AN IN-DEPTH ANALYSIS OF THE BUSINESS OPERATIONS OF G.I. JUNK REMOVAL

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Submitted by:

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Executive Summary

This report provides an overview of the project's previous iteration conducted for GI Junk, focusing on the background, key findings, and proposed strategies. The project aimed to analyze various aspects of GI Junk's operations to identify revenue expansion and cost reduction opportunities, specifically focusing on customer acquisition and retention, employee productivity and compensation, and fleet movement.

The project's initial phase involved conducting an exploratory data analysis, revealing that the revenue per repeat customer was higher than new customers. The analysis also highlighted that a significant portion of costs was attributed to the cost of goods sold (COGS) and a large proportion of total revenue was spent on employee costs.

After discussing with the GI Junk team, two key areas were identified for analysis: customer acquisition and retention and employee productivity and compensation. The team analyzed junk description data from potential customers to identify specific age groups and their related quotes. The analysis revealed that the elderly and kids had higher average revenue per job, and strategies were proposed to target these demographics and enhance marketing efforts in cities with high average revenue and a significant elderly population.

The analysis of GI Junk's call volume revealed insights into client types, inbound and outbound calls, and trends in customer interaction. By leveraging automated messaging systems for order confirmation and reducing the number of calls made for confirming details, GI Junk can improve customer acquisition and retention, leading to cost savings and enhanced customer satisfaction.

Employee compensation, efficiency, and promotion were also analyzed to determine fair and efficient compensation systems that align with employee performance. Factors influencing crew incentivization, the relationship between employee compensation and efficiency, and recalibrating compensation based on efficiency scores were examined. Strategies were proposed to provide training for new crew members, optimize workflows, and implement incentivization programs to retain experienced employees.

Finally, the movement of GI Junk's fleet was investigated to optimize scheduling and routing. The project identified the need to consider additional factors beyond appointment times to improve fleet movement efficiency and reduce costs.

In conclusion, the project's previous iteration provided valuable insights into various aspects of GI Junk's operations. The proposed strategies aim to enhance customer acquisition and retention, improve employee efficiency and compensation, and optimize fleet movement. Implementing these strategies can contribute to revenue expansion and cost reduction, ultimately increasing GI Junk's profitability.

Background and Summary of Previous Iterations

The initial phase of the project involved conducting exploratory data analysis of the data provided by GI Junk. The team uncovered that the revenue per repeat customer was higher than that of new customers, and the revenue per client and job remained consistent across the different cities. In addition, the conversion rate was highest on GI Junk's website, followed by Google. However, a significant proportion (75-80%) of the costs incurred by GI Junk over the years was attributable to the cost of goods sold (COGS), and a large proportion of the total revenue was spent on employee costs.

Based on discussions with the GI Junk team, the team identified two key areas for deeper analysis: customer acquisition and retention and employee productivity and compensation.

By delving deeper into these areas, the team aims to discover strategies that will assist GI Junk in improving its customer acquisition and retention efforts while enhancing employee productivity, ultimately resulting in increased profitability.

Objectives

The objective of the project is to comprehend all the data related to GI Junk and pinpoint patterns and possibilities that could enhance the company's outcomes. Over the course of the project, the team examined two major business prospects for GI Junk:

1. Revenue Expansion

2. Cost Reduction

1. Analysis of Junk Quotes and Potential Expansion Areas

1.1 Junk Description Analysis

To obtain direct insights into customers' needs and the potential market, we analyzed the Junk Description provided by potential customers who completed the quote form on GI Website. Among the 1320 quotes, we paid particular attention to texts that contained specific customer indications. For instance, if the quote included terms such as 'crib', 'swing', and 'baby', it was indicative that the residence had child-related items to dispose of. On the other hand, if the quote mentioned 'senior', 'passed away', or 'retired', it was likely that the junk was from an elderly individual.

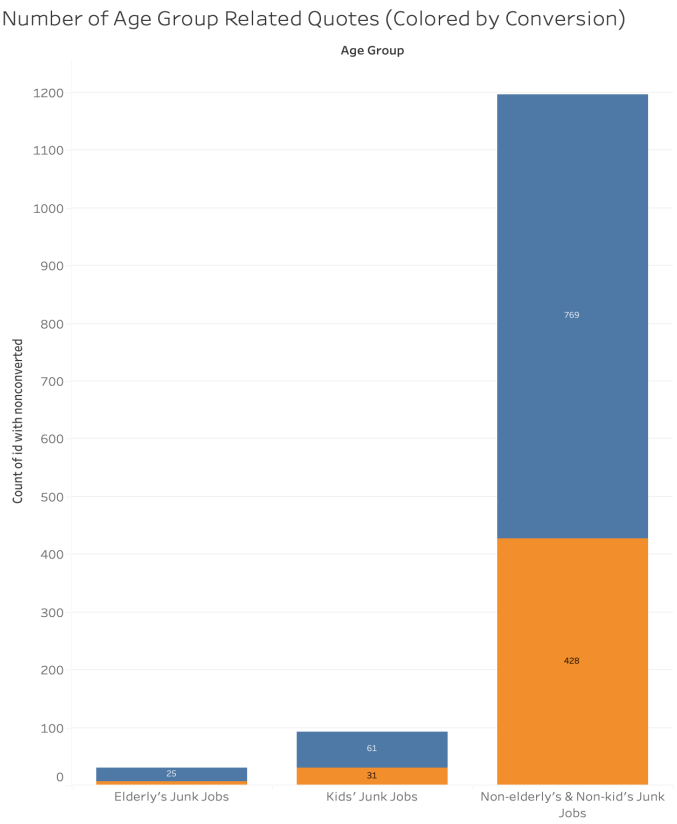

Figure 1: Age Group Related Quotes

To analyze the demand for junk removal for the elderly and kids', we created two lists of words to filter the related texts out:

- elderly: ["mom", "dad",'parent','parents','father','mother','aging','69 y/o','medical conditions','senior citizens','senior','retired','retire','retiree','assisted living','die','grandpa','grandparents','old folks','family house','retiree','hospital','passed','senior residence', 'elderly']
- 'kids'=['kid','daughter','son','baby','toy','crib','play structure','trampoline','children','toddler','kiddie','daycare','swing','child','slide','play']

The number of quotes from elderly customers may not appear significant due to excluding the keyword "old" from the analysis. Although "old" is a significant keyword, it is often associated with items such as "old furniture," "old chair," and "old mattress," which could potentially skew the data analysis and lead to inaccurate results.

We also manually checked the text to ensure the quotes were relevant to the intended age group and removed any erroneously captured rows. Our efforts yielded 31 quotes related to older people (which represents 2.4% of the total number of quotes) and 92 quotes related to kids (which represents 7%). Six of the 31 quotes related to older people were successfully

converted into jobs, generating $10692 in revenue (equivalent to 5.3% of the total revenue generated in 2022). Of the 92 quotes related to kids, 31 were successfully converted into jobs, generating $15909 in revenue (equivalent to 7.9% of the total revenue generated in 2022). However, for this analysis, we prioritized the total number of leads received over the number of jobs converted since our goal was to expand the business. Therefore, customers who had already converted were already part of the system.

By examining the average revenue per job among different age groups, it becomes apparent that older individuals and children tend to have higher average revenue per job for their "junk jobs." However, it's worth noting that the older group's high revenue per job is largely due to a single outlier job that generated $8654 in revenue (If we exclude this outlier, the Average Revenue of the Elderly is $408). This particular job involved cleaning up a hoarder's house, estate, basement, and garage - a challenging two-day project that stands out as the highest-earning job among all those quoted online in 2022.

We can conceptualize that numerous houses contain the belongings of deceased seniors, who often live far away from their relatives. When these seniors pass away, it can be a highly emotional experience for their loved ones to clear out their homes. In such situations, outsourcing junk removal services can be a viable option. If GI Junk targets this particular demographic, it will gain more customers and potentially lucrative contracts.

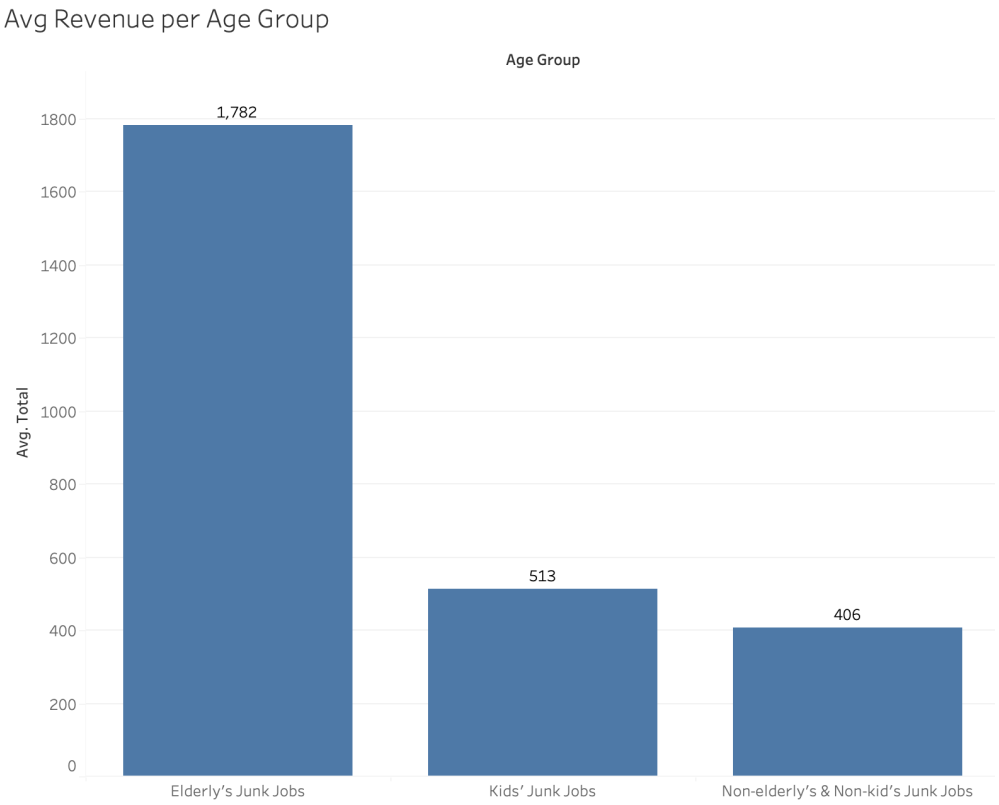

Figure 2: Average Revenue per Age Group

Text	Total
Dads house. Estate/hoarder clean up. House. Basement. Garage	8654
Hello, We are clearing out a garage for my father, retired Airforce. We have a fridge, a couple miscellaneous furniture items (dresser, end table, couch cushion..	733.5
1. 19 sheets of drywall 2. Patio sectional, just the wood frame 3. We have several Bins of old charts from a retired chiropractor. Not sure if you guys can shred..	400
Large heavy couch, matching chair, singer sewing machine in a cabinet, grandfather clock	349
Senior citizens (old) need help removing broken electric fireplace out of portable wooden mantel. Less than an hour...be nice to put a new one in it. Looking for..	180

Figure 3: Elderly's Junk Job Descriptions and Total Revenue per Job

1.2 Revenue Analysis: Targeting Expansion in Oregon's Top Cities

From the outset, the team approached two critical aspects of GI Junk's operations from various perspectives: revenue expansion and cost reduction. This report section outlines the team's primary objective of devising effective strategies to augment revenue generation by focusing on specific demographics and geographic locations. In addition, the team aimed to uncover unexplored opportunities for growth by investigating the cities in Oregon that exhibited the highest average revenue.

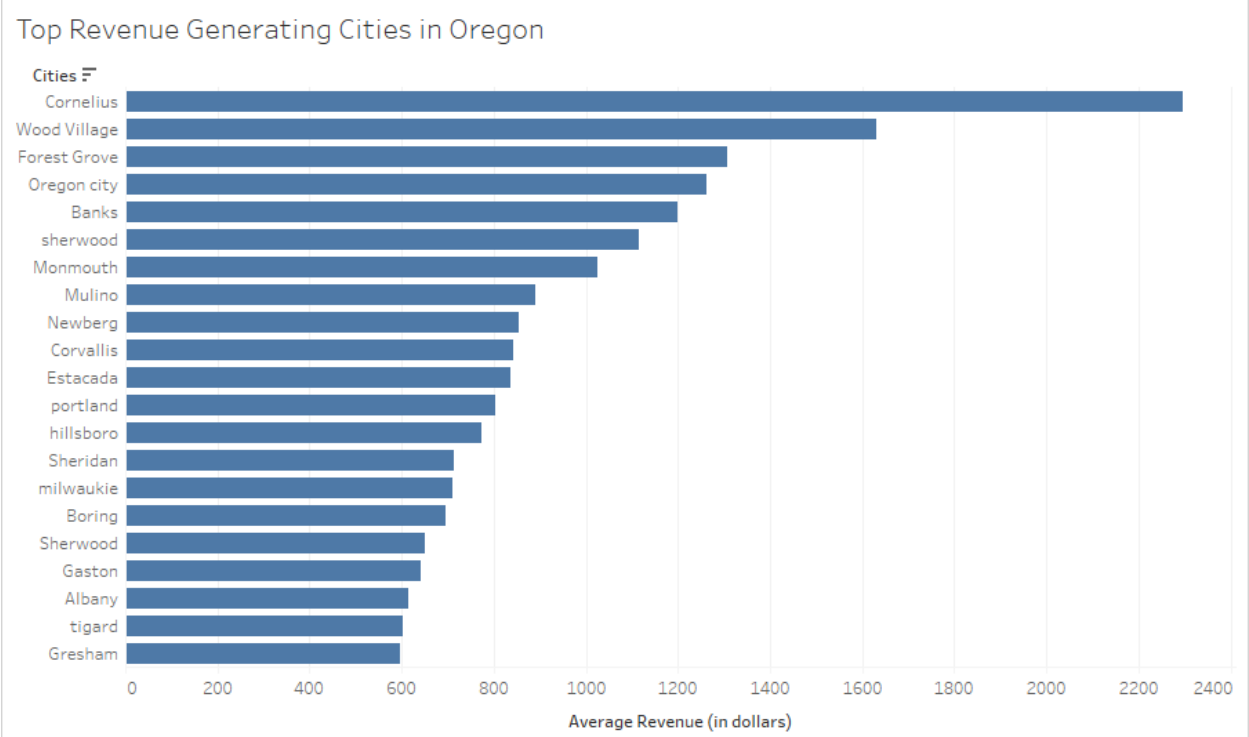

Figure 4: Top Average Revenue Generating Cities in Oregon

As a part of the analysis, the team also examined the "Leads" sheet to identify patterns concerning the requested services. After manually scanning the comments section, the team discovered a surge in demand for services catering to the elderly and kids. To support the findings with data, the team employed a Python code and fed it with relevant keywords such as "elderly," "grandparents," and "aged" to identify service requests for elderly people,

and "crib," "baby," and "toys" to pinpoint service requests for kids. The team's analysis revealed that the requests for elderly people accounted for 2.4% of the total requests, while requests for kids comprised 7%. Although these figures are not notably high, they provide valuable insights into the specific services requested and the corresponding age group.

Further analysis of the jobs that converted from leads revealed that although the number of jobs for elderly people was not substantial, the average revenue generated per job was significantly higher than that for kids. The team hypothesized that the service might have been requested for parents, who either moved to nursing homes, passed away, or moved with their kids leaving a substantial amount of junk to be removed. This finding prompted the team to investigate the correlation between cities with high elderly populations and those generating good average revenue.

The team conducted a comprehensive analysis using a combination of data analytics and machine learning techniques to sift through an array of data points and identify the top 20 cities in Oregon that not only had a sizable elderly population but also generated the highest average revenue. After examining various factors, the team identified three cities, namely Portland, Corvallis, Tigard, and Milwaukie, that stood out due to their high average revenue per job and significant elderly population. As a result, it would be wise for GI Junk to prioritize marketing efforts in these cities and cater to the needs of the aging population and their offspring, who require assistance in managing their belongings. Furthermore, by capitalizing on these findings, GI Junk could gain a competitive edge and increase its revenue stream.

To increase revenue and attract more customers in areas with a higher elderly population, GI Junk can implement various marketing tactics. One strategy, advertising in local senior-oriented publications, could also help reach this demographic, encouraging them to use the company's services and fostering brand loyalty. Secondly, many cities and towns host events specifically for seniors, such as health fairs and senior centre events. Consider attending these events and setting up a booth to promote the services. Thirdly, offer referral discounts to current customers who refer new senior customers to your junk removal services. Word of mouth can be a powerful tool among seniors because they rely more on recommendations from friends and family than other forms of advertising or marketing. Lastly, offer free consultations as seniors may hesitate to use junk removal services if unsure about the cost or process. Offering free consultations can be a great way to alleviate their concerns and show them the value of your services. During the consultation, you can assess the amount of junk that needs to be removed and provide an estimate for the job.

2. GI Junk Call Volume Analysis

2.1 GI Junk Calls by Client Type

It was observed that a large number of new and existing clients of GI Junk call the firm concerning placing new orders, quote inquiries, junk removal services, etc. The firm received 6279 calls from clients in the time period: 2021-2022. Of the 6279 clients calling GI Junk's customer service, 52% of customers proceed with a job while 48% do not proceed with the job. Figure 5 below exhibits the breakdown of GI Junk calls by client type.

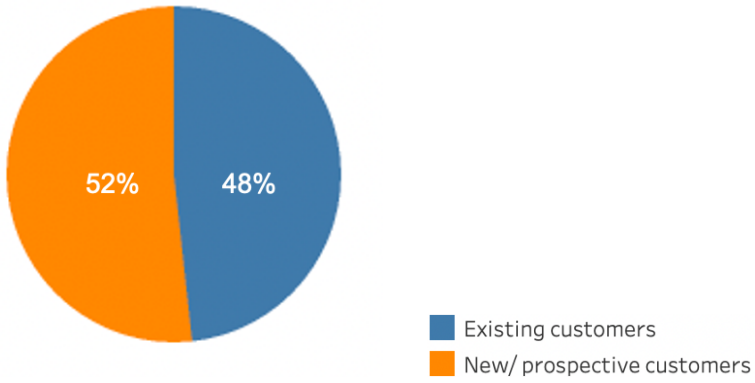

Figure 5: Breakdown of GI Junk Calls by Client Type

2.2 Analyzing the Calls made by New/Prospective Clients

On further analyzing the calls made by new clients who did not proceed with any job, it was observed that, on average, these customers called GI Junk ~ 1.3 times. Thus, the GI Junk team would be limited to 1 call to convert a caller into a client. Figure 6 below shows the total number of calls made by customers. This is only a snapshot of the longer list.

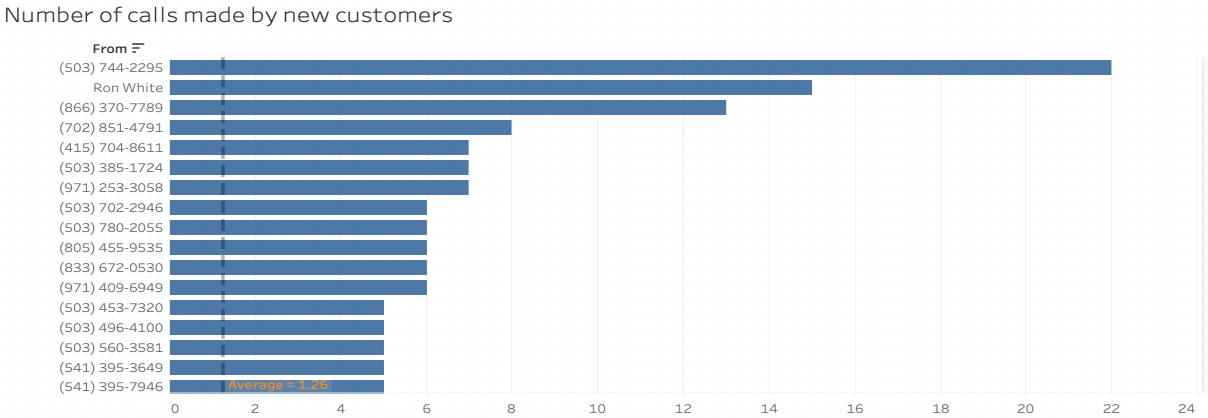

Figure 6: Number of calls made by New/Prospective Clients to GI Junk

It is also seen that a significant number of calls are made by new/prospective customers over Mondays and Tuesdays between 9:00am and 12:00 pm.

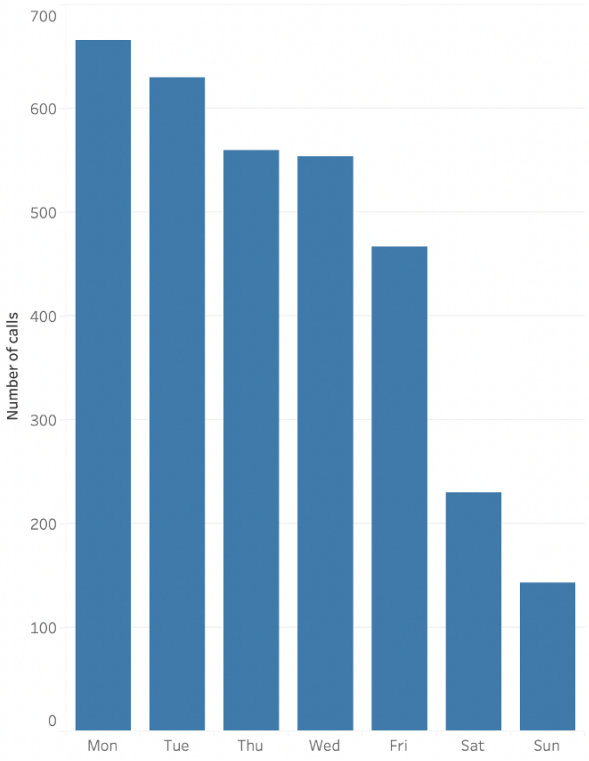

Figure 7: Distribution of Calls by New Customers Over the Week

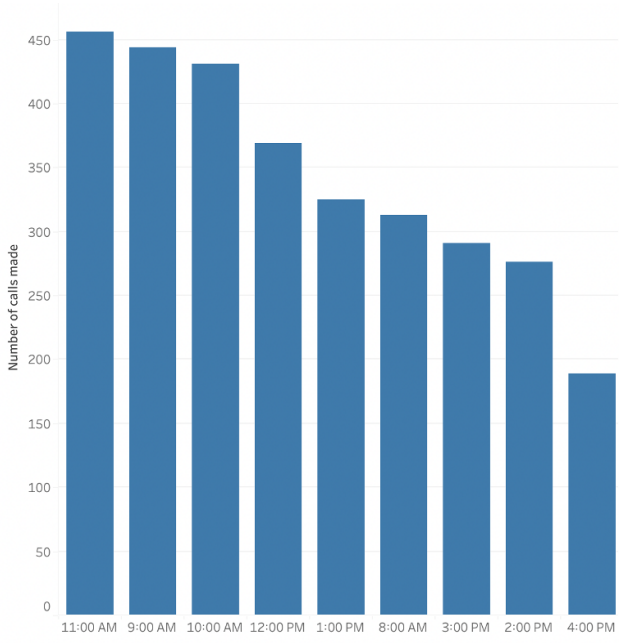

Figure 8: Distribution of Calls by New Customers by Time of the Day

2.3 Analyzing Outbound Calls made by GI Junk

An analysis of the calls made by GI Junk to the client provides us with some interesting insights. It is seen that most of these outbound calls by GI Junk are aimed at confirming the details pertaining to the location or with respect to the job to be covered. Figure 9 below shows that about 57% of the total calls made by GI Junk to the clients placing jobs are made after the job is placed and before it is completed. 43% of the calls are placed before the job gets created or after the job is completed.

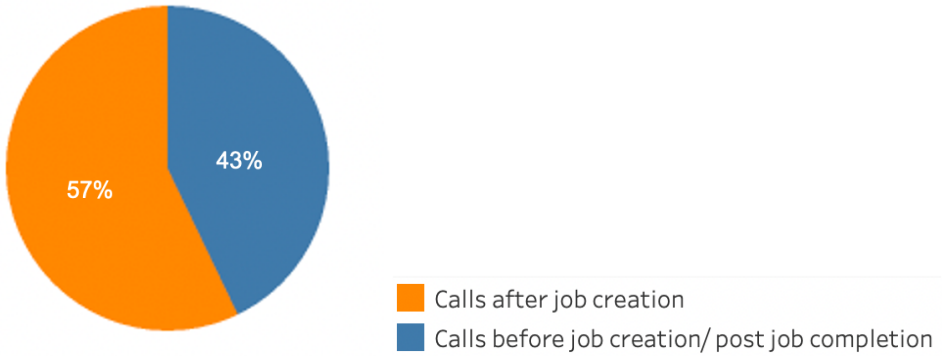

Figure 9: Breakdown of Calls made by GI Junk to the Client

Based on the above charts, it is seen that, while on one end, we do see multiple prospective customers trying to get in touch with GI Junk for scheduling jobs, on the other end, we also see a significant number of calls being made by the GI Junk team to confirm jobs that existing customers have scheduled. This shows that a significant improvement in customer acquisition and retention can be attained if the time and the number of calls made towards confirming job details are diverted towards acquiring new customers as well as retaining existing customers. Therefore, we propose that the GI Junk team leverages an automated messaging system that can replace the current set of calls made by the GI Junk team for order confirmations. Moreover, reducing the number of calls made to clients to confirm details will also help improve customer satisfaction. This would provide the GI Junk customer service team additional time to make outbound marketing calls, reducing the cost incurred in customer acquisition activities.

3. Employee Compensation, Efficiency and Promotion Analysis

3.1 Understanding the Factors Influencing Crew Incentivization

The compensation of employees is a crucial topic that raises questions about how it is determined and if it accurately reflects the efficiency and job quality of crew members. However, before we delve into the efficiency aspect, we must acknowledge that the high

turnover rate has primarily associated crew member compensation with two factors at GI Junk.

Firstly, the month when the crew member joined GI Junk is a critical determinant of their hourly job compensation, as labor costs in the US have increased in 2021 and 2022. Furthermore, a linear relationship exists between the start date of the crew member and their hourly rate, making it illogical to compare the compensation of two employees hired at different times.

Secondly, driving and non-driving crew members have different hourly rates, with the former earning $2 more per hour on average, even when their hire dates are the same. Therefore, to ensure a fair comparison, it is crucial to evaluate compensation and efficiency within the same type of crew instead of combining them.

Overall, understanding the factors that determine crew member compensation is essential for creating a fair and efficient compensation system that reflects each employee's value to the organization. Figure 10 below exhibits the trend in employee compensation over time.

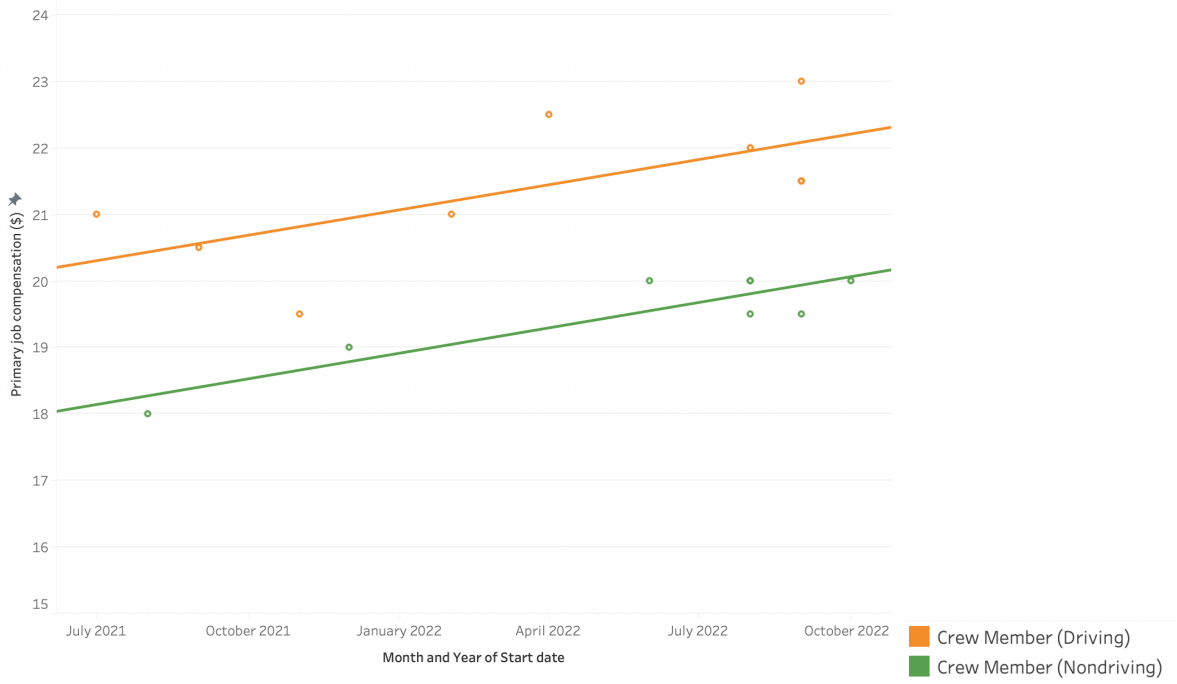

Figure 10: Trend in Employee Compensation over Time

3.2 Understanding the Relation Between Employee Compensation and Employee Efficiency

Given GI Junk's high turnover rate, the team looked to understand if experience or tenure time positively influences employee efficiency and whether GI Junk needs to provide additional compensation to retain experienced crew members.

Efficiency is calculated by dividing each crew member's revenue by their work duration. The data analysis reveals that crew members with 3-6 months of experience had the least efficiency. In contrast, those with 6-12 months of experience had the highest efficiency. However, the efficiency of the crew begins to decline after 12 months. Figure 11 below compares employee efficiency and employee experience.

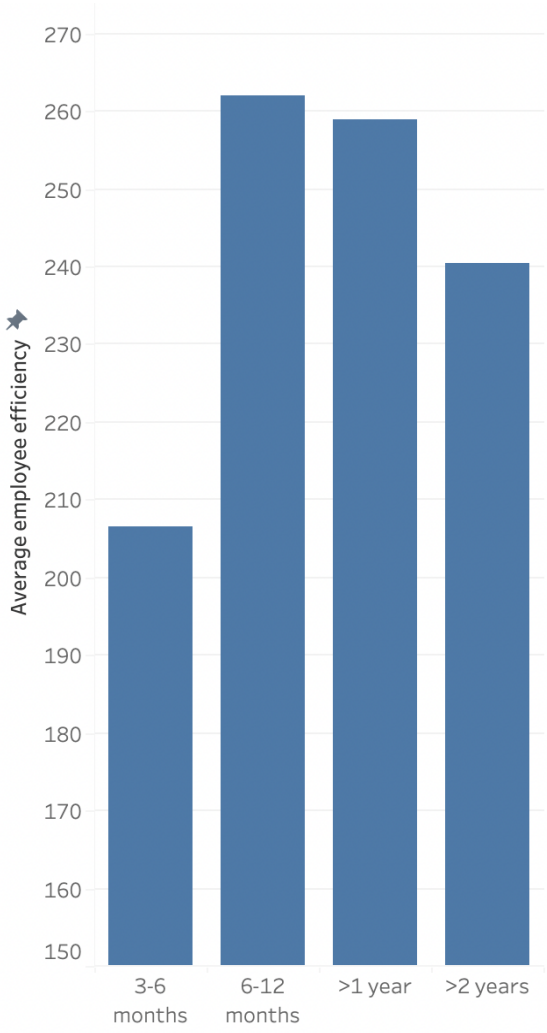

Figure 11: Comparing Employee Efficiency across Different Employee Tenures

This indicates that experience alone does not necessarily equate to higher efficiency. It may also be an indication that offering higher compensation to retain experienced crew members after one year of hiring may only sometimes work.

GI Junk could benefit from employee training, optimized workflows for new crew members, and a robust incentivization program for experienced crew members. Providing adequate training to new crew members can help them get up to speed quickly and become more efficient, which can benefit the company in the long run. Similarly, optimizing workflows can help reduce wasted time and effort, improving efficiency.

At the same time, experienced crew members can be incentivized through a combination of monetary and non-monetary reward programs, encouraging them to continue to perform at a high level. This can help ensure the company retains its most valuable employees, reducing the overall turnover. Implementing such strategies could improve efficiency and reduce GI Junk's costs, making it a worthwhile investment in the long run.

3.3 Recalibrating Employee Compensation based on Efficiency Score

To determine which crew members to promote within the same hierarchy, an efficiency score can be a useful tool. At the end of 2022, the team analyzed the performance of driving and non-driving crew members at GI Junk to identify potential candidates for promotion. Figure 12 exhibits the efficiency score vs job compensation of current crew members.

The analysis revealed that Stilwell, a driving crew member, completed 399 jobs and had a statistically significant high-efficiency score. Similarly, among the non-driving crew members, Coen completed 196 jobs with a statistically significant high-efficiency score.

Implementing a two-pronged strategy for determining employee compensation and promotion may be prudent. This could be based on each employee's efficiency score and customer review scores. By incorporating both of these metrics, the company can promote the most efficient and effective crew members while also considering customer satisfaction.

A data-driven approach to employee compensation and promotion decisions can help ensure that the company is making the most of its resources and retaining its most valuable employees.

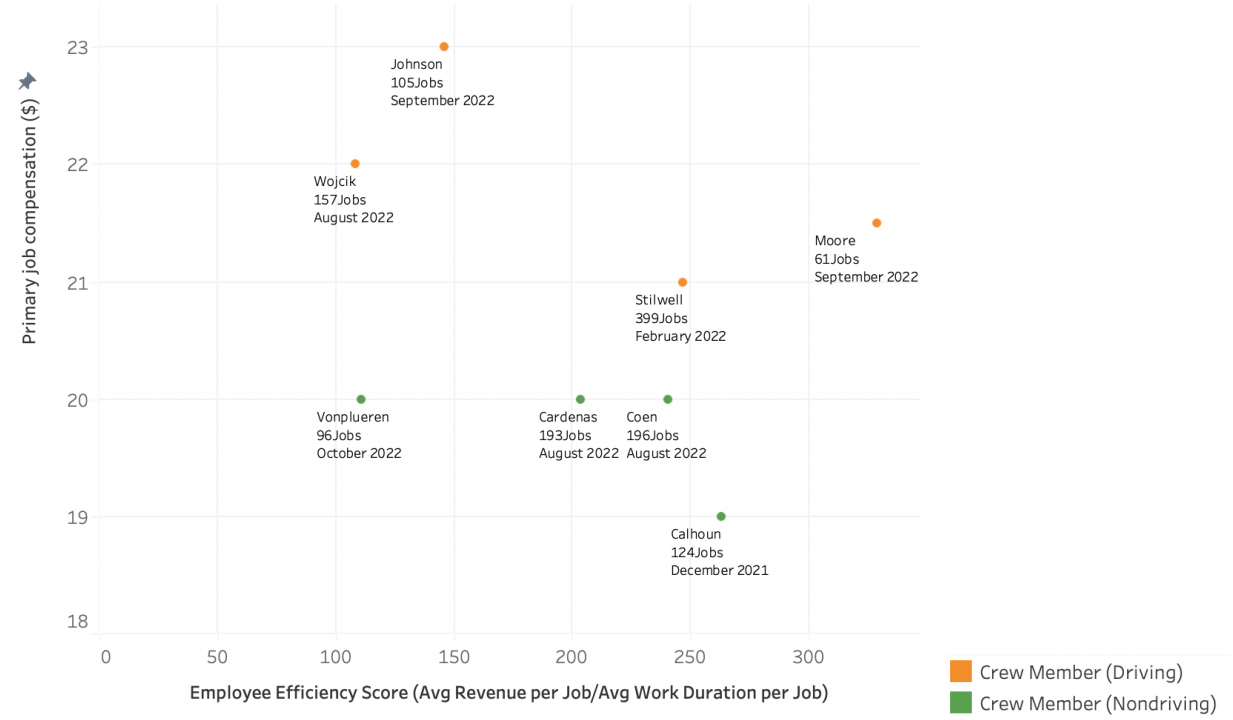

Figure 12: Efficiency Score vs Job Compensation of Current Crew Members

4. Understanding the Movement of GI Junk's Fleet

Currently, GI Junk trucks move from one client location to another largely based on the appointment/ schedule time at these houses (as shown in Route Optimisation Tableau Package). However, it is observed that in the process, GI Junk employees working on a specific set of client locations often do not take the most optimal route. As a result, the fuel cost incurred and the time to get to these houses are higher than expected.

For instance, in Figure 13, the GI Junk team travels from point A to B and back again from point B towards A to cover the next set of houses. This route increases the time houses A and B are covered and the cost incurred during the travel. The total distance traveled by GI Junk here is 140 miles. Thus, GI Junk would benefit from a more optimized transportation route system that can reduce costs and possibly enable the firm to accommodate more houses on a given day.

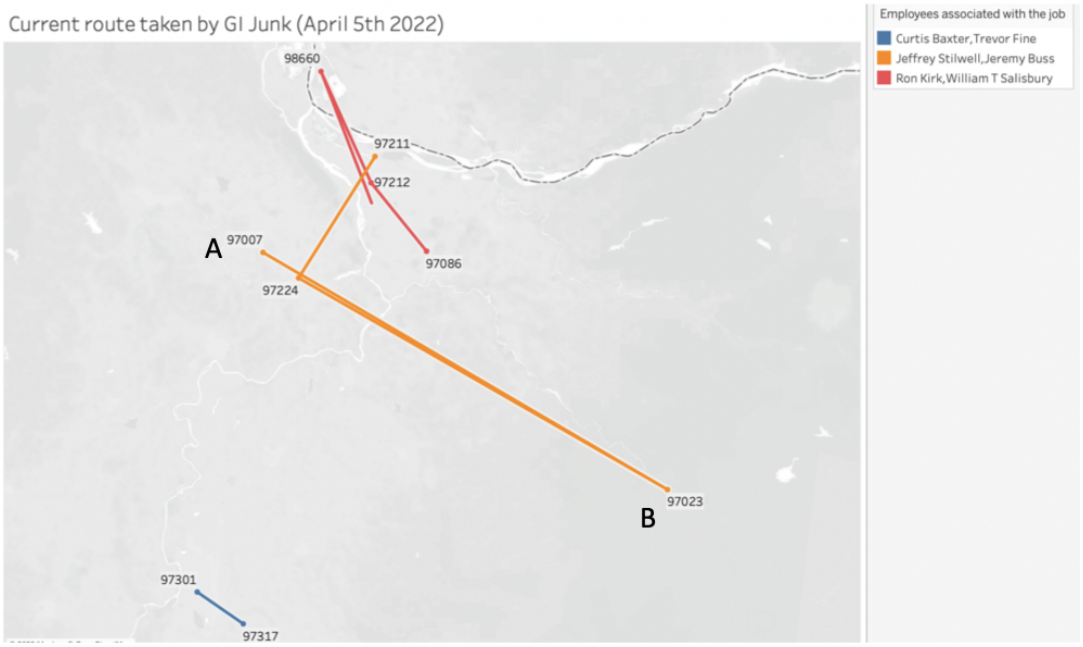

Figure 13 : Representation of the Current Route Traversed by GI Junk

Figure 14 below represents an alternate optimized route that covers the same client locations but leverages a different route to achieve this goal. By taking the route ACDB spanning 84 miles, GI Junk could save 56 miles. Moreover, GI Junk could potentially save time and fuel by unloading at Central station instead of South station, which is closer to the route between points C and D. By reducing travel time, GI Junk can complete more jobs and potentially increase revenue

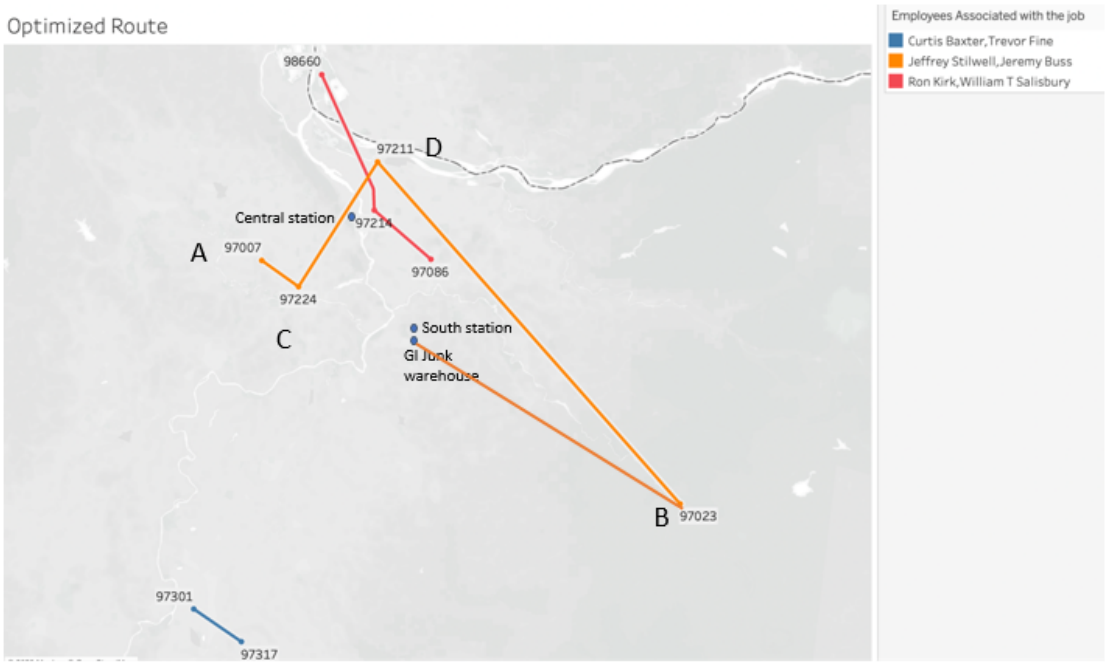

Figure 14 : Representation of the Optimized Route that can be Leveraged by GI Junk

The table below shows the benefits obtained by leveraging the optimized route:

<table>
<tr><td>Distance covered with the current route</td><td>140 miles</td><td rowspan="2">Difference in distance covered = 56 miles</td></tr>
<tr><td>Distance covered with the optimized route</td><td>84 miles</td></tr>
<tr><td>Time taken to cover the current route (assuming an average vehicle speed of 45 miles per hour)</td><td>3 hours</td><td rowspan="2">Difference in time taken = 1 hour</td></tr>
<tr><td>Time taken to cover the optimized route</td><td>2 hours</td></tr>
<tr><td>Average time taken to complete a 1/4 load job (hours)</td><td colspan="2">1</td></tr>
<tr><td>Average revenue per 1/4 load job</td><td colspan="2">400 USD</td></tr>
<tr><td>Estimated revenue gain (assuming no additional travel time involved here)</td><td colspan="2">400 USD</td></tr>
</table>

It is thus observed that leveraging the optimized route could potentially increase the revenue for GI Junk by an additional 400 USD

Based on the above analysis, it will be pertinent to rethink the route GI Junk undertakes during its travel to ensure profitability.

Conclusion

Based on the data analysis conducted by the team, the following recommendations may aid GI Junk in improving its business operations:

1. Enhance customer acquisition strategy, specifically targeting the elderly for increased revenue per job. It is understood that the elderly population is a growing demographic with unique needs and preferences. GI Junk may benefit by focusing on an approach to attracting and retaining elderly customers while also finding ways to increase the revenue earned from each transaction.
2. Implement an automated confirmation system that can improve the customer support team's efficiency and leave more time for outbound marketing campaigns by the

team. By freeing up time for the customer support team to work on these campaigns, the business can potentially increase its revenue and customer base.

3. To tackle challenges around turnover rate and improve employee efficiency, GI Junk may benefit from implementing a two-pronged strategy. This will take into account the efficiency score of employees along with the customer reviews. The system should incentivize employees who score well on both fronts through bonuses, promotions, recognitions, etc., motivating them to perform better and improve their overall performance.
4. Ensure route optimization based on distance instead of scheduled times to increase savings. When clients have flexibility in their scheduled date or time, the company should prioritize addressing their requirements based on the proximity of the client location. Additionally, dumping junk at the nearest facility and partnering with more dumping stations can help reduce costs and time, enabling the firm to complete more jobs in a given day.
5. GI Junk can look into partnering with local charities and donation centers to offer a donation service for furniture items such as couches and loveseats. This would allow customers to donate unwanted furniture items through GI Junk, with the company facilitating the donation process.
6. GI Junk can look into offering recycling services for electronic equipment, including treadmills. This will appeal to environmentally conscious customers who may be hesitant to dispose of these items. GI Junk can expand its customer base and differentiate itself from competitors by providing this service.

As the next steps, it may also be useful for the GI Junk team to capture data pertaining to call recordings that can be leveraged further for sentiment analysis.