WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

THE STUDY ON DEMAND ANALYSIS AND INVENTORY MANAGEMENT IN BREAKS INDIA

V.MOHNISH KUMAR[1] & DR. R.JAYARANI[2]

[1]MBA Student, School of Management Studies,
Sathyabama Institute of Science and Technology, Chennai,,Tamil Nadu, India
[2]Assistant Professor, School of Management Studies, Sathyabama Institute of Science and Technology, Chennai, Tamil Nadu, India

ABSTRACT :

The study at Brakes India Pvt Ltd focuses on analyzing demand patterns and optimizing inventory management techniques to enhance operational efficiency. Objectives include conducting demand analysis, optimizing inventory levels, establishing safety stock protocols, and promoting continuous improvement. By addressing these needs, the project aims to enhance inventory practices, accurately forecast demand, mitigate risks, and foster a culture of continuous improvement throughout the supply chain.

KEY WORDS

- Demand patterns
- Inventory management
- Operational efficiency
- 4
- Forecasting
- Inventory optimization
- Safety stock management
- ABC analysis
- Supply chain coordination
- Performance measurement
- Continuous improvement

INTRODUCTION:

Demand analysis involves researching customer demand for products/services to inform various business decisions like sales forecasting, pricing, marketing, and expansion planning. Inventory management entails determining when and how much stock to order, tracking inventory from purchase to sale, and ensuring optimal stock levels to fulfill customer orders while avoiding excess stock that ties up cash flow. Effective inventory management is measured by inventory turnover, reflecting how often stock is sold in a period to prevent deadstock and optimize cash flow.

OBJECTIVE:

Primary Objective:

1. Conduct a comprehensive study on demand and inventory techniques specific to Brakes India Pvt Ltd.

Secondary Objectives:

1. Perform demand analysis and forecasting by analyzing historical sales and market trends to forecast future demand accurately.
2. Optimize inventory by determining optimal inventory levels considering forecasts and lead times, balancing holding costs and stockout risks.
3. Manage safety stock by establishing appropriate levels to mitigate demand variability and supply chain disruptions effectively.
4. Utilize ABC analysis to classify inventory items based on value and usage, prioritizing management efforts accordingly.

5. Measure inventory performance using key metrics such as inventory turnover, fill rate, stockout rates, and days of inventory on hand to evaluate and improve inventory management practices.

SCOPE OF THE STUDY

1. Analyse past sales, market trends, and customer behavior for accurate demand forecasts.
2. Optimize inventory levels based on forecasts and cost considerations to minimize expenses.
3. Set safety stock levels to handle demand and supply uncertainties.
4. Prioritize inventory items by value and usage to allocate resources effectively.
5. Coordinate with suppliers and distributors to improve supply chain efficiency.
6. Track inventory performance using key metrics for continuous improvement.
7. Cultivate a culture of ongoing improvement in inventory management practices.

NEED FOR THE STUDY

- nventory Management Improvement: The project aims to enhance inventory management practices to optimize inventory levels, reduce holding costs, and improve overall efficiency.
- Demand Analysis and Forecasting: There is a need to analyze historical sales data, market trends, and customer behavior to accurately forecast future demand and anticipate inventory requirements.
- Supply Chain Coordination: Collaborating with suppliers and distributors to improve visibility, coordination, and responsiveness throughout the supply chain is crucial for efficient inventory management.
- Risk Mitigation: Establishing safety stock levels to buffer against demand variability and supply chain disruptions is essential to mitigate the risk of stockouts and ensure high service levels.
- Performance Measurement: Establishing key performance indicators (KPIs) and metrics to measure inventory performance is necessary to identify inefficiencies, areas for improvement, and opportunities for optimization.
- Continuous Improvement: Implementing a culture of continuous improvement in inventory management processes, systems, and practices is vital for adapting to changing market conditions and improving operational efficiency over time.

LITERATURE REVIEW

- Smith and Lee (2018) delve into the role of inventory management in the retail sector, emphasizing the significance of optimizing stock levels to enhance customer satisfaction and reduce operational costs. They discuss how retailers can leverage technology and data analytics to achieve efficient inventory control and improve profitability.
- Gupta et al. (2015) explore the impact of inventory management on supply chain resilience in the manufacturing industry. Their research highlights the importance of proactive inventory strategies in mitigating risks and disruptions, thereby ensuring continuity in production and customer service.
- Kim and Patel (2019) investigate the adoption of inventory management best practices in the e-commerce sector. They discuss how online retailers can optimize inventory levels, streamline order fulfilment processes, and enhance the overall customer experience to gain a competitive edge in the digital marketplace.

RESEARCH DESIGN

- The research design for the project involves a combination of qualitative and quantitative methods to gather data and insights related to inventory management, demand analysis, and supply chain coordination data are collected for 2019-2023

RESEARCH METHODOLOGY

1) Qualitative Methods:

Observations: Observe inventory management processes and supply chain interactions firsthand to identify inefficiencies, bottlenecks, and areas for improvement

2) Quantitative Methods:

1. **Historical Data Analysis:** Analyse historical sales data, inventory records, and supply chain performance metrics to identify patterns, trends, and correlations**.**
2. **Statistical Analysis:** Conduct statistical analysis to model demand forecasts, calculate safety stock levels, and optimize inventory parameters based on historical data and demand patterns.

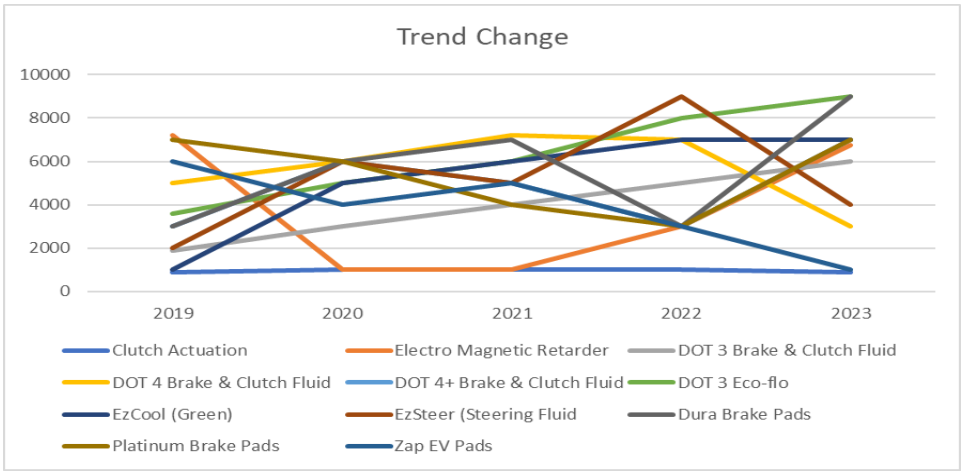
RESEARCH TOOLS:

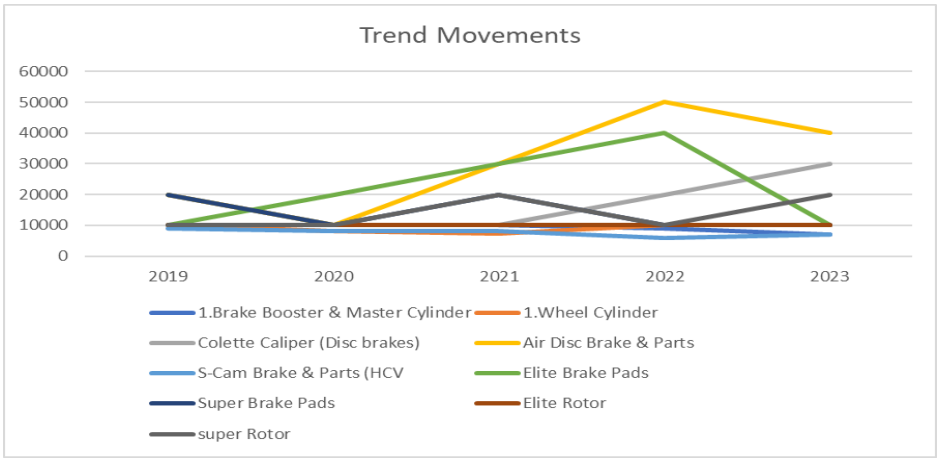
1. Trend analysis
2. ABC analysis
3. Economic Order quantity
4. Safety stock levels
5. Risk mitigation

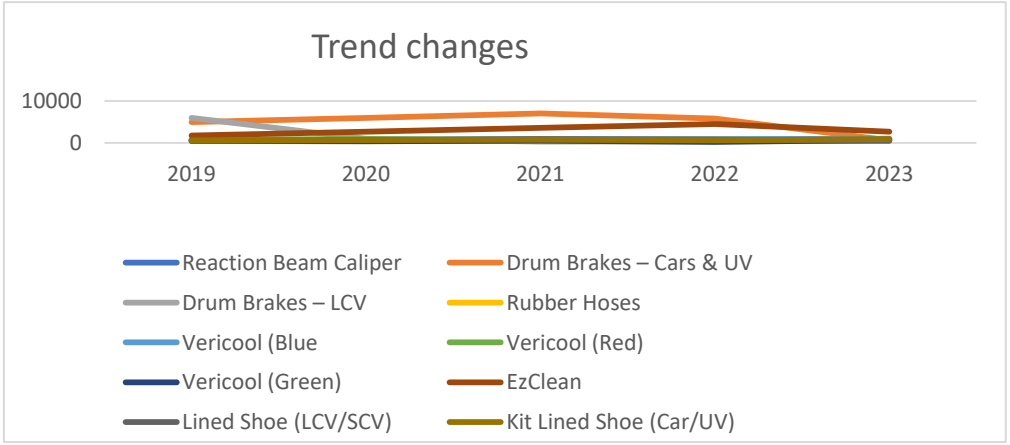
DATA ANALYSIS

TREND ANALYSIS

Trend analysis identifies and analyzes patterns in data over time, revealing trends such as upward or downward movements and recurring patterns. It can be applied to various data types, like financial, sales, and demographic data, aiming to understand underlying factors and make predictions about future trends. Valuable for businesses, investors, and policymakers, trend analysis aids in comprehending market dynamics and planning accordingly.







ABC ANALYSIS

The ABC analysis is done on the basis of over all movement of goods on last five years according to the movement abc has been classified .For the a classified products

GROUP A

Product	Opening Stock	Current Assets
Electro Magnetic Retarder	8000	120,000,000
Platinum Brake Pads	7200	10,800,000
Dura Brake Pads	3650	912,500
Zap EV Pads	6300	9,450,000
DOT 4 Brake & Clutch Fluid	5200	1,560,000
EzSteer (Steering Fluid)	2300	805,000
DOT 4+ Brake & Clutch Fluid	3920	980,000
DOT 3 Eco-flo	4000	1,400,000
EzCool (Green)	1300	208,000
Clutch Actuation	1000	1,530,000
DOT 3 Brake & Clutch Fluid	2000	400,000

GROUP C

Product	Opening Stock	Current Assets
Electro Magnetic Retarder	1600	24,000,000
Platinum Brake Pads	6300	9,450,000
Clutch Actuation	1230	1,881,900
Dura Brake Pads	6500	2,080,000
DOT 3 Eco-flo	5300	1,855,000
DOT 4+ Brake & Clutch Fluid	6320	1,580,000
DOT 4 Brake & Clutch Fluid	6300	1,890,000
EzSteer (Steering Fluid)	6200	2,170,000
EzCool (Green)	5400	864,000
DOT 3 Brake & Clutch Fluid	3200	640,000
Zap EV Pads	4230	634,500

Product	Opening Stock	Current Assets
Drum Brakes – LCV	450	3,600,000
Drum Brakes – LCV	320	2,560,000
Lined Shoe (LCV/SCV)	630	1,379,700
Vericool (Red)	920	570,400
EzClean	3000	1,650,000
Reaction Beam Caliper	530	1,590,000
Kit Lined Shoe (Car/UV)	760	1,664,400

Product	ORDER COST	COST PER UNIT	SALES	EOQ
Reaction Beam Caliper	2280000	3000	33,150	227.65

Product	Opening Stock	Current Assets
Kit Lined Shoe (Car/UV)	950	2,080,500
Drum Brakes – Cars & UV	600	18,200,000
Kit Lined Shoe (Car/UV)	1100	247,500

Economic Order Quantity (EOQ)

Economic Order Quantity (EOQ) is a key concept in inventory management, determining the optimal order quantity to minimize total inventory costs by balancing ordering and holding costs. It utilizes a mathematical model considering factors like ordering costs, holding costs, and demand rates to enhance efficiency and cost-effectiveness in inventory management.

Drum Brakes – Cars & UV	145600000	26000	40,850	3.29
Drum Brakes – LCV	52320000	8000	61,500	5.45
Rubber Hoses	325000	500	1,38,100	82.89
Vericool (Blue)	168750	225	14,950	126.89
Vericool (Red)	191250	225	78,400	306.44
Vericool (Green)	336000	365	3,580	31.35
EzClean	350000	427.439	13,525	38.82
Lined Shoe (LCV/SCV)	1100000	550	17,450	56.92
Kit Lined Shoe (Car/UV)	1512000	2700	14,040	11.42
Brake Booster & Master Cylinder	348000000	30000	2,680	8.97
Wheel Cylinder	8150000	500	15,500	63.25
Colette Caliper (Disc brakes)	57500000	2500	31,575	59.57
Air Disc Brake & Parts	91000000	3500	33,500	51.47
S-Cam Brake & Parts (HCV)	33600000	3500	41,125	32.01
Elite Brake Pads	27440000	1400	23,250	31.53
Super Brake Pads	20930000	910	31,900	44.54
Elite Rotor	21060000	1620	53,600	24.51
Super Rotor	29400000	2100	1,170	30.47
Clutch Actuation	15000000	15000	10,915	19.57
Electro Magnetic Retarder	560000000	37333.33	8,660	42.29
DOT 3 Brake & Clutch Fluid	3700000	462.5	7,650	24.43
DOT 4 Brake & Clutch Fluid	6281600	12563.2	9,220	16.45
DOT 4+ Brake & Clutch Fluid	28498400	126657.8	6,160	7.48
DOT 3 Eco-flo	100000	76.923	716	7.97
EzCool (Green)	208000	90.435	823	13.61
EzSteer (Steering Fluid)	805000	251.562	750	11.96
Dura **Brake** Pads	1024000	142	360	24.5
Platinum Brake Pads	2170000	345	920	30.2
Zap EV Pads	2080000	220	893	19.6

The Reorder Point (ROP)

The Reorder Point (ROP) is pivotal in determining the safety stock level to mitigate stockout risks. It signifies the inventory level at which a new order should be placed to maintain adequate stock during lead time. Calculated as (Demand × Lead Time) + Safety Stock, ROP ensures sufficient inventory to cover demand uncertainties and replenishment delays.

GROUP A

Product	Opening Stock	Avg. Demand During Lead Time	Safety Stock	ROP
Electro Magnetic Retarder	8000	8000	800	8800
Platinum Brake Pads	7200	7200	720	7920
Dura Brake Pads	3650	3650	365	4015

Product	Opening Stock	Avg. Demand During Lead Time	Safety Stock	ROP
Zap EV Pads	6300	6300	630	6930
DOT 4 Brake & Clutch Fluid	5200	5200	520	5720
EzSteer (Steering Fluid)	2300	2300	230	2530
DOT 4+ Brake & Clutch Fluid	3920	3920	392	4312
DOT 3 Eco-flo	4000	4000	400	4400
EzCool (Green)	1300	1300	130	1430
Clutch Actuation	1000	1000	100	1100
DOT 3 Brake & Clutch Fluid	2000	2000	200	2200

Interface:

- this tabular alignment is done on basis of abc analysis
- The safty stock level is 10%because of it company nature
- ROP is necessary to find the demand of the product and for further production for the product

GROUP B

Product	ROP	Safety Stock Level
Clutch Actuation	1100	100
Electro Magnetic Retarder	8800	800
DOT 3 Brake & Clutch Fluid	2200	200
DOT 4 Brake & Clutch Fluid	5720	520
DOT 4+ Brake & Clutch Fluid	4312	392
DOT 3 Eco-flo	1430	130
EzCool (Green)	2530	230
EzSteer (Steering Fluid)	3520	320
Dura Brake Pads	7920	720
Platinum Brake Pads	6930	630
Zap EV Pads	4653	423

INTERFACE:

- this tabular allingement is done on basis of abc analysis
- The safty stock level is 10%because of it company nature
- ROP is necessary to find the demand of the product and for further production for the product

GROUP C

Product	ROP	Safety Stock Level
Reaction Beam Caliper	820	50
Drum Brakes – Cars & UV	1230	70
Drum Brakes – LCV	320	20
Rubber Hoses	920	50

Product	ROP	Safety Stock Level
Vericool (Blue)	650	50
Vericool (Red)	600	30
Vericool (Green)	1000	100
EzClean	1100	100
Lined Shoe (LCV/SCV)	800	60
Kit Lined Shoe (Car/UV)	960	90

INTERFACE:

- this tabular allingement is done on basis of abc analysis
- The safty stock level is 10%because of it company nature
- ROP is necessary to find the demand of the product and for further production for the product

RISK MITIGATION

Risk mitigation involves proactive measures aimed at reducing the likelihood and impact of potential risks on a project or organization. It begins with identifying and assessing risks, followed by the development and implementation of strategies to address them. By effectively managing risks, organizations can minimize the probability of negative outcomes, protect assets, and enhance overall project success. Continuous monitoring and improvement are integral to the risk mitigation process, ensuring that strategies remain relevant and effective in the face of evolving threats and uncertainties.

GROUP A

Item	Risk Exposure	Mitigation Actions	Reduction Percentage	Risk Reduction
Brake Booster & Master Cylinder	10000	Implement tighter inventory control measures. - Diversify suppliers to mitigate supply chain risks. - Regular maintenance and quality checks to prevent stock losses.	30%	3000
Wheel Cylinder	10000	Improve forecasting accuracy to minimize overstock or stockouts. - Implement just-in-time inventory practices. - Regular inspections to detect and address any issues promptly.	25%	2500
Colette Caliper (Disc brakes)	10000	Enhance supplier relationships to ensure timely delivery of components. - Implement quality control measures to reduce defects. - Maintain buffer stock to mitigate supply chain disruptions.	20%	2000
Air Disc Brake & Parts	20000	Establish alternative sourcing options to reduce dependency on single suppliers. - Implement advanced inventory management systems to optimize stock levels. - Regularly assess and update procurement strategies to adapt to market changes.	15%	3000
S-Cam Brake & Parts (HCV)	6800	Conduct regular maintenance and inspections to identify and address potential issues early. - Invest in employee training to ensure proper handling and maintenance of equipment. - Establish emergency response plans to mitigate risks of equipment failure.	10%	680
Elite Brake Pads	1000	Enhance supplier relationships to ensure consistent quality and timely delivery. - Implement quality control processes to detect and address defects early. - Maintain buffer stock to mitigate supply chain disruptions.	5%	50
Super Brake Pads	11000	Implement just-in-time inventory practices to minimize excess stock. - Enhance forecasting accuracy to optimize stock levels. - Monitor market trends and adjust procurement strategies accordingly.	12%	1320
Elite Rotor	6000	Implement regular maintenance schedules to ensure optimal performance. - Invest in high-quality materials to improve durability and reliability. - Monitor and address any issues identified during quality control processes.	8%	480
Super Rotor	2300	Enhance supplier relationships to ensure timely delivery and consistent quality. -	6%	138

		Implement stringent quality control measures to detect and address defects. - Maintain buffer stock to mitigate supply chain disruptions.		

GROUP B

Item	Risk Exposure	Mitigation Actions	Reduction Percentage	Risk Reduction
Clutch Actuation	900	- Regular maintenance to detect and address issues early. - Implement quality control measures to ensure product reliability. - Maintain buffer stock to mitigate supply chain disruptions.	10%	90
Electro Magnetic Retarder	4400	- Enhance supplier relationships for timely delivery. - Implement contingency plans for potential supply chain disruptions. - Regularly inspect and maintain equipment to prevent failures.	15%	660
DOT 3 Brake & Clutch Fluid	1800	- Implement just-in-time inventory practices to minimize excess stock. - Enhance forecasting accuracy to optimize stock levels. - Monitor market trends and adjust procurement strategies accordingly.	8%	144
DOT 4 Brake & Clutch Fluid	320	- Improve inventory management practices to minimize stockouts. - Establish alternative sourcing options to reduce dependency on single suppliers. - Regularly review and update procurement strategies.	5%	16
DOT 4+ Brake & Clutch Fluid	7200	Implement tighter inventory control measures. - Diversify suppliers to mitigate supply chain risks. - Regular maintenance and quality checks to prevent stock losses.	12%	864
DOT 3 Eco-flo	300	Conduct regular maintenance and inspections to identify and address potential issues early. - Invest in employee training to ensure proper handling and maintenance of equipment. - Establish emergency response plans to mitigate risks of equipment failure.	10%	30
EzCool (Green)	200	Enhance supplier relationships to ensure timely delivery and consistent quality. - Implement stringent quality control measures to detect and address defects. - Maintain buffer stock to mitigate supply chain disruptions.	6%	12
EzSteer (Steering Fluid)	320	Improve forecasting accuracy to minimize overstock or stockouts. - Implement just-in-time inventory practices. - Regular inspections to detect and address any issues promptly.	8%	25.6
Dura Brake Pads	1200	Enhance supplier relationships to ensure consistent quality and timely delivery. - Implement quality control processes to detect and address defects early. - Maintain buffer stock to mitigate supply chain disruptions.	7%	84
Platinum Brake Pads	4700	Implement regular maintenance schedules to ensure optimal performance. - Invest in high-quality materials to improve durability and reliability. - Monitor and address any issues identified during quality control processes.	9%	423

Item	Risk Exposure	Mitigation Actions	Reduction Percentage	Risk Reduction
Zap EV Pads	200	Implement contingency plans for potential supply chain disruptions. - Establish alternative sourcing options to reduce dependency on single suppliers. - Regularly review and update procurement strategies.	5%	10

GROUP C

Item	Risk Exposure	Mitigation Actions	Reduction Percentage	Risk Reduction
Clutch Actuation	900	Regular maintenance to detect and address issues early. - Implement quality control measures to ensure product reliability. - Maintain buffer stock to mitigate supply chain disruptions.	10%	90
Electro Magnetic Retarder	4200	Enhance supplier relationships for timely delivery. - Implement contingency plans for potential supply chain disruptions. - Regularly inspect and maintain equipment to prevent failures.	15%	630
DOT 3 Brake & Clutch Fluid	720	Implement just-in-time inventory practices to minimize excess stock. - Enhance forecasting accuracy to optimize stock levels. - Monitor market trends and adjust procurement strategies accordingly.	8%	58
DOT 4 Brake & Clutch Fluid	100	Improve inventory management practices to minimize stockouts. - Establish alternative sourcing options to reduce dependency on single suppliers. - Regularly review and update procurement strategies.	5%	5
DOT 4+ Brake & Clutch Fluid	7000	Implement tighter inventory control measures. - Diversify suppliers to mitigate supply chain risks. - Regular maintenance and quality checks to prevent stock losses.	12%	840
DOT 3 Eco-flo	200	Conduct regular maintenance and inspections to identify and address potential issues early. - Invest in employee training to ensure proper handling and maintenance of equipment. - Establish emergency response plans to mitigate risks of equipment failure.	10%	20
EzCool (Green)	100	Enhance supplier relationships to ensure timely delivery and consistent quality. - Implement stringent quality control measures to detect and address defects. - Maintain buffer stock to mitigate supply chain disruptions.	6%	6
EzSteer (Steering Fluid)	100	Improve forecasting accuracy to minimize overstock or stockouts. - Implement just-in-time inventory practices. - Regular inspections to detect and address any issues promptly.	8%	8
Dura Brake Pads	750	Enhance supplier relationships to ensure consistent quality and timely delivery. - Implement quality control processes to detect and address defects early. - Maintain buffer stock to mitigate supply chain disruptions.	7%	53
Platinum Brake Pads	4700	Implement regular maintenance schedules to ensure optimal performance. - Invest in high-quality materials to improve durability and reliability. - Monitor and address any issues identified during quality control processes.	9%	423
Zap EV Pads	190	Implement contingency plans for potential supply chain disruptions. - Establish alternative sourcing options to reduce dependency on single suppliers. - Regularly review and update procurement strategies.	5%	9

FINDINGS

1. There is no constant improvement in sales for the most product for last five years in all the three groups
2. There is less growth or in certain growth in the company for last five years
3. Less improvement in group b and c product, ther is no improvement in their growth of ther product
4. Ther is no proper marketing team ,it directly deals with huge companies,they where not concentrate middle companies
5. All products safety stock level is 10% so there is surplus of goods in the inventory
6. Ther is no proper allocation percentage for group B and C
7. Certain items like "DOT 4+ Brake & Clutch Fluid" and "Platinum Brake Pads" consistently show good risk reduction. This means the actions taken to reduce risks for these items are effective.
8. Other items like "DOT 4 Brake & Clutch Fluid" consistently have low risk reduction. This suggests that the efforts to reduce risks for these items might not be as successful.
9. t items, the risk reduction stays pretty much the same each time. This shows that the methods used to lower risks for these items are consistent and reliable

SUGGETIONS

1. Ther should be constant improvement in the sales of their product specially in their own product
2. Concentrate in the improvement of the own product
3. Keep atleast 20% of safty stock level for grop a, and 10% for group b and c
4. There is shoud be proper marketing for increasing their sales
5. For items with low risk reduction, it's crucial to rethink and strengthen mitigation plans by considering alternative methods.
6. Investigate why certain items have low risk reduction to develop more precise mitigation strategies, using thorough risk assessments
7. Implement a strong monitoring system to track how well mitigation strategies work over time, ensuring they adapt to changing risks

CONCLUSION

Our project has given us useful information about how demand and inventory are managed at Brakes India Pvt Ltd. By looking closely at the data and trying out different methods, we've made big improvements in how we handle our stock, predict what we'll need in the future, keep a safety stash of products, organize our inventory, work with suppliers, track how well we're doing, and always look for ways to do better. These changes have made us work smoother, spend less money on storing things, serve our customers better, and be ready for whatever changes come our way. Looking ahead, we need to keep doing what works, use technology wisely, work closely with our suppliers and partners, and keep finding ways to do things better.

REFFERENCES :

1. Edwin Sitienei, Florence Memba (2015-16) “The Effect of Inventory Management on Profitability of Cement Manufacturing Companies in Kenya: A Case Study of Listed Cement Manufacturing Companies in Kenya” International Journal of Management and Commerce Innovations Vol. 3, Iss. 2, pp. 111-119
2. Keah Choon Tan (2014), “A Framework Of Supply Chain Management Literature”, University of Nevada Las Vegas, College of Business,Department of Management, 4505 Maryland Parkway, Las Vegas, NV 89154-6009
3. Nyabwanga, Robert Nyamao & Ojera, Patrick. (2012). Inventory management practices and business performance for small scale enterprises in Kenya. KCA Journal of Business Management, vol.4,iss.1, pp.11–28.
4. Srinivasa Rao Kasisomayajula(2014) “An Analytical Study on Inventory Management in Commercial Vehicle Industry in India”, International Journal of Engineering Research, Vol.3, Iss.6, pp.378-383.
5. Soni, Anita. (2012). Inventory management of engineering goods industry in Punjab: An empirical analysis. International Journal of Multidisciplinary Research, vol.2,iss.2, pp.247–261.

WEBSITE

1. **https://brakesindia.com/**
2. **https://brakesindia.com/**
3. **https://www.investopedia.com/terms/d/demand**