleting the “City” column as it was not necessary to our analysis. In the job seeker file, the date and time of creation of accounts are all logged in UTC. To further clean the data, we added a new column that categorized the states by the six different US time zones. We also had to format the data in the “date and time created” column into the time and date format in excel as the data was unformatted. This was important to do, as we have to manipulate that data to add or subtract the hours to adjust to local time zones. In excel we filtered the states by the time zones and adjusted the UTC time to their respective local time with an excel equation in a new column called “updated\_create\_date”. The equation used was = (UTC Time) - (Time Difference from UTC) / 24. We had to look up the time difference of each time zone online and manually type the hours in the “Time Difference from UTC” for each time zone.  Regarding the employer file, we could not use the same process as we used for the job seeker file to convert the UTC date. The location of each employer was not provided; therefore there was no way of distinguishing a local time. Due to this, we could only analyze the employer file as is. After cleaning the data, we began to use Tableau to analyze the data. We copied and pasted all the cleaned data into a new excel file consolidated into one sheet. This was done so we could visualize the data and categorize it by employers and job seekers. Finally, we imported the files into Tableau to create three different graphs that included: accounts made throughout the year, accounts made throughout the week, and accounts made throughout the day. These can be found in Appendix 1, 2, and 3.

# Results

Hire Heroes USA provided this data to be analyzed so that their resources could be better optimized and to create more value for themselves as well as their clients. Through our analysis of the provided data, we were able to compare the account creations of job seekers and employers. Even after accounting for time zones, there are clear correlations between when employers and job seekers create accounts. The first thing to note is the analysis of the months of the year when accounts are created. Appendix 1 shows many accounts made during the beginning of the year and a slight peak in the summer with very low counts near the end of the year. Going further in depth, we looked at when accounts were made over the course of an average week (Appendix 2). This graph shows a decrease in accounts made over the weekend and Friday as well as very high activity during the middle of the week. This makes sense in that businesses will be less likely to be in operation during the weekend and job seekers would be taking a break for their own time on the weekends. The peak midweek activity shows that job seekers and businesses are busy during the week being productive posting and applying for jobs. Lastly, we analyzed what time of the day accounts were created (Appendix 3). This graph shows what hour of the day accounts were created. This graph shows that employers create accounts during business hours and that job seekers create less accounts at night than they do at the peak time: the early afternoon / lunch time.

From these graphs, we recommend the business adjust their advertising towards job seekers and increase incentives to businesses posting jobs during the points of very high and low activity. In doing so, they could create value for the business partners by saving them money when they post a job. Hire Heroes charges certain rates depending on the job posting and they could advertise a discount if they post during lull periods. In regards to veterans, they can also cater their advertising during appropriate hours to get the attention of as many potential clients. During peak times, like January, the company can better reach many veterans. This is good for the business partners in that they get employees faster as well as receiving a larger tax cut for hiring veterans. In doing so, it benefits Hire Heroes agents who get a commission from each veteran helped. These proposed fixes capitalize on our findings and hopefully boost the businesses standing and optimize their use of resources.