INVENTORY DEMAND FORECASTING FOR A MOTORCYCLE COMPANY

A FINAL SUBMISSION

presented in partial fulfillment of the course

BUSINESS DATA MANAGEMENT (BSCMS2001)

by

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EXECUTIVE SUMMARY:

This capstone project is focused on optimizing and forecasting the inventory demand for spare parts of a motorcycle company named MR Motors. The objective of the project is to predict the stock demand for each spare part required for the service and maintenance of the motorcycles. The expected outcome of the project is to help the company in purchasing inventory on the basis of understanding from the demand forecasting of the spare parts. The existing inventory management system of MR Motors is a software called Auto – Ordering Vector, which places the purchase order for spare parts that are required for the service and maintenance of the motorcycles. The vector compares the current stock count with the minimum stock count and then places the purchase order based on the difference in the stock of each spare part. The minimum stock count of the spare parts is fixed, which overlooks the varying nature of the stock demand, causing problems related to constant stock outs which may result in huge losses to the company. Therefore, MR Motors need an innovative solution to precisely analyze the stock demand trends and forecast the demand for spare parts to manage the inventory proficiently. This can be achieved by using machine learning algorithms, which will learn the historical trends in the data and provides dynamic output concerning the demand, unlike the existing system. Furthermore, the integration of the machine learning model with the vector will enhance the productivity of the vector without any human intervention.

DETAILED EXPLANATION OF ANALYSIS PROCESS:

The raw data collected from MR Motors contains a zip file and an excel sheet. The zip file contains 14 excel sheets, which are the month wise sales data of spare parts including other services like motorcycle washing, oil servicing and labor charges. The 14 job card invoice statements are structured data. The duration of the data collected is of 14 months from January 2022 to February 2023. Each row of the excel sheet contains the data of the individual spare part / service with respect to the customer. The customer details are continuously repeated in multiple rows when the customer purchases more than one spare part / service during a specific visit which is accounted in the same bill / invoice.

The job card invoice statement contains of the following columns:

- Invoice Number
- Insurance Invoice Number
- Invoice date
- Job Type
- Company Code
- Company Name
- City
- Customer Name
- Phone Number
- Model Code
- Model Name
- Job ID
- Job Card Date
- **Part Code**
- **Part Description**
- **Quantity**
- **Item Group**
- Price
- Discount
- Mode of payment
- GST
- Total Price

These are some of the important columns available in the excel sheets. Among them, we use the following columns for further analysis:

- Part Code

  Part code contains the unique code of the spare part / service.
- Part Description

  Part description contains the description of the spare part / service.
- Quantity

  Quantity contains the number of mentioned part consumed during the service.
- Item Group

  Item group contains the category of service such as oil, labor, spare part etc.,

The excel sheet contains the data of the auto – ordering vector. The rows of the excel sheet contains the data of individual spare parts and the minimum stock count for each spare part. The vector excel sheet only contains the spare part details that are available in the vector which are considered to be fast moving as per human intuition.

The vector excel sheet contains the following columns:

- **SKU Code**
- Description
- Location
- **Norm**
- Color
- Penetration
- Category
- Model

There are some of the important columns available in the excel sheet. Among them, we use the following column for further analysis:

- SKU Code

  SKU code contains the unique code of the spare part.
- Norm

  Norm is the minimum stock count of the spare part as per the existing system.

Hence, the following analysis process were done in job card invoice statements excel sheet to organize and analyze the data:

- The above – mentioned important columns from the current worksheet were copy pasted into a new worksheet for convenience.
- As the data contained the service details of motorcycle washing, oil servicing and labor charges, we need to clean the data and filter out the data that are related to spare parts sales details by applying the filter on the ‘item Group’ column using the ‘filter’ option in ‘sort & filter’ menu in excel.
- Now, we have to compute the sales of every spare part in a particular month using the ‘advanced’ option in ‘data’ menu and ‘sum’ formula in excel.
- The above – mentioned steps are repeated for all the 14 sheets to calculate the sales of each spare part from January 2022 to February 2023.
- The data which are in 14 separate excel sheets are consolidated in one excel sheet to get the spare part and its sales count from January 2022 to February 2023 in the same excel sheet.
- Now, the spare parts and its sales count of each month are in different columns and the spare parts are grouped by month due to which the spare parts are repeated.

- Hence, the unique records of the spare parts that were sold from January 2022 to February 2023 are consolidated month – wise in a new worksheet using the ‘advanced’ option in ‘data’ menu in excel.
- The sales count of each spare part are computed month – wise using the ‘vlookup’ formula in excel. Also, the cells with null (#N/A) value, which indicates that the particular spare part was not sold in the month, are replaced with 0.
- During manual inspection, we find that there are data entry errors due to which the sales count of few spare parts are in decimal, while the sales count of the spare parts can only take integer values.
- Those erroneous records were cross verified with the job card income statement and the corresponding data is either removed or deducted from the corresponding cells.
- Next, the annual, total sum, average monthly, average bi weekly, average weekly and average daily sales count for each spare part are calculated and rounded using the ‘sum’ and ‘roundup’ formula in excel. Here, for simplicity, we assume that there are 30 days and 5 weeks in a month.
- Now, we plot a ‘Month-wise Sales Trend of Top 10 Spare Parts’ line chart with the months and sales count as x and y axes respectively using the ‘insert chart’ option in ‘insert’ menu in excel. This line chart is included as Figure – 1.
- We also plot a ‘Annual Sales Trend of Top 30 Spare Parts’ pareto chart with the spare parts and sales count as x and y axes respectively using the ‘insert chart’ option in ‘insert’ menu in excel. This pareto chart is included as Figure – 2.
- We also plot a ‘Average Monthly Sales Trend of Top 15 Spare Parts’ pareto chart with the spare parts and sales count as x and y axes respectively using the ‘insert chart’ option in ‘insert’ menu in excel. This pareto chart is included as Figure – 3.
- We also plot a ‘Average Bi Weekly Sales Trend of Top 10 Spare Parts’ pareto chart with the spare parts and sales count as x and y axes respectively using the ‘insert chart’ option in ‘insert’ menu in excel. This pareto chart is included as Figure – 4.
- Now, after analyzing the data in ‘average bi weekly’ column, we can conclude that if the value of the corresponding cell of any spare part is less than 0.5, then it says that the demand of the corresponding spare part is less than 1 per month.
- Hence, we copy paste the top 98 spare parts month-wise spare parts sales data into a new worksheet and forecast the demand for each spare part for March, April and May 2023 with the data from January 2022 to February 2023 using the ‘forecast sheet’ option

in ‘data’ menu in excel. We choose only the top 98 spare parts because the average bi weekly value is greater than 0.5.

- We plot a ‘Distribution of Spare Parts’ pie chart with the spare parts to be included and spare parts that are not to be included as the slices using the ‘insert chart’ option in ‘insert’ menu in excel. This pie chart is included as Figure – 5.
- The ‘forecast sheet’ option in ‘data’ menu provides the forecast trend of the corresponding spare part along with the predicted value. The ‘forecast sheet’ also provides a line chart with the months and sales count as x and y axes respectively. This line chart is included as Figure – 6.
- We can also use the following formula to forecast the demand of spare parts:

  = FORECAST.ETS (target date, values, timeline)

  The above-mentioned formula and the forecast sheet predicts the future demand of each spare part based on the existing data of sales count of each spare part using Exponential Smoothing (ETS) algorithm. Exponential Smoothing technique is used to predict future sales, inventory requirements, or customer trends. The predicted value is a combination of the historical values in the specified target date, which should be a continuation of the timeline. This function requires the timeline to be organized with a constant step between the different points.
- Now, we plot a ‘Forecast Sheet of Monthly Demand of Top 5 Spare Parts’ line chart with the months and sales count as x and y axes respectively using the ‘insert chart’ option in ‘insert’ menu in excel. This line chart is included as Figure – 7.
- Further, we also plot a ‘Forecast Sheet of Bi Weekly Demand of Top 5 Spare Parts’ line chart with the months and sales count as x and y axes respectively using the ‘insert chart’ option in ‘insert’ menu in excel. This line chart is included as Figure – 8.

The following analysis process were done in vector excel sheet to organize and analyze the data:

- The above – mentioned important columns from the current worksheet were copy pasted into a new worksheet for convenience.
- The average monthly sales count and forecast data of april 2023 from job card invoice statement excel sheet were copy pasted and organized along with the important columns using the 'vlookup' formula in excel.
- Now, we compute the mean squared error, dead stock count and unavailability of spare part count using 'if' and 'sum' formula in excel.
- We can use the following formula to calculate the mean squared error between the norm data and forecast data:

  Mean Squared Error = $\frac{1}{n}\sum_{i=1}^{n}(Y_i - \hat{Y}_i)^2$

- We can use the following formula and add them using 'sum' formula in excel to calculate the dead stock count:

  = if (Norm > Forecast, Norm – Forecast, 0)

- We can use the following formula and add them using 'sum' formula in excel to calculate the count of unavailability of spare part:

  = if (Norm < Forecast, Forecast – Norm, 0)

- We also obtain the count of unnecessary spare parts that are included and necessary spare parts that aren't included in the auto – ordering vector.
- We plot a 'Distribution of Norm vs Average Sales Count of Top 10 Spare Parts' column chart with spare parts and stock quantity as x and y axes respectively using the 'insert chart' option in 'insert' menu in excel. This column chart is included as Figure – 9.
- We plot a 'Distribution of Norm vs Demand Forecast of Top 10 Spare Parts' column chart with spare parts and stock quantity as x and y axes respectively using the 'insert chart' option in 'insert' menu in excel. This column chart is included as Figure – 10.

RESULTS AND FINDINGS:

As per the analysis from the job card invoice statements and vector excel sheets, we can conclude the following results and findings with respect to the spare parts of the motorcycles and the auto – ordering vector:

- During the time period of 12 months from January 2022 to December 2022, a total of 15488 spare parts were sold.
- During the time period of 14 months from January 2022 to February 2023, a total of 17975 spare parts were sold.
- During the time period of 14 months from January 2022 to February 2023, 800 distinct spare parts were sold.
- During the time period of 14 months from January 2022 to February 2023, an average of 1284 spare parts were sold per month.
- During the time period of 14 months from January 2022 to February 2023, an average of 43 spare parts were sold per day.
- The number of spare parts that are to be included in the auto – ordering vector is 98. The number of spare of spare parts that are not to be included in the auto – ordering vector is 702.
- The number of spare parts that are already included in the auto – ordering vector is 398. The number of spare parts that are required to be included and are already included in the auto – ordering vector is 89.
- The number of spare parts that are required to be included and are not already included in the auto – ordering vector is 9. The number of spare parts are not required to be included yet are already included in the auto – ordering vector is 300.
- The mean squared error (MSE) between the norm data and forecast data of the spare parts is 52.5175. The forecast of the demand of spare parts was calculated using Exponential Smoothing technique.
- The expected number of dead stock of spare parts of the motorcycle is 1222 in every 15 days.
- The expected number of spare parts of the motorcycle that were unavailable when required are 18 in every 15 days.

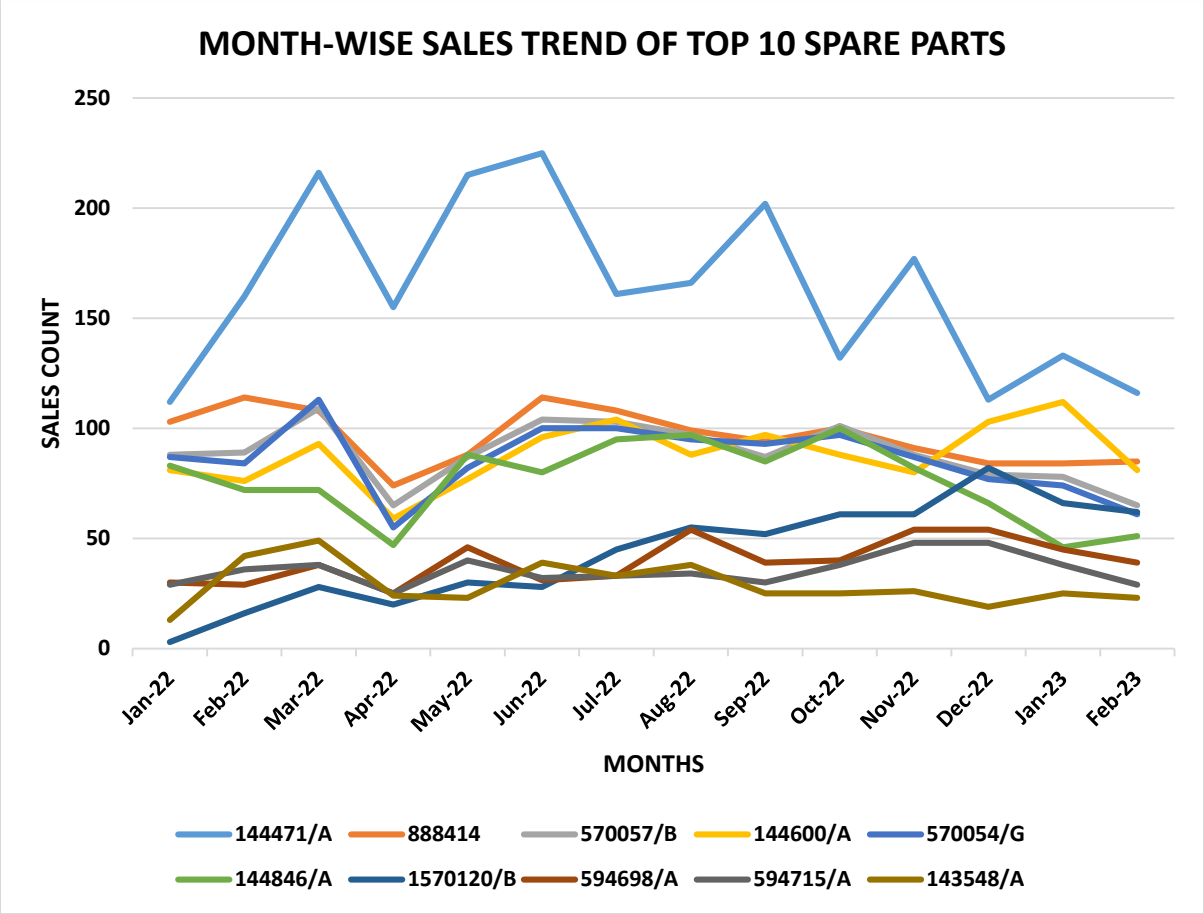

Figure – 1: Month-wise Sales Trend of Top 10 Spare Parts

The line chart in figure – 1 has months and sales count as x and y axes respectively. The line chart provides a visual understanding of the month-wise sales trend of top 10 spare parts of the motorcycles for the time period of 14 months from January 2022 to February 2023. We can infer from the chart that the trend of the spare parts varies with one another and the spare part 144471/A was sold the most in any given month. This chart can be used to understand the trends of a particular spare part of the motorcycles. In this chart, only top 10 spare parts are included in order to improve the readability of the chart.

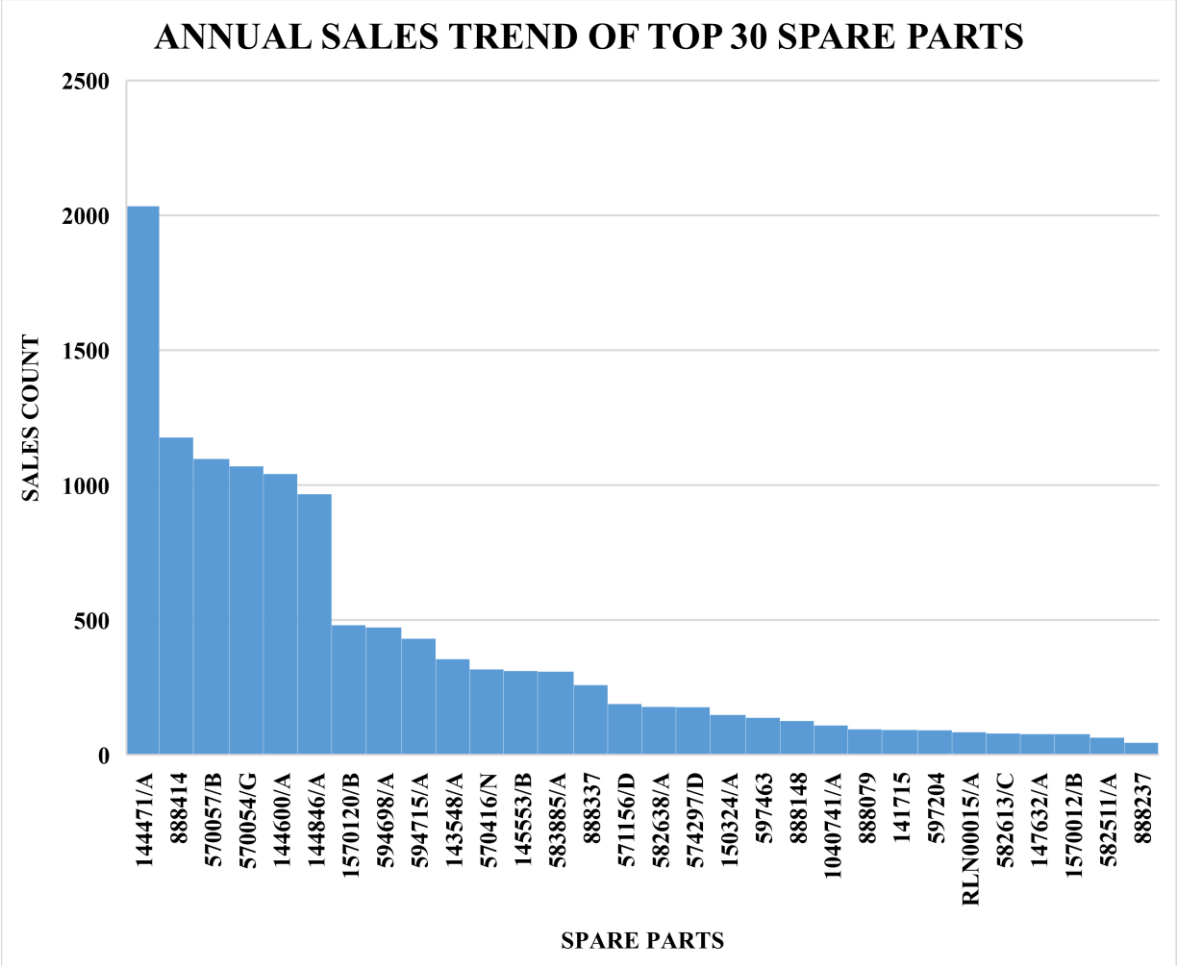

Figure – 2: Annual Sales Trend of Top 30 Spare Parts

The pareto chart in figure – 2 has spare parts and sales count as x and y axes respectively. The pareto chart provides a visual understanding of the annual sales trend of top 30 spare parts of motorcycles from January 2022 to December 2022. We can infer from the chart that the trend of the spare parts varies with one another and the spare part 144471/A was sold the most in any given month. The pareto chart provides the trend of the sales data of spare parts of the motorcycle in an ascending order of the sales data. This chart can be used to understand the trend of a particular spare part of the motorcycles. In this chart, only top 30 spare parts are included in order to improve the readability of the chart.

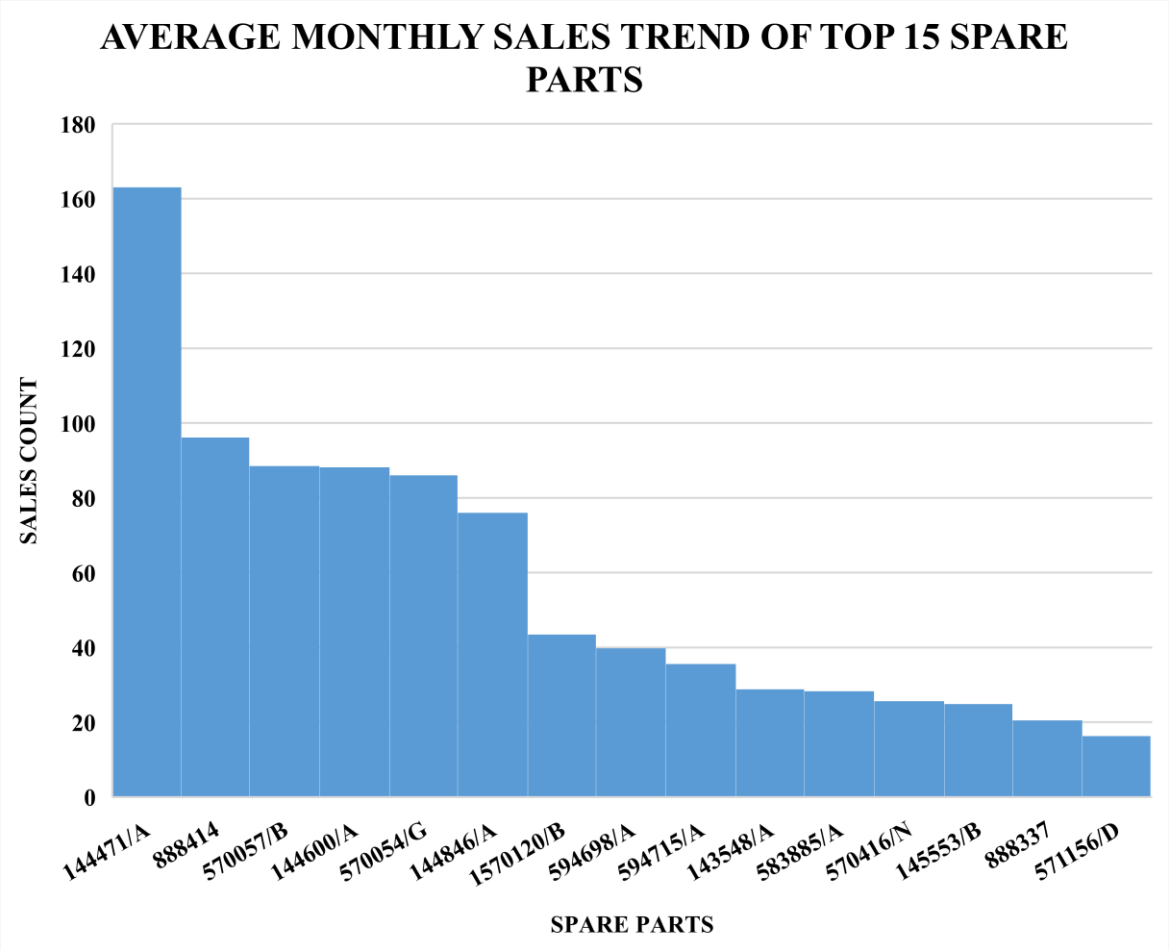

Figure – 3: Average Monthly Sales Trend of Top 15 Spare Parts

The pareto chart in figure – 3 has spare parts and sales count as x and y axes respectively. The pareto chart provides a visual understanding of the monthly sales trend of top 15 spare parts of the motorcycles. We can infer from the chart that the trend of the spare parts varies with one another and the spare part 144471/A was sold the most in any given month. The pareto chart provides the trend of the sales data of spare parts of the motorcycle in an ascending order of the sales data. This chart can be used to understand the trend of a particular spare part of the motorcycles. In this chart, only top 15 spare parts are included in order to improve the readability of the chart.

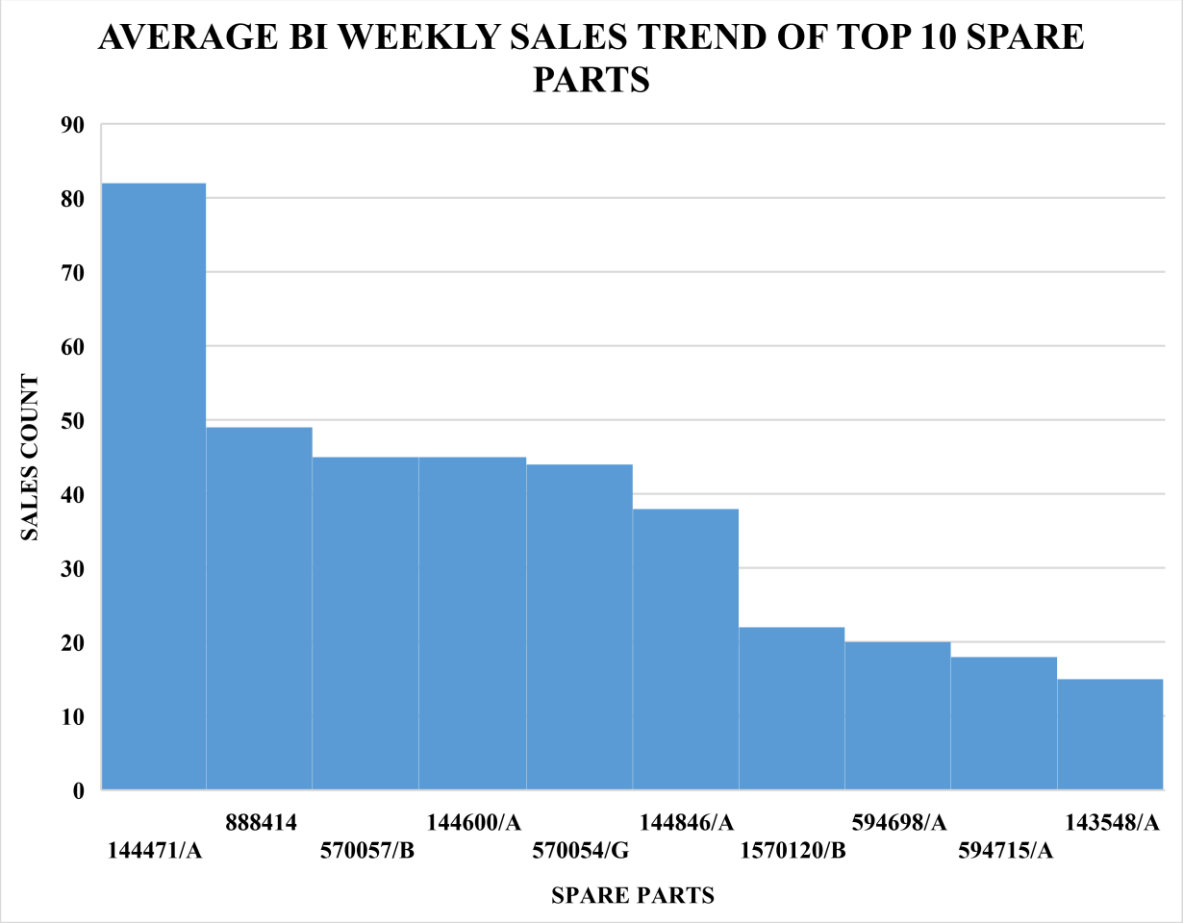

Figure – 4: Average Bi Weekly Sales Trend of Top 10 Spare Parts

The pareto chart in figure – 4 has spare parts and sales count as x and y axes respectively. The pareto chart provides a visual understanding of the bi weekly sales trend of top 10 spare parts of the motorcycles. We can infer from the chart that the trend of the spare parts varies with one another and the spare part 144471/A was sold the most in any given month. The pareto chart provides the trend of the sales data of spare parts of the motorcycle in an ascending order of the sales data. This chart can be used to understand the trend of a particular spare part of the motorcycles. In this chart, only top 10 spare parts are included in order to improve the readability of the chart.

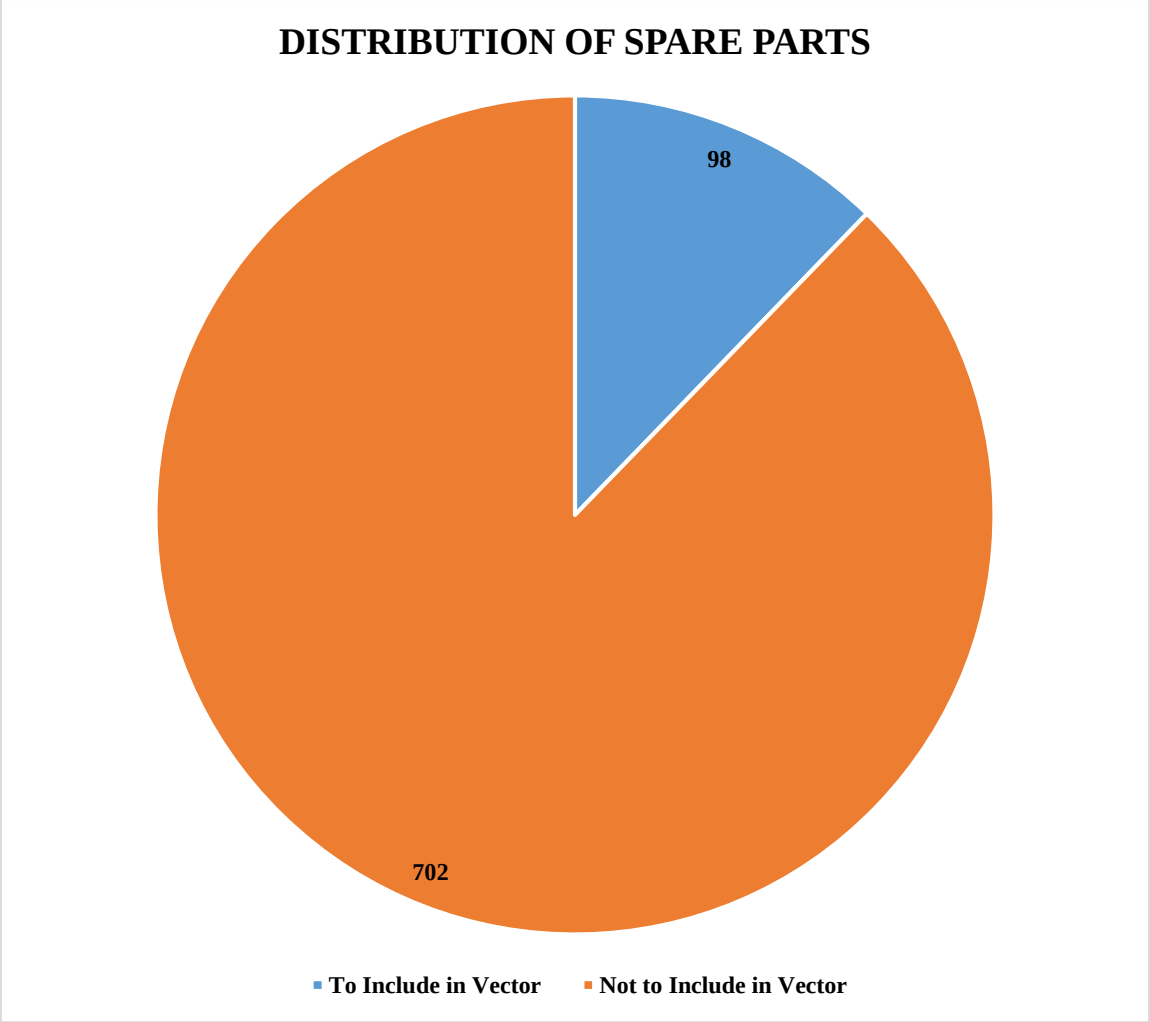

Figure – 5: Distribution of Spare Parts

The pie chart in figure – 5 has spare parts to be included and spare parts that are not to be included as the slices. The pie chart provides a visual understanding of the distribution of spare parts of the motorcycles that are to be included with respect to the entire inventory. If the value of average bi weekly sales count of any spare part is less than 0.5, then it says that the demand of the corresponding spare part is less than 1 per month. Hence, if the value of average bi weekly sales count of any spare part is less than 0.5, we don't include them in the vector, whereas, if the value of average bi weekly sales count of any spare part is greater than 0.5, we include them in the vector. Therefore, 98 spare parts are to be included in the vector.

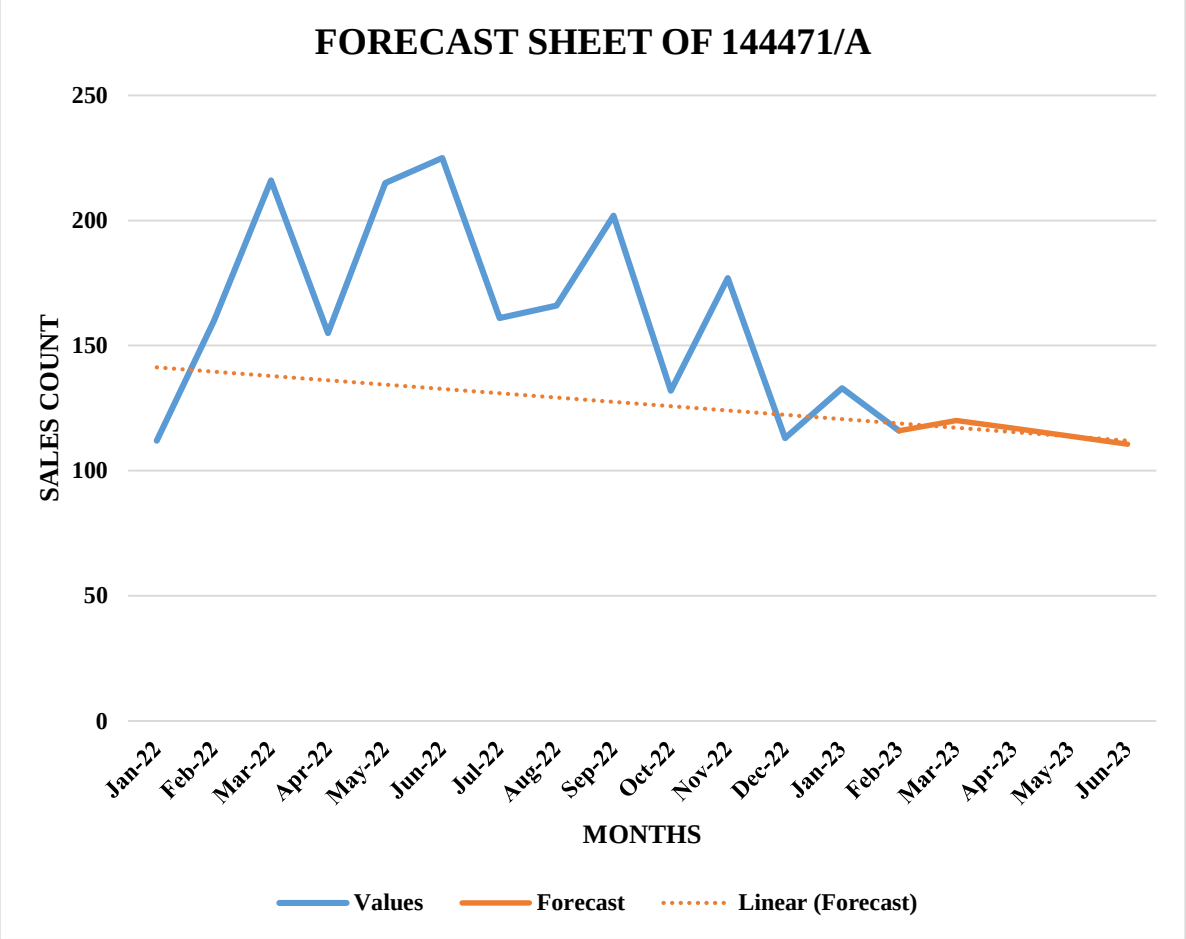

Figure – 6: Forecast Sheet of 144471/A

The line chart in figure – 6 has months and sales count as x and y axes respectively. The line chart provides a visual understanding of the forecast trend of a spare part along with the prediction of demand of the spare part. This chart can be used to understand the trends of a particular spare part of the motorcycles. The forecast sheet predicts the future demand of each spare part based on the existing data of sales count of each spare part using Exponential Smoothing (ETS) algorithm. Exponential Smoothing technique is used to predict future sales, inventory requirements, or customer trends. The predicted value is a combination of the historical values in the specified target date, which should be a continuation of the timeline. This function requires the timeline to be organized with a constant step between the different points.

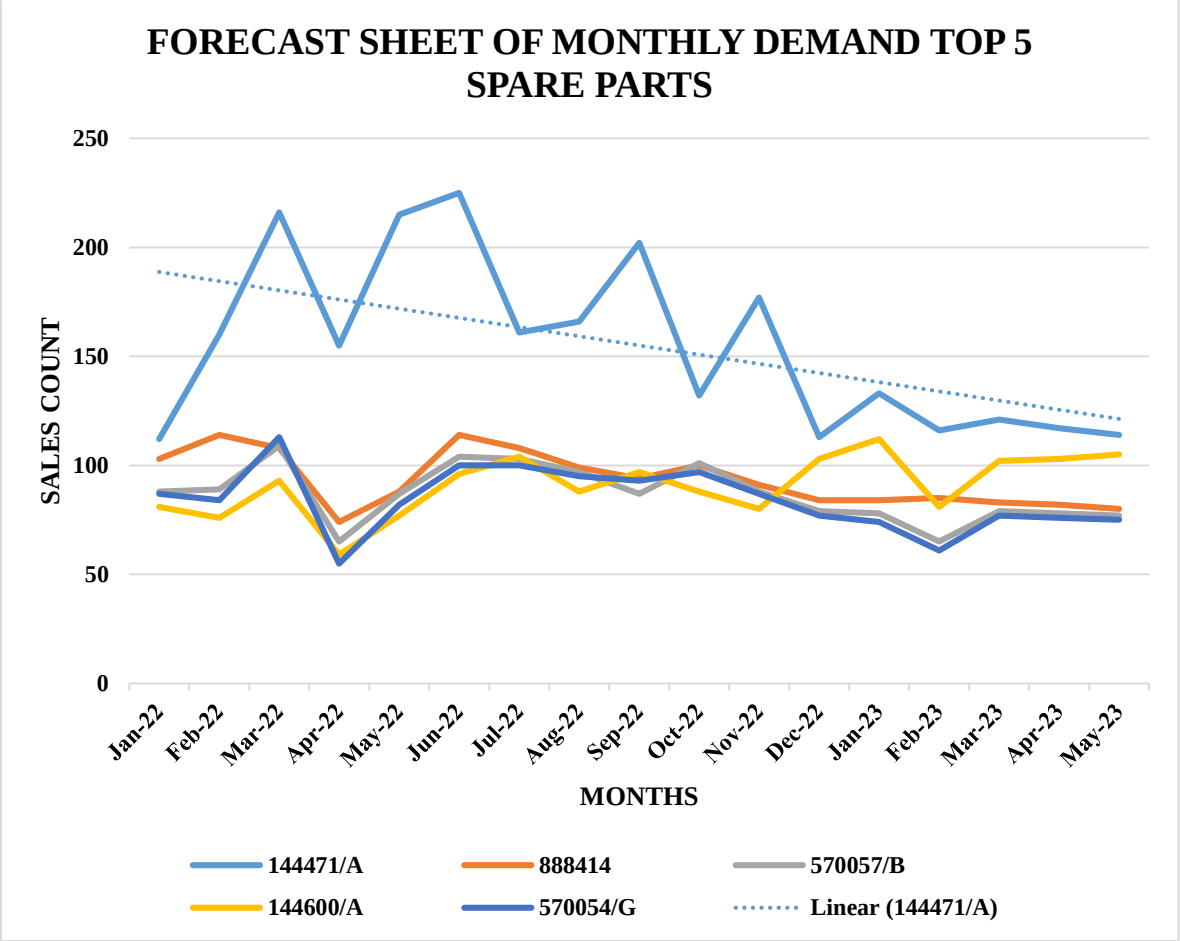

Figure – 7: Forecast Sheet of Monthly Demand of Top 5 Spare parts

The line chart in figure – 7 has months and sales count as x and y axes respectively. The line chart provides a visual understanding of the forecast trend of monthly demand of top 5 spare parts along with the prediction of demand of the spare parts. We can infer from the chart that the trend of the spare parts varies with one another and the spare part 144471/A was sold the most in any given month. This chart can be used to understand the trends of a particular spare part of the motorcycles. In this chart, only top 5 spare parts are included in order to improve the readability of the chart. The forecast sheet predicts the future demand of each spare part based on the existing data of sales count of each spare part using Exponential Smoothing (ETS) algorithm. Exponential Smoothing technique is used to predict future sales, inventory requirements, or customer trends. The predicted value is a combination of the historical values in the specified target date, which should be a continuation of the timeline. This function requires the timeline to be organized with a constant step between the different points.

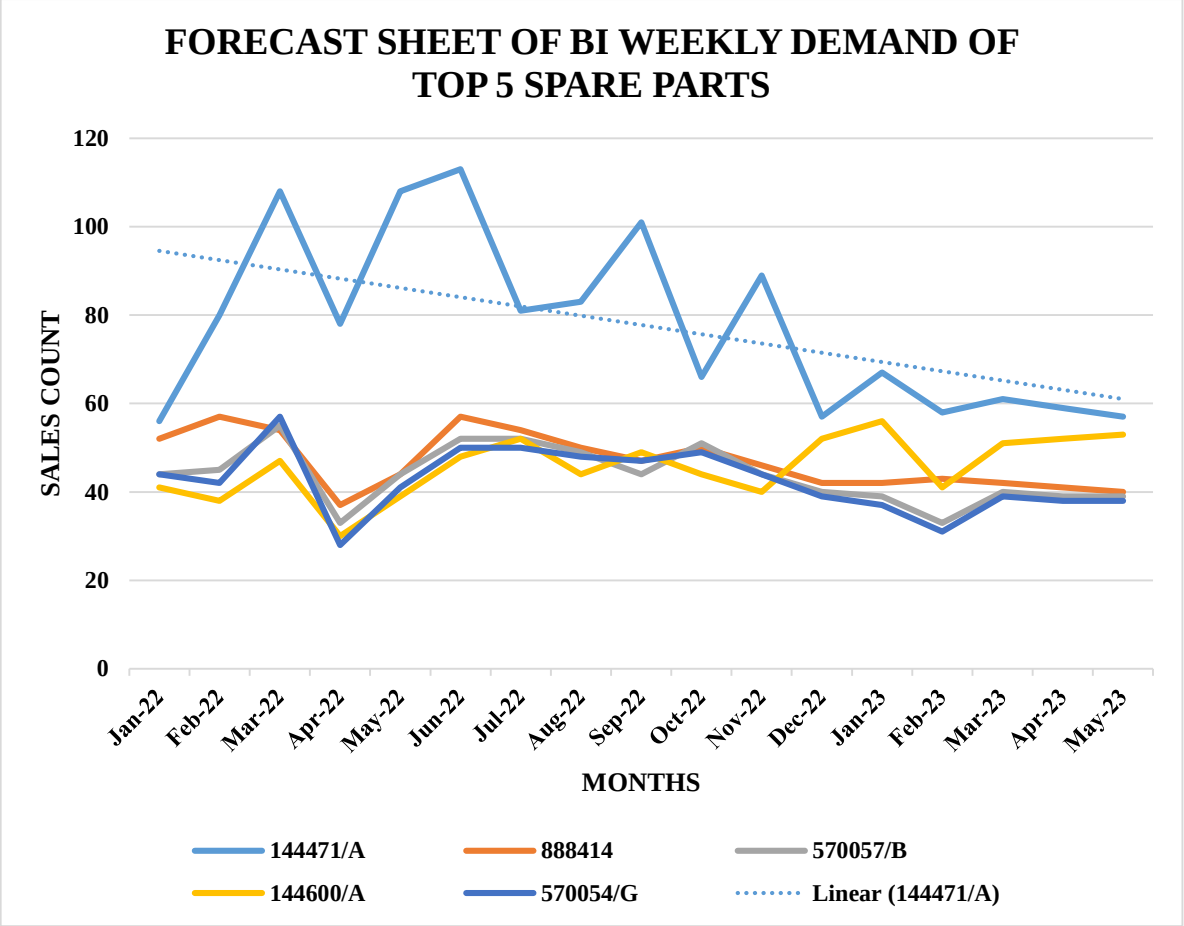

Figure – 8: Forecast Sheet of Bi Weekly Demand of Top 5 Spare parts

The line chart in figure – 8 has months and sales count as x and y axes respectively. The line chart provides a visual understanding of the forecast trend of bi weekly demand of top 5 spare parts along with the prediction of demand of the spare parts. We can infer from the chart that the trend of the spare parts varies with one another and the spare part 144471/A was sold the most in any given month. This chart can be used to understand the trends of a particular spare part of the motorcycles. In this chart, only top 5 spare parts are included in order to improve the readability of the chart. The forecast sheet predicts the future demand of each spare part based on the existing data of sales count of each spare part using Exponential Smoothing (ETS) algorithm. Exponential Smoothing technique is used to predict future sales, inventory requirements, or customer trends. The predicted value is a combination of the historical values in the specified target date, which should be a continuation of the timeline. This function requires the timeline to be organized with a constant step between the different points.

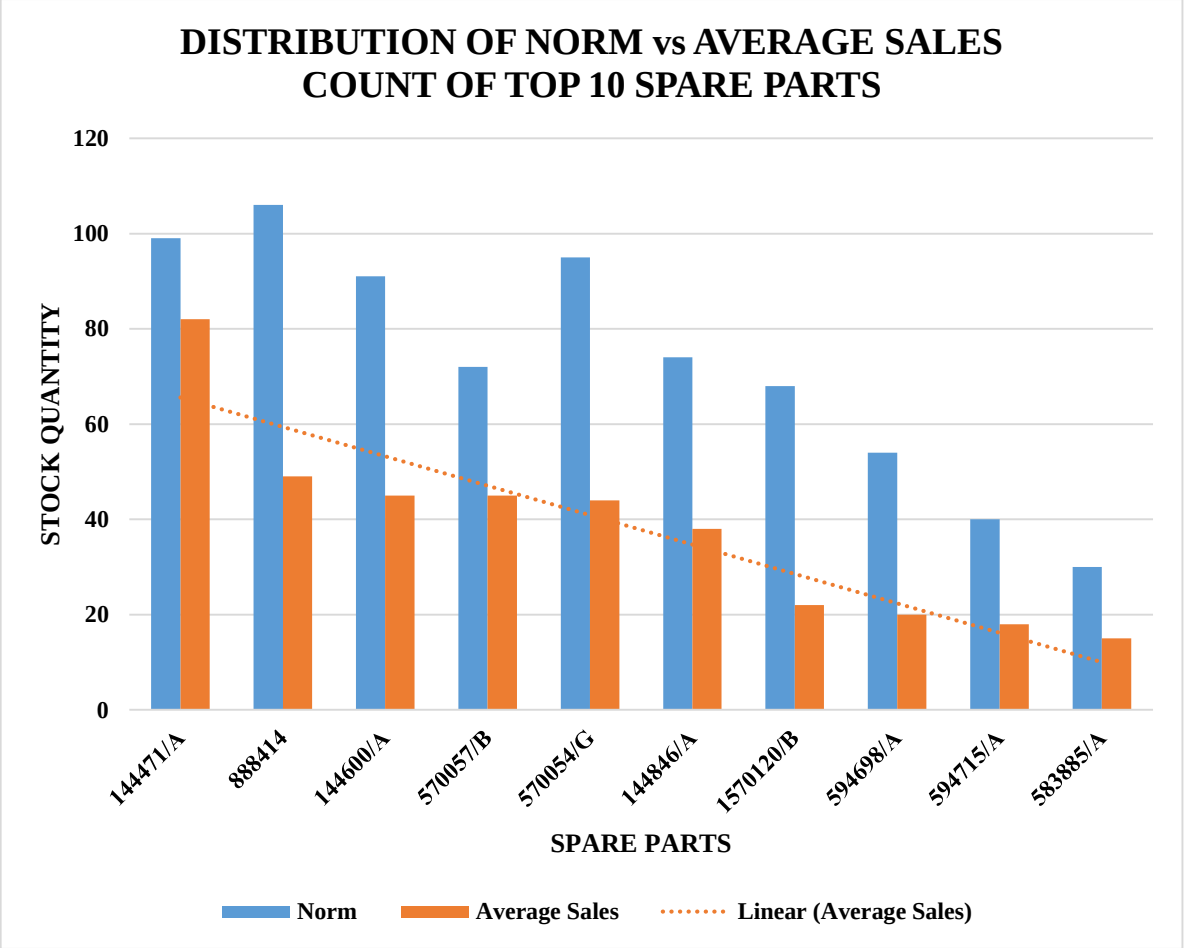

Figure – 9: Distribution of Norm vs Average Sales Count of Top 10 Spare Parts

The column chart in figure – 9 has spare parts and stock quantity as x and y axes respectively. The column chart provides a visual understanding of the distribution of norm and average sales count of top 10 spare parts of the motorcycles. This chart can be used to understand the trends of the spare parts of the motorcycles. In this chart, only top 10 spare parts are included in order to improve the readability of the chart. Here, Norm is the minimum stock count of the spare parts. The forecast data is obtained using Exponential Smoothing (ETS) algorithm. Exponential Smoothing technique is used to predict future sales, inventory requirements, or customer trends. The predicted value is a combination of the historical values in the specified target date, which should be a continuation of the timeline. This function requires the timeline to be organized with a constant step between the different points.

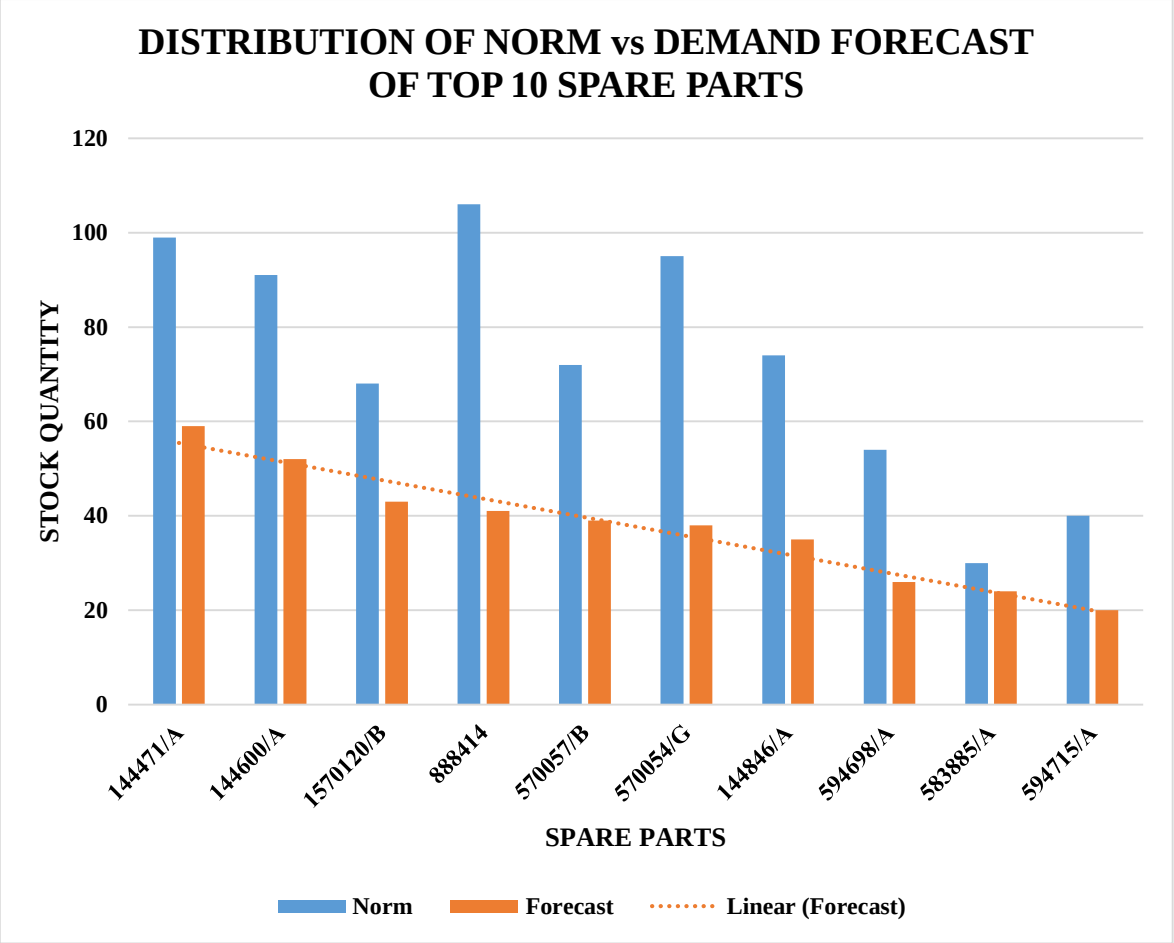

Figure – 10: Distribution of Norm vs Demand Forecast of Top 10 Spare Parts

The column chart in figure–10 has spare parts and stock quantity as x and y axes respectively. The column chart provides a visual understanding of the distribution of norm and demand forecast of top 10 spare parts of the motorcycles. This chart can be used to understand the trends of the spare parts of the motorcycles. In this chart, only top 10 spare parts are included in order to improve the readability of the chart. Here, Norm is the minimum stock count of the spare parts. The forecast data is obtained using Exponential Smoothing (ETS) algorithm. Exponential Smoothing technique is used to predict future sales, inventory requirements, or customer trends. The predicted value is a combination of the historical values in the specified target date, which should be a continuation of the timeline. This function requires the timeline to be organized with a constant step between the different points.

Spare Parts	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23
144471/A	56	80	108	78	108	113	81	83	101	66	89	57	67	58	61	59	57
888414	52	57	54	37	44	57	54	50	47	50	46	42	42	43	42	41	40
570057/B	44	45	55	33	44	52	52	49	44	51	44	40	39	33	40	39	39
144600/A	41	38	47	30	39	48	52	44	49	44	40	52	56	41	51	52	53
570054/G	44	42	57	28	41	50	50	48	47	49	44	39	37	31	39	38	38
144846/A	42	36	36	24	44	40	48	49	43	50	41	33	23	26	35	35	34
1570120/B	2	8	14	10	15	14	23	28	26	31	31	41	33	31	40	43	46
594698/A	15	15	19	13	23	16	17	27	20	20	27	27	23	20	26	26	27
594715/A	15	18	19	13	20	16	17	17	15	19	24	24	19	15	20	20	21
143548/A	7	21	25	12	12	20	17	19	13	13	13	10	13	12	12	11	11
583885/A	3	0	19	12	14	5	22	18	18	14	20	13	22	23	30	24	33
570416/N	12	11	16	10	15	18	15	16	18	11	12	8	11	10	11	11	10
145553/B	11	10	16	9	15	21	15	16	17	8	10	9	10	9	10	10	10
888337	7	19	19	9	9	15	8	9	12	8	12	5	9	6	6	6	5
571156/D	2	10	11	5	7	13	13	10	6	6	6	8	10	11	11	11	11
574297/D	7	6	7	6	8	5	11	12	7	4	8	11	8	9	11	11	10
150324/A	0	5	7	6	13	8	4	5	5	7	8	8	10	14	12	12	13
582638/A	6	2	8	4	9	13	9	15	9	6	6	5	4	5	6	6	6
597463	7	6	7	5	4	8	6	7	9	3	5	4	5	4	5	5	4
888148	4	2	7	2	9	9	7	6	7	5	5	3	4	5	5	5	5
1040741/A	2	7	7	5	7	4	4	7	4	5	4	2	4	5	4	3	5
597204	2	3	5	4	3	6	6	5	6	3	2	4	4	5	4	5	5
582511/A	0	0	0	1	0	0	5	0	4	4	11	10	8	15	13	13	14

Figure – 11: Inventory Demand Forecasting of Spare Parts of the Motorcycles

The excel sheet in figure – 11 has months and spare parts as columns and rows respectively. The cells in the column where the months indicated in **blue** are the sales data that were collected from MR Motors, while the months indicated in **orange** are the demand data that are predicted using the sales data. The forecast sheet predicts the future demand of each spare part based on the existing data of sales count of each spare part using Exponential Smoothing (ETS) algorithm. Exponential Smoothing technique is used to predict future sales, inventory requirements, or customer trends. The predicted value is a combination of the historical values in the specified target date, which should be a continuation of the timeline. This function requires the timeline to be organized with a constant step between the different points.

INTERPRETATION OF RESULTS AND RECOMMENDATIONS:

As per the analysis from the job card invoice statements and vector excel sheets, as well as the conclusion of results and findings with respect to the spare parts of the motorcycles and the auto – ordering vector, we can interpret the results from the previous section and provide the following recommendations to MR Motors regarding inventory demand forecasting:

- The number of spare parts that are to be included in the auto – ordering vector is an important parameter as it plays a vital role in the efficiency of the auto – ordering vector. Moreover, the auto – ordering vector can be utilized to the best of its abilities, if the auto – ordering vector contains only those spare parts that are absolutely necessary, instead of including all the available spare parts in the auto – ordering vector.
- From the analysis of the data in 'average bi weekly' column of the job card invoice statements excel sheet and figures 1 – 5, we can conclude that if the value of the corresponding cell of any spare part is less than 0.5, then it says that the demand of the corresponding spare part is less than 1 per month.
- Hence, if the value of 'average bi weekly' sales count of any spare part is less than 0.5, we don't include them in the vector, whereas, if the value of average bi weekly sales count of any spare part is greater than 0.5, we include them in the vector.
- According to figure – 5, we can infer that 98 spare parts have 'average bi weekly' sales count to be more than 0.5. Therefore, **it is recommended that these 98 spare parts are to be included in the auto – ordering vector.**
- As a result, the number of spare parts that are to be included in the auto – ordering vector is 98. The number of spare of spare parts that are not to be included in the auto – ordering vector is 702.
- The number of spare parts that are already included in the auto – ordering vector is 398. The number of spare parts that are required to be included and are already included in the auto – ordering vector is 89.
- The number of spare parts that are required to be included and are not already included in the auto – ordering vector is 9. The number of spare parts are not required to be included yet are already included in the auto – ordering vector is 300.
- From the analysis of vector excel sheet and figure – 9 & 10, we can infer that the existing inventory demand of the spare parts in the auto – ordering vector are erroneous. Because, from the all the figures along the descriptive statistics, we can determine that the most sold spare part of every month is 144471/A, but the demand (or) norm for

144471/A is 99 every 15 days, whereas, the highest demand value in the vector is 106 every 15 days and is of the spare part 888414. But, the actual demand of the spare part 888414 is 41 every 15 days.

- Hence, the norm, which is the minimum stock count of the spare part followed by the existing system of MR Motors, needs to be optimized based on the current trend in demand of the corresponding spare part. Therefore, **it is recommended that the values of norm are revised based on the analysis of the inventory demand.**
- The inventory demand forecasting of spare parts can be done to predict the future demand of each spare part based on the existing data of sales count of each spare part using Exponential Smoothing (ETS) algorithm, which is visually represented in the figure -11.
- The mean squared error (MSE) between the norm data and forecast data of the spare parts is 52.5175, which explains the risk function corresponding to the existing norm data.
- On further analysis, it is identified that the expected number of dead stock of spare parts of the motorcycle is 1222 in every 15 days and the expected number of spare parts of the motorcycle that were unavailable when required are 18 in every 15 days.
- Therefore, **it is recommended that the norm values of the auto – ordering vector is revised based on the forecast of inventory demand of the spare parts.**

In conclusion, the minimum stock count of the spare parts in the existing inventory management system of MR Motors is fixed, which overlooks the varying nature of the stock demand, causing problems related to constant stock outs which may result in huge losses to the company. Henceforth, MR Motors need an innovative solution to precisely analyze and forecast the demand for spare parts to manage the inventory proficiently. This is achieved by using machine learning algorithms, which learn the trends in the historical data and provides dynamic output concerning the demand, unlike the existing system. Furthermore, the integration of the machine learning model with the vector enhances the productivity of the vector without any human intervention. Thereby, saving a lot of capital and decreasing the chance of stock outs in terms of excess or deficit inventory. Therefore, Mr. Mahesh doesn't have to worry about investment strategy concerning inventory stock demand as the model optimizes and maximizes the profit of the business. Ultimately, the objective and the expected outcome of the project have been attained and accomplished.