

STRATEGIC JOB PLACEMENT SOLUTIONS FOR VETERANS USING DATA
ANALYTICS

By

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Abstract

The United States has a large population of military veterans and spouses who are experiencing difficulty transitioning from military life to civilian life. This particular population faces difficulties in finding jobs that are fitting to their work experience and personal needs. Headquartered in Georgia and North Carolina, Hire Heroes USA is a free, non-profit service that empowers United States military members, veterans and military spouses to succeed in the civilian workforce. Each Hire Heroes USA client works with a counselor discussing their individual needs such as location preferences, occupation, disabilities, and desired salary. The data sets provided by Hire Heroes USA provides insight into how the organization currently drives results. The data reveals key objectives which highlight diversity gaps, both racial and gender, how starting salaries correlate with ending military pay grade, and which geographic areas to focus on which have larger military populations. The analysis of the data results in recommendations for Hire Heroes USA to reach more clients and understand why certain individuals are not being placed into their desired industry. In addition to the Hire Heroes USA data, the analysis incorporates employment and industry statistics from a federal level. This provides more insight into why veterans and military spouses face more challenges regarding job placement than the rest of the population. With the insight provided from the Hire Heroes USA datasets, retired military and spouses will have a more enhanced experience finding jobs through the Hire Heroes USA database.

Keywords: veterans, job placement, data analysis, Gini, Hire Heroes USA, military, analytics, visualization

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CHAPTER 1: INTRODUCTION

Purpose

An individual's military experience, personal demographics and desires are key attributes that factor into finding a career when transitioning back to a civilian lifestyle. The qualitative data provided by Hire Heroes USA will provide effecting insight into how the organization can expand their resources, increase awareness, and increase overall job placement satisfaction. The purpose of this research is to increase general awareness surrounding the challenges that many veterans face in civilian job industries and provide data driven recommendations for Hire Heroes USA, as well as any career consulting organizations, to help them reach more clients in the most effective manner.

Methodology

This case study will use predictive, descriptive and prescriptive analytics that will result in data drive recommendations for Hire Heroes USA and the entire veteran population. The data collected by Hire Heroes USA and provided through Teradata University consists of data for 4,343 clients during the year of 2017. Additionally, federal data is used to understand more about the demographics and characteristics of veterans in the labor force. The quantitative data provided is used for measuring, ranking, categorizing and identifying patterns. Qualitative data transformed into quantitative data combined with the analysis of the existing quantitative data allows for an in-depth

exploration of job placement for veterans and spouses. The data is analyzed using Excel, Tableau and Python resulting in a complete written and visual analysis of the findings.

Hire Heroes USA

Hire Heroes USA was started by U.S. Army Sergeant Justin Callahan who was injured in Afghanistan. After returning home, his main challenge was finding employment. His experiences is what inspired U.S. Army Sergeant Justin Callahan to create Hire Heroes USA with the purpose to provide free job search support and counseling to U.S. military members, veterans and military spouses. Hire Heroes USA's mission is to empower, "U.S. military members, veterans and military spouses to succeed in the civilian workforce" (*Hire Heroes USA*, 2020). Hire Heroes USA continues to be one of the largest organizations that have helped thousands of individuals succeed in finding a career through resume building workshops, job specific training and even mock interviews. Some of their partners include Walmart, Men's Wearhouse, Boeing, and USAA.

Hire Heroes USA provides employment assistance through personalized support. Hire Hero USA's goal for career placement is not only to get an individual hired, but to make individuals happy with their job placement and retain the job. According to their website, they have revised over 65,000 resumes, confirmed hires for over 40,000 clients, and have created 15,000 jobs that are available for the clients through their partnerships with other companies (*Hire Heroes USA*, n.d.).

Through these services, Hire Heroes USA has managed to collect an ample amount of data which describes the client demographics, the jobs they seek and their overall success. The massive amounts of data have been collected via surveys and the

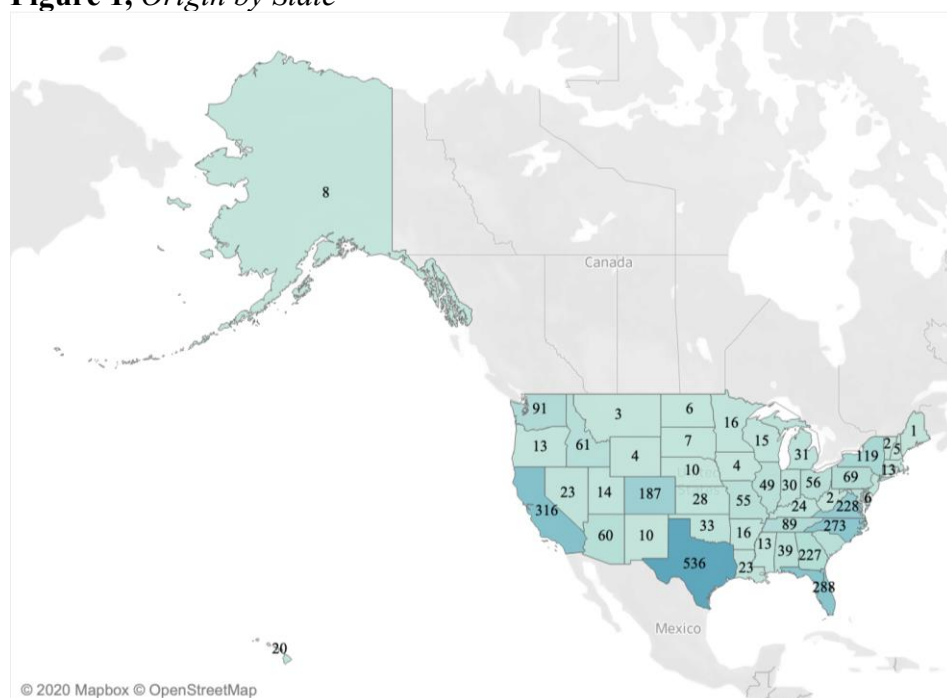
accounts that the clients have to track their progress. The data provided by Hire Heroes USA is extremely reliable due to the method of collection, the large number of variables considered, and the number of clients that are included in the data.

CHAPTER 2: GEOGRAPHIC ANALYSIS

Origin

Of the 4,343 clients reported in the 2017 data sets from Hire Heroes USA, 920 values were missing for reporting their origin. Figure 1 displays which states the clients are from. The majority of the job seekers reported that they are from Texas, California, Florida, North Carolina, Virginia or Georgia (*EPO_Teradata_Job-Seeker_Profile_Creation_Report*, 2017). These six states make up 54.58% of all location of job seekers. These states have the highest population of military veterans and spouses who are seeking career counseling services through Hire Heroes USA.

This indicates that Hire Heroes USA should focus on maximizing their resources in these states. Some possible opportunities for Hire Heroes would be to open a location in Texas or California. Additionally, the organization can focus on hosting workshops in these states. According to the U.S. Department of Veterans Affairs, California and Florida are the states with the largest population of military retirees (2019). The states with the least number of clients are from Maine, Rhode Island, Vermont, West Virginia, Montana and Iowa.

Figure 1, Origin by State

Largest Military Bases

The largest military bases are located in North Carolina, Kentucky, Texas, Washington and Georgia (*5 Largest U.S. Military Bases*, 2016). These locations of these military bases roughly reflect where the highest number of job seekers registered are from. The base population does not include those who are stationed there, but live in off base housing. This means that the actual population of individuals stationed at these locations is much higher than the numbers given. Luckily, Hire Heroes USA is headquartered in Georgia with offices in North Carolina and Washington. Hire Heroes USA should consider opening additional office locations in Texas and Kentucky.

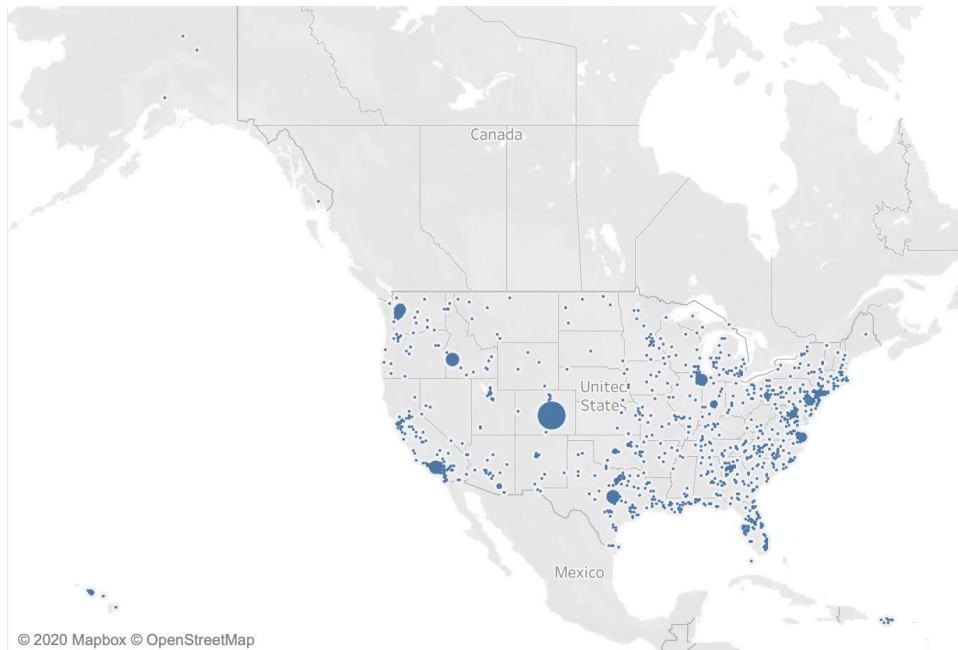
Desired Location of Employment

The top five most popular desired cities are the following; Colorado Springs, San Antonio, San Diego, Atlanta and Houston (*SalesForce_Contact*, 2017). These cities are aligned with where the largest bases are located as well as where most of the clients are

from. Additionally, Hire Heroes USA can utilize this knowledge by creating relationships with businesses in these cities to ensure that there are ample amounts of job opportunities available for clients in these highly desirable locations. The unemployment rates for these cities are considered lower compared to a healthy rate. The unemployment rate for the United States is currently 3.6% as of October 2019 (Rolen, 2017). The unemployment rate as of October 2019 for Colorado Springs is 2.8%, San Antonio is 2.9%, San Diego is 2.8%, Atlanta is 2.9%, and Houston is 3.5% (*Unemployment Rates for Metropolitan Areas*, 2019). However, this means that businesses and companies who are searching for employees may have a smaller applicant pool to select from considering most people in the labor force are already employed.

Looking at desired location with a broader perspective by analyzing regional desires, the data shows that most applicants want to be located in the Southeast region of the United States (*SalesForce_Contact*, 2017). Fort Bragg and Fort Benning are both located in the Southeast region of the United States and are large bases. By narrowing down where geographically clients want to be placed, Hire Heroes USA can focus on making partnerships with companies, corporations and businesses in those areas to ensure that there are opportunities available for clients in these locations. Additionally, Hire Heroes USA can analyze the other desires and needs that clients have based on their desired region of employment to generate the best plan for a client.

Figure 2, *Desired City of Employment*



Daily Commute

In the data, clients also stated how far that they are willing to commute to work on a daily basis. 43.24% of clients are willing to travel up to 30 miles to commute (*SalesForce_Contact*, 2017). This widens the amount of jobs that they can be placed in. Based off of the top five desired cities of employment, salary expectation of at least \$40,000 per year, or a full time job paid \$20 per hour, within a 25 mile radius of the desired city there are 2,460 jobs posted in Colorado Springs (*Employment in Colorado Springs, CO*, 2019). There are 6,895 in San Antonio (*Employment in San Antonio, TX*, 2019). A higher number of jobs available in San Diego at 11,628 (*Employment in San Diego, CA*, 2019). 21,188 jobs posted in Atlanta (*Employment in Atlanta, GA*, 2019). And finally, 21,152 jobs posted in Houston (*Employment in Houston, TX*, 2019).

CHAPTER 3: INDUSTRY ANALYSIS

Desired Industry

During the job search process, Hire Heroes USA clients are required to narrow down which industry they would like to work in when creating their Hire Heroes USA profile. Majority of clients do not have a preference, as they chose “All” as their desired industry (*SalesForce_Contact*, 2017). This indicates that many do not know what they want to do necessarily, so Hire Heroes USA should find a way to help clients define what they want for a career. While not knowing which industry is desired may seem too ambiguous to be helpful for job placement services, it also means that these clients are open to a wide variety of jobs. This helps to broaden the search and the number of possible opportunities for these clients.

Otherwise, majority of the clients want to work with information technology, business administration, government jobs, transportation and health care. Luckily, many jobs in these industries value military experience and can help clients land a higher paid position. The most recent data shows that as of October 2019, information technology in the United States has 129,000 job openings with an average annual salary of \$87,963 assuming one is working 40 hours per week (*Industries at a Glance*, 2019b). However, the health care and social assistance industry has a much higher number of job openings available with 1,184,000 job openings as of October 2019 (*Industries at a Glance*, 2019a).

Hire Heroes USA should also determine how non-negotiable the desired industry is for a client. Some clients may be stating that they want to be employed in the information technology industry, but would also enjoy working in business support or administration. A helpful attribute to be recorded for the future would be the clients top two desired industries. This will ensure that more clients are being placed in industries that they desire. For example, if there are not enough job opportunities for a specific client in the information technology industry, the career counselor should be aware of their second most desired industry to ensure that the client is satisfied in the end.

Industry and Position Hired In

The top industries that clients were hired in are government and public administration, defense contracting, information technology, health care and social assistance (*SalesForce_Contact*, 2017). The job industries that clients are hired in reflects their desired industry which is attractive to possible clients who want to see the effectiveness of Hire Heroes USA's job placement services. Additionally, this information can be used as a marketing tool to attract more clients. In addition to the industry hired in, the data also has records of which positions clients are hired for. The top positions that clients are hired in are project managers, operations managers and program managers (*SalesForce_Contact*, 2017). The top three positions hired for are considered to be management positions. Management positions are expected to grow 7% over the next ten years, which will bring about 706,900 new jobs. Additionally, the median annual wage for this position was \$104,240 as of May of 2018 (*Management Occupations*, 2019).

Salary Expectations

When searching for a job, every individual has an expectation for their salary or wage. For the clients of Hire Heroes USA, almost 50% state that they have an expected and desired salary of \$40,000-\$59,999 (*SalesForce_Contact*, 2017). According to the United States Census Bureau, the median salary for an individual in the United States is \$40,247 as of 2018 (Jessica Semega et al., 2019). This roughly indicates that there is a 50% chance that an individual will be earning more than the United States median salary as of 2018, which is also parallel with the salary desires of clients of Hire Heroes USA. This means that Hire Heroes USA does not have to go above and beyond in attempts to find jobs that provide salaries that are much higher than the median expectations.

CHAPTER 4: CLIENT ANALYSIS

Service Branch and Pay Grade

Majority of the clients of Hire Heroes USA served in the army and navy branches of the military. (*SalesForce_Contact*, 2017). This is due to the fact that the number of individuals serving is highest in the army. Clients also recorded what their most recent rank is or was. Most of Hire Heroes USA clients are coming from an enlisted pay grade rank (*SalesForce_Contact*, 2017). Unlike officers, those who are enlisted are not required to have previously earned a bachelor's degree. This means that not all of those with an enlisted ranking have a college degree. If majority of clients were coming from an officer rank, it would also assume that majority of clients have a college degree. Assuming at least two years of service an E-5 pay grade rank would make \$30,657 per year and an E-4 pay grade rank would make \$27,684 per year (*Archived Military Pay Tables*, n.d.). This means that majority of clients are making about \$30,000 while enlisted, yet expect a minimum salary of over \$40,000. Additionally, only 8.3% of enlisted members hold either a bachelor's degree or an advanced degree. 80.6% of enlisted members have a high school diploma or some college as their highest level of education (*2017 Demographics: Profile of the Military Community*, 2017). According to Elka Torpey, those with some college, but no degree earns \$40,248 per year, assuming the individual works every single week in the year. However, those with a bachelor's degree earn \$60,996 per year (2018). Having this knowledge available, Hire Heroes USA must make an effort to find

job opportunities that exceed the median yearly earnings for certain job positions and industries. This way, the clients are satisfied by earning their desired minimum salary.

Gender

Only 16.2% of active duty members are female (*2017 Demographics: Profile of the Military Community*, 2017). 23.84% of clients from Hire Heroes USA are female, while the remaining 76.16% are male. This shows a large gender gap. There is a higher percentage of females seeking assistance for job placement compared to the percentage of active duty members that are female. Hire Heroes USA should ensure that they are finding companies that are focused on gender equality to ensure that there are enough job opportunities for the female Hire Heroes USA clients.

According to the United States Bureau of Labor Statistics, the top industries for male veterans are the following; management occupations (14.9%), transportation and material moving occupations (11.1%), sales and related occupations (8.9%), installation, maintenance and repair occupations (7.8%) and protective service occupations (7.3%). For female veterans, their top industries are the following; office and administrative support occupations (19.3%), healthcare practitioners and technical occupations (13.6%), management occupations (10.5%), business and financial operations occupations (8.7%) and sales and related occupations (8.4%) (Rolen, 2017).

The top industry that males are placed in are management positions which are expected to grow 7% over the next ten years, which will bring about 706,900 new jobs. Additionally, the median annual wage for this position was \$104,240 as of May of 2018 (*Management Occupations*, 2019). While the top industry that female veterans are placed in are office and administrative support occupations which is projected to decline 3 percent over the

next ten years which results in a loss of 608,100 jobs. Additionally, the median annual salary for this industry is only \$35,760 which is below the minimum expected salary (*Office and Administrative Support Occupations*, 2019).

Disability Rating

Hire Heroes USA clients also report their personal rating of how disabled they are in increments of 10%. 57.39% of clients are not disabled, while 5.59% of clients are 100% disabled (*SalesForce_Contact*, 2017). Hire Heroes USA needs to take these numbers into account and ensure that they have a certain percentage of jobs that are disability-friendly. While there are disability laws in place to ensure equality, there are still certain jobs that would be better for a certain state of disability compared to other states of disability. According to the United States Bureau of Labor Statistics, the unemployment rate for those with a service connected disability is 4.8% which is only .1% higher than the unemployment rate for those without a service connected disability (*Employment Situation of Veterans*, 2017). According to the same report, “31 percent of employed veterans with a disability worked in a federal, state, or local government, compared with 19 percent of veterans with no disability and 13 percent of nonveterans. In particular, 20 percent of employed veterans with a disability worked for the federal government, compared with 7 percent of veterans with no disability and 2 percent of nonveterans” (*Employment Situation of Veterans*, 2017).

Purple Heart Recipient

The Purple Heart is awarded for being injured or killed in a military mission against an enemy or in a combat zone. There are an estimated 1.8 million awarded with a purple heart (Military.com, 2019a). Only 4.15% of Hire Heroes USA’s clients are a purple heart

recipient (*SalesForce_Contact*, 2017). Those who are recipients of the Purple Heart award also are given extra benefits. One of them includes hiring preference for federal jobs (Military.com, 2019). Despite being a purple heart recipient, those with this award still have the same minimum salary expectation of \$40,000-\$59,999 as the rest of Hire Heroes USA's clients.

CHAPTER 5: EFFECTIVE COMMUNICATION ANALYSIS

Preferred Contact Time

Majority of clients prefer to be contacted between 7:00 A.M. and 10:00 A.M. with 9:00 A.M. being the most preferred time to contact them. Additionally, 78.26% of clients preferred to be contacted via phone call and 20.87% to be contacted through email (*SalesForce_Contact*, 2017). Hire Heroes USA should utilize this information by ensuring that their employees are available during these hours to contact clients and potential clients. If Hire Heroes USA's job counselors and employees are not contacting their clients during these times, then they are declining the client's overall satisfaction with Hire Heroes USA's offered services.

Marketing Tools

Most clients discovered Hire Heroes USA through word of mouth, Hire Heroes USA website and their military installation (*SalesForce_Contact*, 2017). This is financially positive news for Hire Heroes USA as word of mouth is a free tool to spread awareness about the services that Hire Heroes USA has to offer. Hire Heroes USA needs to take advantage of the knowledge this data provides. Not shown in the figure is the very low percentage of people who find discover Hire Heroes USA through Instagram. Using social media such as LinkedIn, Facebook and Instagram as a marketing tool is such a powerful tool in this modern age of technology. According to Gil Appel, Lauren Grewal, Rhonda Hadi, and Andrew Stephen, "social media allows people to freely interact with

others and offers multiple ways for marketers to reach and engage with consumers" (Appel et al., 2020, p. 79). Social media platforms are predicted to have a rise of influencers and integrated customer care in the near future. Hire Heroes USA can capitalize on the rise of customer care on social media, which will also allow them to collect even more data and possibly create predictive models to provide solutions to customers' problems. Hire Heroes USA can expand awareness of their existence and connect on a personal level with clients by utilizing the rapidly growing power of social media.

CHAPTER 6: GINI ANALYSIS

Occupational inequality is driven from the apparent differences between individuals that others may believe makes someone inferior from someone else. Some examples of occupation inequality can be gender, social class, race, and disability. The Gini coefficient can be used to measure inequality in the data from Hire Heroes, such as occupational inequality. A test data set from Hire Heroes USA of 2,367 records was used to determine if gender and disability rating prove to drive inequality for individuals based on if they were hired in their desired industry or not.

Of the 2,367 records, 1,300 individuals were hired in a job of their desired industry. Gender proved to be more influential than disability rating, but not by enough to be considered a significant amount. Of the 547 females in the test data set 56.6% were hired in their desired job industry with a Gini average of 0.4910. Of the 1,820 males in the test data set, 54.4% were hired in their desired job industry with a Gini average of 0.4961. This shows that there is not a high level of inequality between gender and if a client of Hire Heroes USA will get hired in their desired industry.

Table 1
Gini Analysis with Root = Gender

Result	Female ($n = 547$)	Male ($n = 1820$)
Placed in Desired Industry	56.6%	54.4%
Not Placed in Desired Industry	43.4%	45.6%
Gini	0.4910	0.4961

Note. Gini = 0.4951, Gini Average = 0.4936

In the test data set, 1,465 of clients reported that they are not disabled at all. 57.3% of those who are not disabled were placed in their desired job industry with a Gini average of 0.4892. Those who rated themselves between 10% to 60% disabled are placed in their desired job industry at about a 49.4% rate with a Gini average of 0.4998. Those who rated themselves between 70% to 90% disabled are placed in their desired job industry at a rate of 52.5% with a Gini average of 0.4987. While those who are not disabled have a higher percentage of getting placed in their desired job industry, those who are 100% disabled reportedly get placed in their desired job industry 54.2% of the time with a Gini average of 0.4964.

Table 2
Gini Analysis with Root = Disability Rating

Result	0% (<i>n</i> = 1465)	10-30% (<i>n</i> = 246)	40-60% (<i>n</i> = 238)	70-90% (<i>n</i> = 335)	100% (<i>n</i> = 83)
Placed in Desired Industry	57.3%	49.2%	49.5%	52.5%	54.2%
Not Placed in Desired Industry	42.6%	50.8%	50.5%	47.5%	45.8%
Gini	0.4892	0.4998	0.4999	0.4987	0.4964

Note. Gini = 0.4951, Gini Average = 0.4968

In order to make the analysis more effective and concise, the data was broken down and categorized by the top eight desired industries. The top eight desired industries are the following; business support, government and public administration, health care and social assistance, information technology, installation / repair / maintenance, management, private security and transportation / warehousing. The desired job industry is the most influential characteristic that attributes to if an individual gets placed in their desired job industry or not. Individuals who desired to be placed in the management industry only received their desired industry 22.3%. The only other desired job industry

that does not place well is business support with only 35.7% of clients who desired that industry being placed into it. The job industries with the highest percentage of clients being placed in their desired job industry are health care and social assistance with 70.5% and information technology with 71.0%. The other job industries have about a 50% success with placing clients into their desired job industry.

Table 3
Gini Analysis with Root = Desired Industry

Desired Industry	Placed in Desired Industry	Not Placed in Desired Industry	Gini
Business Support (<i>n</i> = 408)	35.7%	64.3%	0.4595
Government and Public Administration (<i>n</i> = 335)	52.5%	47.5%	0.4987
Health Care and Social Assistance (<i>n</i> = 346)	70.5%	29.5%	0.4157
Information Technology (<i>n</i> = 532)	71.0%	29%	0.4113
Installation / Repair / Maintenance (<i>n</i> = 95)	50.5%	49.5%	0.4999
Management (<i>n</i> = 157)	22.3%	77.7%	0.3464
Private Security (<i>n</i> = 149)	49.8%	50.2%	0.4988
Transportation and Warehousing (<i>n</i> = 345)	49.1%	50.9%	0.4914

Note. Gini = 0.4951, Gini Average = 0.4527

With this information, Hire Heroes USA must recognize that certain job industries are not resulting in clients being placed into their desired industry. Hire Heroes USA must actively work on finding business or companies that are affiliated with job industries such as management and business support and form relationships with them in order to provide more of those opportunities for clients.

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