

Strategic Workforce Development: Analysis for Addressing Labour Shortage

Final Report for the BDM Capstone Project

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1. Executive Summary

Quality Instruments and Equipments is a B2B manufacturing firm, producing laboratory and pharmaceutical equipment such as ovens, dryers, heaters, cashew processing equipment, etc. The company has its primary manufacturing unit in Kudal, Maharashtra with another branch in Goregaon, Mumbai. Led by Mr. Gaurav Mestry, the company has a team of 13 employees who cater to the demands of this very specific branch of the manufacturing industry.

Although seeing an upward trend in sales throughout the decades, shortage of workforce with the required skills has hindered the company's ability to thrive and expand in the industry.

This report builds upon previous analyses to provide the business with a comprehensive understanding of the challenges it faces, the underlying factors contributing to these issues, and actionable strategies for effective mitigation. The data pertaining to the company's sales, purchases and payroll was collected for the fiscal years 2021-2022 and 2022-2023. Thorough cleaning of the data was done through the means of spreadsheets and Pandas. Using pie charts, stacked bar charts and line charts, effective visualizations were created to understand the trends in key business indicators such as profit, key products, usual working days and overtime hours, etc. This extensive data analysis revealed the under-utilization of the working days throughout different periods of the year. In order to optimize these, techniques such as Linear Programming and cost benefit analysis were used which resulted in various strategies to tackle the problems faced by the firm.

In order to make the best use of the time and potential of the workforce, the under-utilized manpower can be directed to participate in skill enhancement programs to facilitate continuous growth and development. Also, providing better working conditions such as fixed working hours, incentives and bonuses can help develop a workforce which is motivated and engaged in the company's overall success.

2. Detailed Explanation about Analysis

The project was prepared in collaboration with Quality Equipments and Instruments, a B2B manufacturing firm based in Kudal, Maharashtra. The following explains the analysis process:

2.1 Meeting with the Company

A meeting with the accounts' manager, Mr. Jayesh Mestry was held on 18th of June, 2024, in the Goregaon office of the firm. Mr. Mestry gave a comprehensive idea regarding the operations and key SKUs of the firm. The company is engaged in the

production of pharmaceutical and laboratory instruments such as ovens, heaters, dryers, incubators, etc. After giving an idea of the production process which is carried out in two stages, building a prototype and manufacturing, Mr. Mestry conveyed that the firm operates on knowledge intensive production process and there has been a shortage of such skilled labour in the industry post-pandemic. He informed that they have 13 employees and a few others are hired on an on-demand basis. However, these extra workers have to be hired at a higher cost. He also mentioned about the firm wanting to explore other segments of the market where cooling and heating instruments are required such as the automobile industry. However, the employees do not possess the required skills to be able to produce products which cater to the demand of the automobile segment. Mr. Mestry while specifying how the company could address the issue, said that, they could provide skill training to their employees which could help them acquire the needed skills or they could hire employees with the required skills from the market. Both these approaches require incurring extra costs. Hence, the primary challenge of the company was narrowed down to labour shortage. Finding best methods to address the same is the objective of this project.

2.2 Data Collection

The company manages their data in Tally software. The accounts for each fiscal year such as Profit & Loss account, Trading Account, Balance sheets are created towards the end of the year. The data for the years 2021-2022 and 2022-2023 was provided through e-mail in the form of Tally Zip files. This contained data pertaining to sales such as product, rate, total, month and data pertaining to purchases such as date, company and amount. The payroll of the company is managed manually on excel sheets. Every month has a different sheet which contains employee names, their wage rates, any advances/loans taken by them, total payable salary to each employee, etc. These excel sheets for the same fiscal years were provided via e-mail.

2.3 Data Extraction and Cleaning

The analysis conducted in this report is based on the productivity of the human resources employed. Productivity and efficiency are measured in terms of outputs and inputs to the production process. Hence, the data pertaining to output, i.e. sales and inputs which are purchases and wages paid were extracted in the form of Excel Sheets. The sales data contained entries about scrap material being sold, which were excluded.

The payroll data contained entries where some rows had null values, which were also excluded. These were saved in the form of CSVs which were then loaded into Google Colab for further analysis.

2.4 Exploratory Data Analysis and Descriptive Statistics

Effective visualizations help communicate patterns which are not immediately apparent enabling clearer insights. Hence, exploratory data analysis was performed to understand the key relationships between different data variables, using tools such as Seaborn, Matplotlib, Plotly, Pandas and NumPy. Line charts, pie charts and bar plots were created for variables like revenue, purchases, average wage rates in order to identify the patterns and spot bottlenecks if any. Statistics such as mean, medians, maximum values, minimum values, standard deviation, quantiles were computed to understand the spread of the data. Important insights such periods of high sales and of labour shortage were identified through this data visualization.

2.5 Strategies to address the problem

The exploratory data analysis provided a basis to perform further analysis which would help the firm deploy potential solutions and strategies to mitigate the issue.

The primary issue of labour shortage and high cost of hiring skilled labour (as mentioned in Problem Statement 1, 2 and 3) have been addressed using the following approaches: -

1. Productivity Analysis

Evaluation of the productivity of the labour input is crucial in order to assess the severity of the labour shortage and its impact on the revenue and profit. Output per paid day per labour was considered as a productivity metric, utilized to calculate productivity for each month of the year. The below formula was used for the same:

$$Productivity = \frac{Output\ per\ paid\ day}{Total\ employees\ in\ a\ month}$$

The interpretation of the productivity metric is the output produced by each worker on each paid day of a month.

2. Linear Programming Problem (LPP)

The objective of conducting optimization analysis is examining whether lesser labour can generate the same amount of revenue. As previously mentioned, the

production process is a combination of inputs and outputs. Efficient use of these resources plays a crucial role in determining the cost of production of goods and also impacts the profitability of the firm. Linear Programming problems help find a way for optimal utilization of resources such as maximizing profits and minimizing costs in order to yield the best possible outcome.

Hence, a linear programming problem was formulated to determine whether the demand for the products in a month can still be met when the total number of working days for each labour is reduced. Python library “Pulp” was used to formulate and solve these LPPs. Since, the number of workers remains almost the same throughout the month but the number of days they show up for work (paid days) varies, the average paid days for a month is considered in the optimization problem and not the number of workers. The decision variables in the optimization problem are the quantities of the products that have to be produced.

But the firm produces over 100 SKUs. So, they were grouped into 9 categories which are:

- Cashew Processing Equipment
- Blower
- Dryer
- Heater
- Oven
- Tray
- Incubator
- Bath
- Cooling Instruments

These are the general categories into which the products can be grouped. These form the decision variables of the optimization function. The formulation of the LPP is as follows:

Formulation:

Decision Variables: Number of products that can be produced for each category.

Objective Function:

Minimize the sum of total paid days required to produce the demanded number of products in a month

$$\text{Total Paid Days} = \text{Number of Days required to produce each product} * \text{Number of each product produced}$$

Subject to Constraints:

Constraint 1: The current level of profitability should be maintained

$$\text{Sales} - \text{Purchases} - (\text{Total Paid Days} * \text{Wage Rate}) \geq \text{Current Profit}$$

Constraint 2: The total paid days achieved by optimization should be less than the available paid days in a month. Here, total available paid days refer to the product of average paid days and number of employees as previously mentioned.

$$\text{Total Paid Days} \leq \text{Total available paid days}$$

Constraint 3 to 12: These constraints make sure that the amount of each product produced is at least as much as the amount demanded.

$$\text{Quantity produced} \geq \text{Quantity Demanded}$$

3. Cost Benefit Analysis

The above linear programming problem will be formulated for each month. The solutions obtained from these problems will help determine whether the working days in a month can be reduced while achieving the same production capacity. If there is a need for more working days, i.e. more workers in some months, a cost benefit analysis to address how will those additional workers be arranged is conducted. This analysis will dissect the cost and the benefits of hiring additional skilled workers or training employees to address additional manpower requirement.

2.6 Outcomes of the Project and Recommendations for the firm

The project aims to assist the business to get a statistical understanding and severity of the challenges faced by them. The analysis conducted throughout the duration of the project will provide the firm with potential solutions and also the cost of implementing these solutions. A business problem cannot be addressed through the means of one statistical analysis. Continuous assessment and improvement are essential to alleviate the problem. Labour shortage is an industry wide problem which cannot be addressed with short term solutions. In such a case, long term solutions like technological advancement become essential.

3. Results and Findings

This section summarizes the results of the analysis process mentioned above to understand the likely solutions.

3.1 The revenue trend and its relation to labour input

By analysis of the revenue trend and the average paid days throughout the year, it was deciphered that the paid days are less in periods of high sale. Intuitively, the sales trend and the working days in a month, should show a positive correlation, but this is not always the case for Quality Instruments and Equipments.

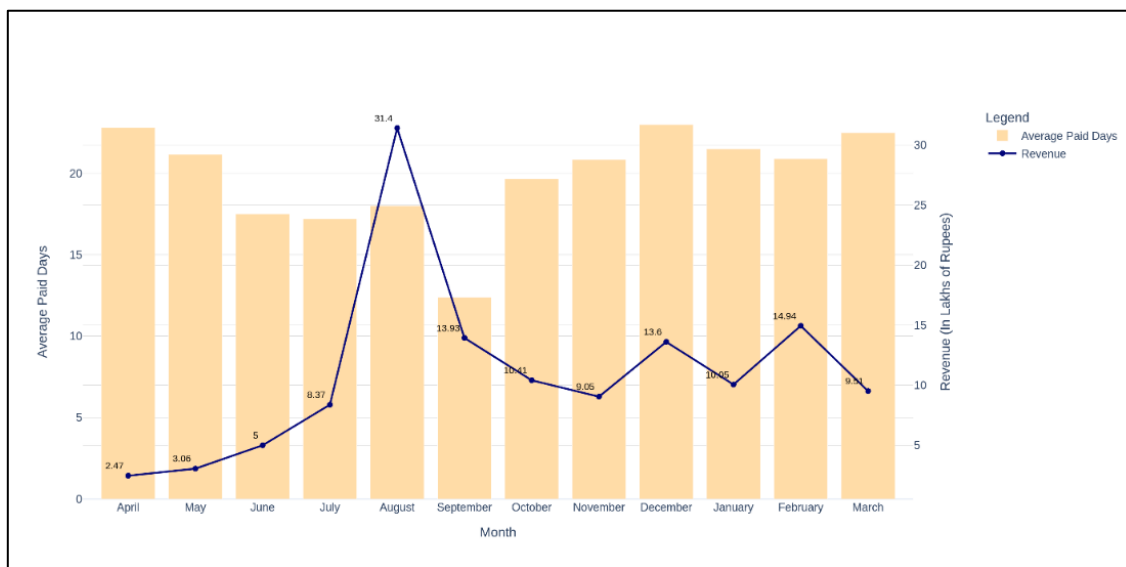


Figure 1.1 Revenue and Average Paid Days for the Fiscal Year 2021-2022

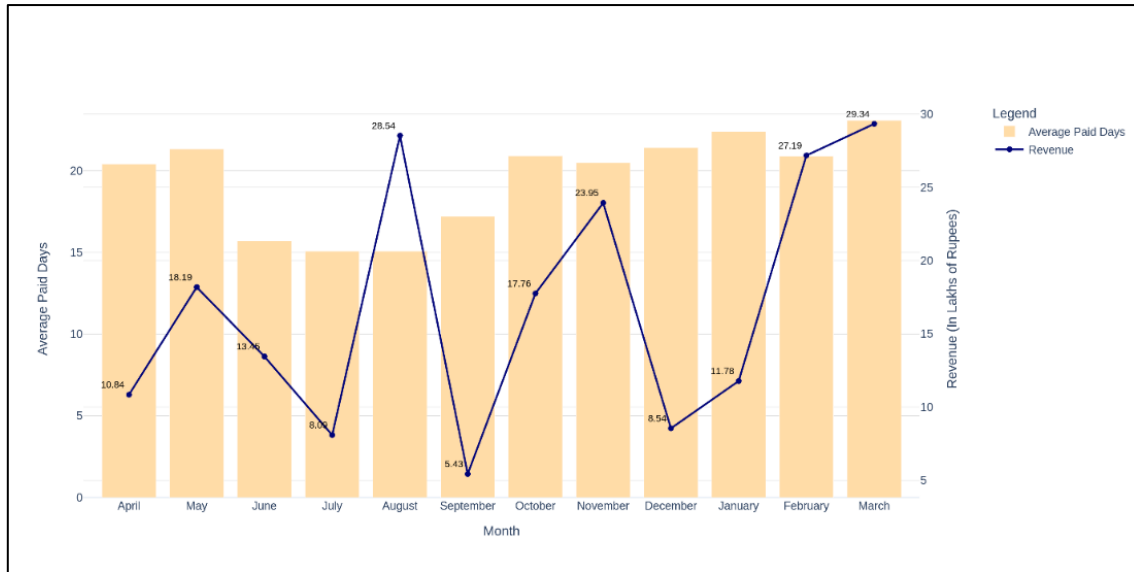


Figure 1.2 Revenue and Average Paid Days for the Fiscal Year 2022-2023

Figure 1.1 and 1.2 represent the average paid days in a month and the sales revenue trend for the years 2021-2022 and 2022-2023. For the month of August in both the years, the paid days are lower, but the revenue is high as compared to the other months. June, July and September also have less paid days and a low revenue. In the other months for the year 2021-2022, although the working days are high, the revenue remains drastically low as compared to the month of August. For the year 2022-2023, the total revenue is higher as compared to the year 2021-2022. In the year 22-23, some months do show a positive effect of high working days such as November, February and March, but the other months, have a low revenue, despite higher working days.

3.2 Contribution of Product Categories to revenue

The product categories, as classified for the LPP, were plotted as a pie chart to discern the products which have the highest contribution to revenue. The company manufactures small equipment such as sensors, thermocouples, hinges, wires, etc, which are used in the production of other products and sometimes sold separately. Since, they contribute a small part to the revenue, they are included as a product category in creating the pie chart.

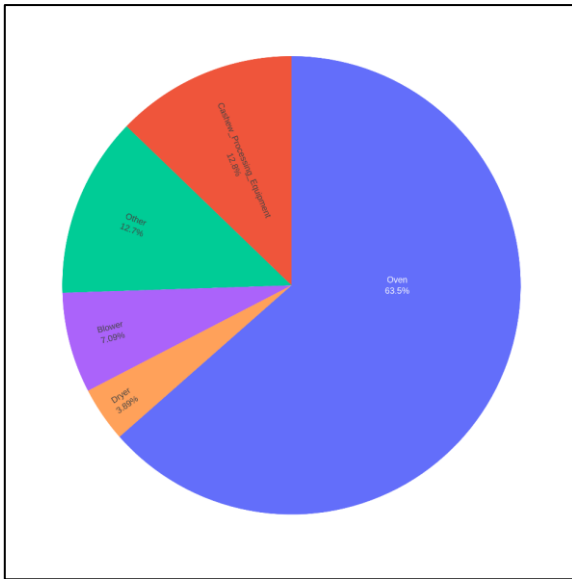


Figure 2.1 Contribution of Products to Revenue
Fiscal Year 2021-2022

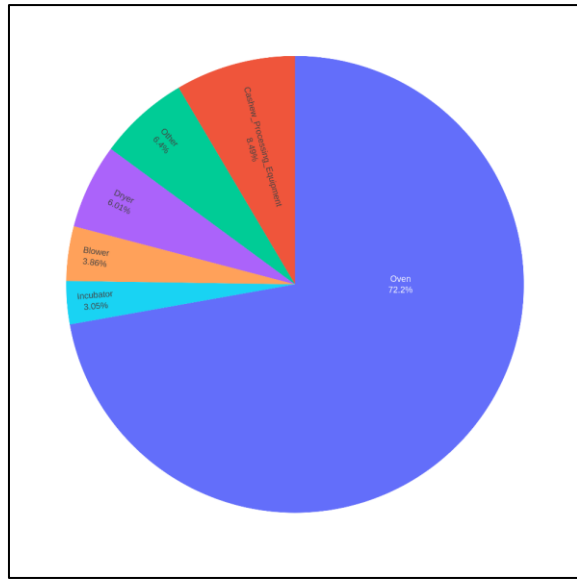


Figure 2.2 Contribution of Products to Revenue
Fiscal Year 2022-2023

Figure 2.1 and 2.2 represent the contribution of each product category to the revenue.

The category “Other” includes all those categories which have a contribution of less than 3% individually. For the year 2021-2022, products such as heaters, bath, incubators, dryers and cooling instruments had a contribution of less than 3%, hence, they are included in the “Other” category. For the year 2022-2023, the products such as heaters, bath, dryers and cooling instruments were included in the “Other” category.

The category of ovens contributes highest to the revenue, followed by cashew processing equipment, for both the years. The share of “Other” is 12.7% for the year 2021-2022, which indicates that the contribution of a number product categories was not considerable individually but the combined revenue was significant.

3.3 Profit Trend

Profit is the simplest, yet informative indicator of overall performance of the business. It provides a deeper insight of the performance of the business and gives a signal as to when the costs become higher than the revenue. Analysis of the profit trend would indicate periods when optimization becomes necessary in order to at least break even.

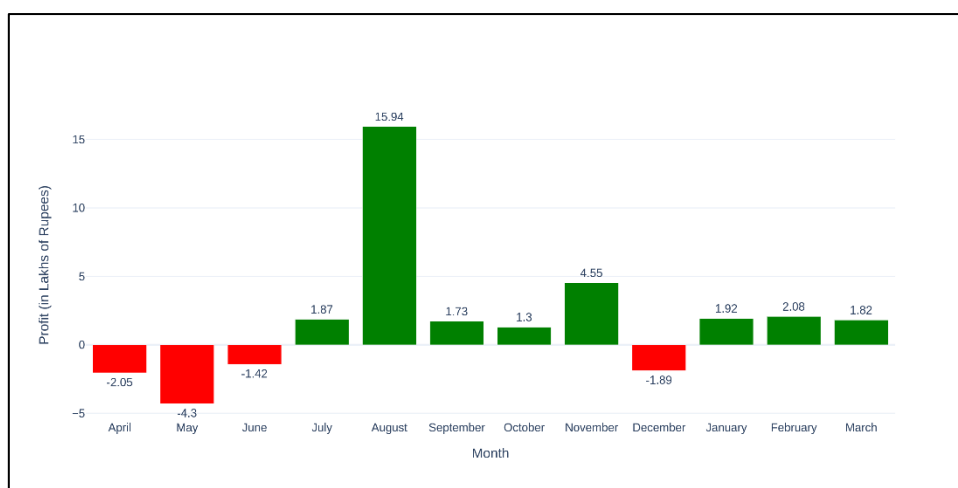


Figure 3.1 Profit for the fiscal year 2021-2022

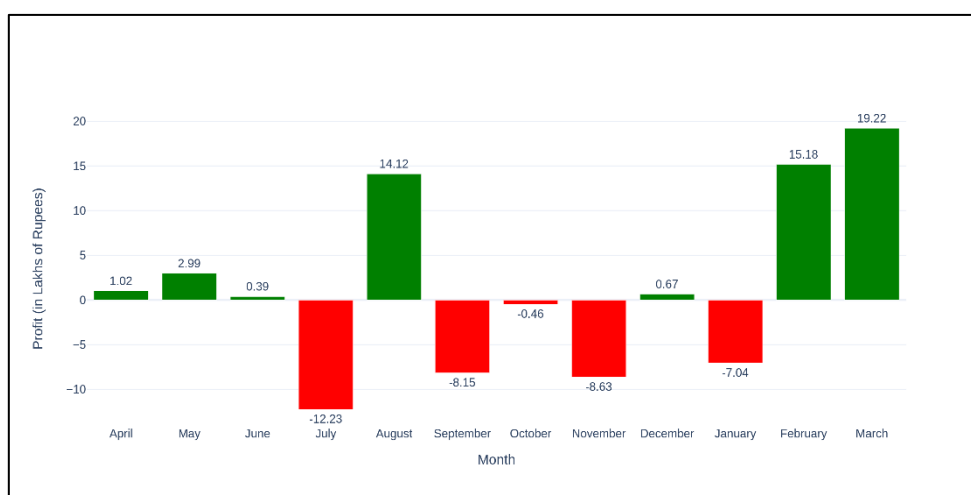


Figure 3.2 Profit for the fiscal year 2022-2023

Figure 3.1 and 3.2 show the profit made for each month for the year 2021-2022 and 2022-2023 respectively. It can be seen that profit remains negative for 4 months in 2021-2022 and 5 months for 2022-2023. The losses for the year 2022-2023 are higher than the losses in the previous year. An all-time high loss of ₹12,23,000 is observed in the month of July 2022. The months of April, May for both the years, have higher average paid days (See Figure 1.1 and 1.2) but significantly lower (even negative) profits. This indicates that the cost incurred in these months are higher than required. The sales in these months remain low and so is the requirement of labour. Reducing the average paid days in these months, can reduce the costs. The profits have been high for months like August 2021, August 2022, February, 2023 and March 2023, the maximum being for March 2023. For the other months which have non negative profit, the profit remains low, approximately around 10-15% of the revenue.

3.4 Overtime Trend

Employees work overtime for varying number of hours in a month. Working overtime increases the expenses on salary and also additional costs (for example- electricity bills) have to be incurred to keep the factory running beyond working hours. Hence, it is necessary to ensure employees work overtime only if absolutely necessary and the overtime hours are being used efficiently.

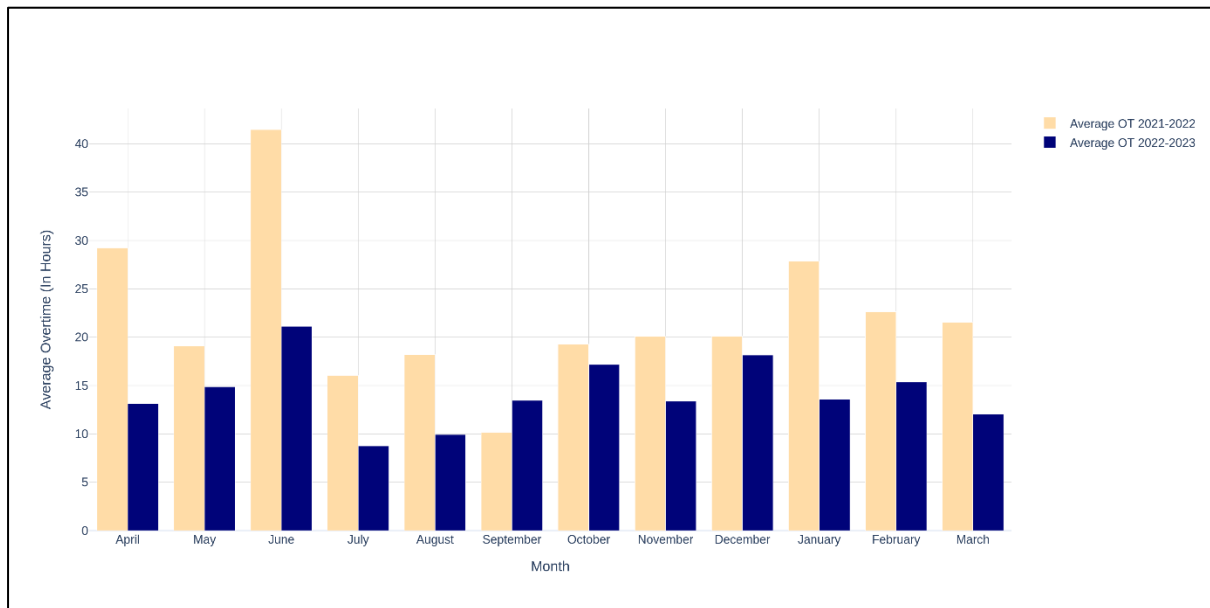


Figure 3 Average Overtime in Hours for the fiscal years 2021-2022 & 2022-2023

Figure 4 shows how many overtime hours does an employee work for on an average in each month. The yellow bars represent the overtime hours for the year 2021-2022 and the blue bars, represent the same for the year 2022-2023. It can be observed that the overtime hours for the year 2021-2022 remain higher than that of the year 2022-2023.

The month of June 2021 (yellow bar) has the highest overtime, greater than 40 hours. This indicates that on an average, each employee worked 5 days (40/8) extra for the month of June. Intuitively, the overtime for a month should be high if the working days are not enough to be able meet the demand. But this is not the case for June 2021. The revenue for the month of June remains comparatively low, which indicates less demand in that month. Higher overtime indicates the working shifts were not utilized to their maximum potential. Similar is the case for months like January 2022 (yellow bar), June 2022 (blue bar), December 2022 (blue bar).

This analysis becomes important for the business as it can bring to light the shortcomings in the use of resources which can be re-allocated through optimization.

3.5 Less paid days can achieve same output

The LPP analysis as mentioned in the [Linear Programming Problem \(LPP\)](#) section of this report, was carried out for each month of both the fiscal years. The aim of this analysis was to find out whether the production demand for that month can still be achieved if the total available working days are reduced.

The objective function of these problems uses the number of days required to produce one unit of each product category. This was calculated by finding out the proportion of rate of each product in the sum of rates of products. This proportion indicates how large the product is in comparison to the other products produced that month.

For example, suppose the LPP is being formulated for the month of April 2021. Assume that the average rate of an oven sold in that month is ₹10000 and the average rate of a tray being sold in the same month is ₹1000. Hence, it can be concluded that the production of a single oven will require more days than the production of a single tray. Using this logical assumption, the number of days required for producing each product is calculated.

The Linear Programming Problems (LPPs) were formulated to check whether the quantity produced of each product and the number of days it took to produce a product, were feasible. If that is not feasible within the available production days, then there is no point of trying to reduce the same, in that month.

The results of these initial LPPs formulated are presented below.

Month	Status	Actual Paid Days ¹	Optimized Paid Days
April	Optimal	324	96
May	Optimal	300	104
June	Optimal	288	110
July	Optimal	252	118
August	Infeasible	252	162.1863
September	Infeasible	180	183.2206
October	Optimal	276	156
November	Optimal	288	58
December	Optimal	312	182

¹ The Actual Paid days are above the usual 31 for each month, since they indicate the total paid days, if each employee works for 25 days in a month and there are 12 employees, effectively there would be $25 \times 12 = 300$ paid days.

January	Infeasible	312	300.6808
February	Optimal	288	156
March	Optimal	312	206

Table 1. Results of LPP for the year 2021-2022

Month	Status	Actual Paid Days	Optimized Paid Days
April	Optimal	276	121
May	Optimal	288	88
June	Infeasible	228	195.075
July	Infeasible	216	206
August	Infeasible	216	164.6182
September	Optimal	240	108
October	Infeasible	288	213.7886
November	Optimal	276	169
December	Optimal	300	160
January	Optimal	300	74
February	Infeasible	276	220.6264
March	Infeasible	312	359.5616

Table 2. Results of LPP for the year 2022-2023

Table 1 shows the results of the linear programming problems formulated for the fiscal year 2021-2022. The Status column represents whether producing the demanded number of products was feasible in the total available paid days. (Total available paid days is the product of average paid days in a month and number of employees). Wherever the status is “Infeasible”, it conveys that, given the quantity to be produced in that month and given the amount of days each employee will work for, it was not possible to produce within the available paid days while maintaining a profit. Hence, if the paid days in the “Infeasible” months are reduced to the “optimized paid days”, the production demand will not be satisfied. For the months which have the status as “Optimal”, the quantity demanded can be produced within the “optimized paid days”. For example, for the month of April 2021 which is optimal, the actual paid days is 324, which means, each employee worked for 27 days ($324 \div \text{Number of Employees}$). But the production demand can be met within optimized production days i.e. 96 days. If each employee worked only for 8 days ($96 \div \text{Number of Employees}$), same quantity of products would be produced. Hence, the cost on those extra days ($324-96$) can be saved.

Table 2 shows the results of the linear programming problem formulated for the fiscal year 2022-2023. In this table a lot of months have the status “Infeasible”, which means, the labour input cannot be adjusted in most of the months.

These tables help to understand that there are periods in the year where the number of workers and working days are significantly higher than what is needed. Of course, this is based on the assumption that the products made are perfectly produced the first time and that there are no machine breakdowns or maintenance periods. Despite this assumption, there is a significant decrease in paid days for months like April 2021 (Refer Table 1), November 2021 (Refer Table 1), May 2022 (Refer Table 2), January 2023 (Refer Table 2). This huge difference indicates that there is a need for optimization of working days.

For months which have the status “Infeasible”, they could be made optimal by increasing the number of paid days in order to achieve the required production capacity. Hence, the costs incurred on the months with excess labour, can be diverted to the months with higher production requirement in order to facilitate the best possible use of resources.

The following charts show the distribution of products with their quantities and also the optimized paid days in which they can be produced.

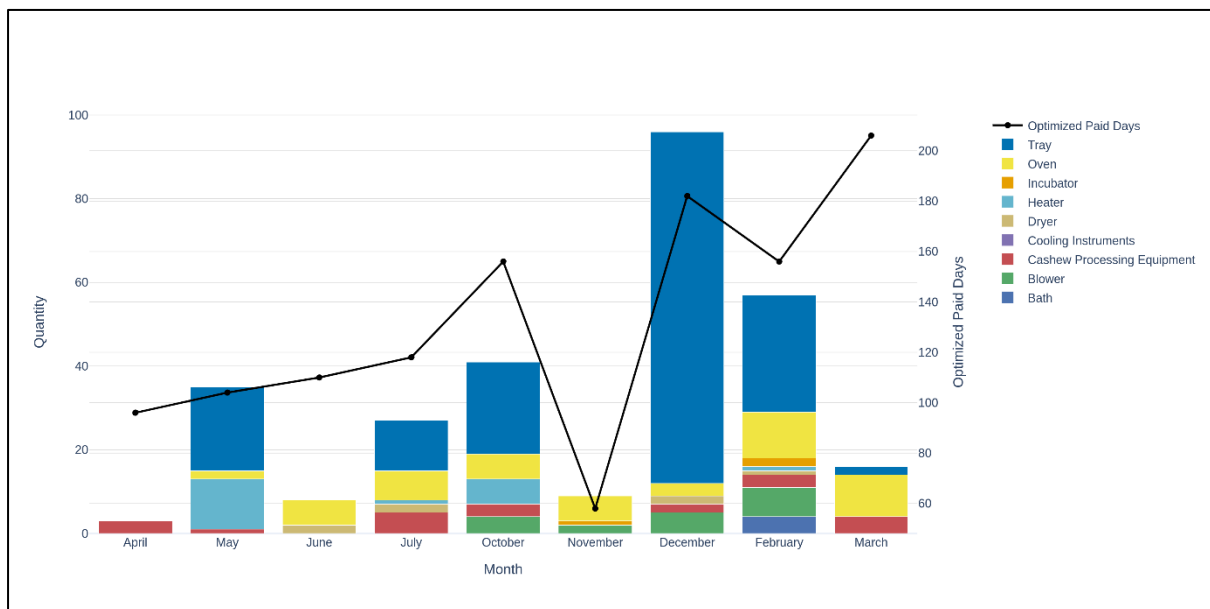


Figure 4.1 Product Quantities and Optimized Paid Days for the Fiscal year 2021-2023

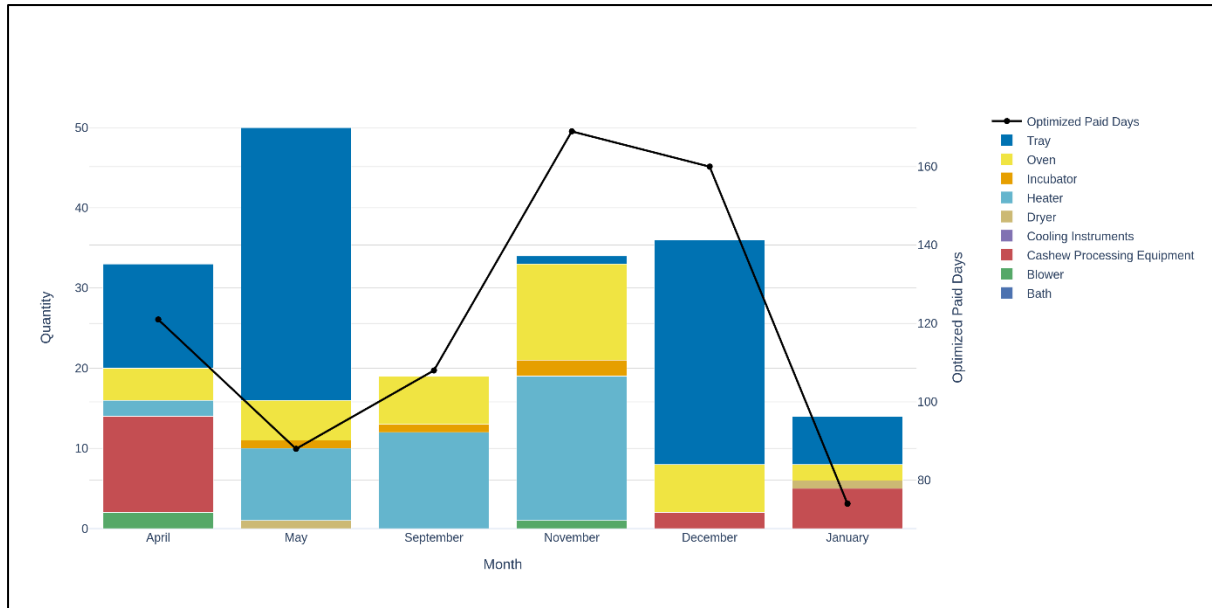


Figure 5.2 Product Quantities and Optimized Paid Days for the Fiscal year 2022-2023

Figure 5.1 and 5.2 show the Optimized Paid Days and the actual quantities that can be produced from the Tables 1 and 2, only for the months which have the status “Optimal”. It can be seen that the paid days are adjusted according to the product category and the product quantity. For example, the paid days are lower in the month of May 2022 (See Figure 5.2), even though the total quantity is higher, because there is a greater number of trays to be produced which require less days per unit. But, in the month of November 2022 (See Figure 5.2), even though quantity to be produced is lower, there is a greater share of ovens to be produced, hence the paid days are higher for that month. The LPP model also distributes the paid days according to the average price of the same product. For example, comparing the month of May 2022 and December 2022 (See Figure 5.2), the share of trays is approximately the same, but the average price of trays for May is ₹315 and for the latter it is ₹1190. This indicates the trays are larger in dimensions in the month of December than in May, requiring a greater number of days. Hence, the same is taken into account.

3.6 Balancing Employee Hiring and Training

The company remains conflicted between the ideas of employee hiring and employee training. There are pros and cons associated with both the ideas. To mention some of them-

- Employee training can help bridge the technological gap between the skills possessed by the employees and skills required in the industry. This will boost the morale of the workers, thus making them more efficient and productive. Training which provides skills to produce

equipment for the automobile industry can also be provided to fulfil the aspiration of exploring the same.

- However, according to the norm of the industry, daily wage workers work wherever they are hired at a higher wage rate. As employee training makes them better suited for jobs with larger technical requirements, they can be offered a higher wage in some other company. If this occurs, the company will not only lose all the expenses incurred for training, but also, the employer might have to incur additional costs to retain the labour.
- On the other hand, hiring a skilled employee from the market does not involve training costs, but it does involve providing a significantly higher wage rate so as to incentivize the workers to work with the company.
- Along with a significantly higher wage, the employer has to spend additional time and money for the recruitment process which is a tedious task.

Hence, instead of choosing one particular strategy, a balanced approach with both proves to be beneficial. As mentioned in the previous section of the analysis, there are periods in the year when the labour input can be reduced. These excess workers can be enrolled into training programs, which will help them acquire more skills, without having to hamper the production process. A continuous assessment of the employees along with skill enhancement initiatives makes them adapt to the fast-changing technology resulting in increased expertise. This will also facilitate judicious use of resources in order to minimize mishaps and produce quality goods without creating a lot of scrap material.

Along with this skill training, if hiring employees with some particular skills becomes essential for producing some particular product, they can be hired by incurring a one-time cost. In this manner, a balanced approach which focuses on continuous enhancement of the workforce can lead to addressing the labour shortage issue in the long run.

The above strategies can be explained with the means of an example-

Consider the month of April 2022. [Table 2](#). Results of LPP for the year 2022-2023 shows that the quantity demanded can be produced in 121 paid days instead of 276. This indicates that instead of each employee working for approximately 23 days in a month, the work can be completed by working 11 days in a month. These saved days can now be utilized for skill enhancement which will lead to increased costs in the short run but will benefit the firm in the long run.

4. Interpretation of Results and Recommendations

Summarizing the problem statements mentioned in the proposal, industry wide shortfall of labour led to reduced profitability for the firm. The manufacturing of highly specialized and detailed equipment such as ovens, incubators, etc, requires specific technical skills. Such highly skilled workers have to be hired at a very high rate, impacting the profitability of the firm. Lastly, ambivalence about choosing the right strategy for addressing labour shortage is delaying the implementation of a long-term solution regarding the issues faced.

Addressing each issue through analysis, the following insights have been gained.

4.1 Interpretation of Results

1. The productivity analysis conducted in the midterm report measures the output per labour per paid day. This analysis revealed that even during periods of low labour strength, production demand can be met. In monsoon, the company faces a shortfall of labour as they leave for their native places to tend to agricultural activities. However, the company sees a surge in sales during this period. Hence, the orders are completed even with less manpower. This indicates that during the other periods of the year, the human resources are underutilized.
2. Revenue does not always have a positive correlation with labour input throughout the year. As shown in Figures 1.1 and 1.2, certain periods of the year experience high numbers of working days but low revenue. This imbalance indicates that excessive labour during times of low sales significantly reduces profitability.
3. Profitability remains low and also becomes negative in 4-5 months in a year. During the slack period (months of April, May, June with low sales), an extremely low profit for the year 2022-2023 and losses for the year 2021-2022 have been observed. Refer figures 3.1 and 3.2. There are substantial losses also during the months of July, September, November and January in the year 2022-2023. This indicates various problems with the management of costs. Purchases and labour costs management during these periods should be done effectively in order to reduce the losses.
4. The overtime hours do not seem to have a positive effect on the sales and profit, since, for the months where the overtime hours are comparatively higher, the sales and profit

are not considerably high. For example, the profit during the month of June 2021 was negative (See Figure 3.1) but the overtime hours during that month was the highest (See Figure 4). These excessive overtime hours indicate the inadequate utilization of the usual working hours.

5. The LPP optimization results support the argument made by the above points that the human resources of the company are not being utilized judiciously. There are a number of months when the production demand is low and can be met in lesser working days. This has not been taken into consideration by the company. There is excess labour employed in the production process during various months. Steps need to be taken to divert this excess human resource in order to utilize them to their maximum potential.

4.2 Recommendations

1. Focus on long term solutions to address labour shortage

The issue of labour shortage cannot be addressed with short term hikes in wages. These temporary hikes not only increase costs but do not address the root cause. A long-term solution of skill enhancement will be necessary in order to bridge the technology-skills gap. Skill enhancement will boost the morale of workers and also give the workers a sense of career growth and job satisfaction leading to greater engagement in the company's visions and goals.

2. Distribute Resources and Activities throughout the year

As seen in the section of LPP optimization, the human resources can be utilized in a better manner to achieve a greater output. Diversifying some of the workforce towards skill enhancement activities will help in addressing the labour shortage issue in the long run. The company produces products as per demand but there are some components which are used in the manufacturing of all the products, for example, trays and cabinets for ovens and incubators, cashew processing tables. When the production demand is low, these small components can be produced in surplus and stored, so as to fasten the production process during periods of labour shortage. The general equipment such as sensors, thermocouples are produced inhouse, taking up the time and resources of the company. This equipment can be outsourced which help focus on the important production activities of the firm.

3. Working Overtime only when needed

An increased productivity of labour during the usual working hours will reduce the need for working overtime. Overtime hours cause employee burnout and fatigue, hence being counterproductive towards the goal of high production. Making employees work overtime only when needed reduces the costs incurred to keep the factory running after usual hours and also helps maintain employee wellbeing.

4. Incentivize the workforce during periods of low labour availability

As there seems to be a labour shortage in the months of monsoon, incentivizing workers to stay at their jobs becomes essential. Offering a higher wage or bonus during these months can persuade them to show up during these periods. A small percentage of the sales during these periods can be offered as commission to the workers to reward attendance.

5. Providing maintenance and repair services on a regular-basis

The company provides maintenance and repair services but not regularly. Such large industrial equipment requires regular maintenance. Hence, the firm can provide repair and maintenance services to their regular customers by introducing monthly or yearly visits to address the regular wear and tear. Providing such services on a regular basis can lead to retaining loyal customers, increased customer satisfaction, and also provide some contribution to the revenue.

6. Closely monitoring processes and technological advancement

In order to spot inconsistencies and challenges, closely monitoring all the processes of the firm is extremely important. Regular data surveillance can provide insights which can help in resource optimization and decision-making process.

Along with optimization of the workforce, being in pace with the fast-changing technology is crucial to thrive in the manufacturing industry. Hence, introducing new technology is important for Quality Instruments & Equipments for staying updated and at par with the ever-changing manufacturing industry.