A STUDYON MATERIAL REQUIREMENT PLANNING AND BUDGETING

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ABSTRACT

Material Requirement Planning (MRP) is a critical component in the manufacturing and production sector, aiming to ensure that materials are available for production, products are available for delivery to customers, and inventory levels are managed optimally. This study explores the integration of MRP systems with budgeting processes to enhance financial planning and control within an organization. The research focuses on the alignment of production schedules with financial forecasts, the impact of accurate MRP on cost management, and the role of technology in streamlining these processes. Through a detailed analysis of case studies and industry practices, the study highlights the benefits of synchronizing MRP and budgeting, such as improved resource allocation, reduced waste, and enhanced financial performance. The findings suggest that companies leveraging integrated MRP and budgeting systems can achieve better operational efficiency and financial stability.

Keyword: Financial planning, MRP planning, Budgeting, Inevtory management, Financial performance

INTRODUCTION

Material Requirement Planning (MRP) and budgeting are critical components of efficient production and financial management in manufacturing and other industries. MRP is a systematic approach to calculating the materials and components needed to manufacture a product, ensuring that the right quantities are available at the right time. This method involves the use of software tools to manage inventory levels, production schedules, and procurement activities, thereby minimizing waste and optimizing the use of resources. Budgeting, on the other hand, involves the allocation of financial resources to various aspects of a business's operations. It is essential for planning and controlling expenditures, forecasting future financial performance,

and ensuring that a company's strategic goals are financially feasible. Together, MRP and budgeting enable organizations to synchronize their production schedules with financial planning, ensuring that operational activities are supported by adequate funding and resource allocation. By integrating these two processes, businesses can achieve better cost control, reduce downtime, improve production efficiency, and enhance overall financial health. This integration is particularly vital in today's competitive market environment, where efficient resource utilization and cost management are crucial for maintaining a competitive edge.

NEED OF THE STUDY

The need for a study on material requirement planning (MRP) and budgeting arises from the critical importance of efficient resource management in contemporary business environments. Companies continually seek ways to optimize their operations to remain competitive and sustainable. Integrating MRP with budgeting processes offers a promising avenue for achieving this optimization. However, despite recognition of their significance, there remains a gap in understanding the synergies, challenges, and best practices associated with this integration. Therefore, a comprehensive study is warranted to explore the complexities of MRP and budgeting alignment, providing valuable insights for businesses aiming to enhance their operational effectiveness, minimize costs, and maximize profitability**.**

OBJECTIVES OF THE STUDY

• To assess the current inventory levels and identify areas for optimization in material planning and budgeting.

• To establish efficient forecasting techniques to accurately predict material requirements and minimize excess inventory.

• To develop a comprehensive budgeting framework that aligns with the organization's strategic goals and financial constraints.

• To implement cost-effective procurement strategies that ensure timely acquisition of materials while staying within budgetary limits.

• To evaluate the performance of suppliers and vendors based on quality, reliability, and cost-effectiveness to support effective budget allocation.

SCOPE OF THE STUDY

The scope of the study encompasses a comprehensive examination of material requirement planning (MRP) and its alignment with budgeting processes within diverse organizational contexts. It will explore the theoretical foundations, practical implementation strategies, and the interplay between MRP systems and budgeting frameworks. The study will investigate various industries and organizational sizes to provide a holistic understanding of MRP's impact on resource allocation, benefits, and best practices associated with integrating MRP and budgeting methodologies, aiming to offer actionable insights for optimizing operational efficiency and financial accountability

REVIEW OF LITERATURE

Annanad kumar verma , Abhishek Verma , Nitesh kumar , abhishek verma (2024), This review explores the implementation of Materials Requirement Planning (MRP) in small and medium-sized manufacturing firms, examining the process, contributing factors, and outcomes. It aims to understand how these factors interact and address a specific problem in these industries. The study highlights MRP's role in managing dependent demand items, improving inventory turnover, and minimizing costs. By identifying and addressing key issues, the review confirms the benefits of MRP and suggests that manufacturers should continuously improve aspects that enhance MRP implementation to boost overall efficiency.

Ejeh Cornelius Kelvine , Emmanuel Ogala (2024), This study proposes a cloud-based budgeting system for Nigerian universities to address challenges like limited resources and complex funding. Utilizing cloud technology, the system offers scalability, security, and efficiency, enabling stakeholder collaboration, automated data integration, real-time updates, and customizable reporting. A mixed-methods evaluation shows improved accuracy, transparency,

and user satisfaction, revolutionizing budgeting practices and promoting financial sustainability. The research provides practical insights for policymakers and university administrators to enhance budgeting in Nigerian higher education.

Marcin Walczak (2023), This article defines and evaluates the budgeting process in enterprises through a critical review of management accounting literature and empirical evidence. Key findings highlight the resource-intensive nature of budgeting, involving significant managerial and employee efforts, and suggest exploring alternative approaches. The study organizes theoretical and empirical insights to aid in planning system decisions and proposes new practical tools, contributing to discussions on financial planning systems in enterprises.

Ann Robins , Mohammed Omer(2022), This case study explores a pilot project on participatory planning and budgeting in the health sector across six districts in Ethiopia's Somali region. Utilizing the World Bank's accountability framework, community representatives were engaged, leading to the creation of health Joint Action Plans (JAPs). Nearly half of the JAP activities were integrated into the annual health budget, with implementation commencing in the first half of the fiscal year. The study underscores the feasibility of community involvement in budgeting, emphasizing the need for government support and dedicated funding in annual budgets to sustain participatory processes.

Sarwono , Failasophia Karima (2021), This research investigates the consistency between planning and budgeting in Pangkalpinang City Government from 2018 to 2020. Despite a commitment from the Regional Head to improve consistency, the analysis reveals inconsistency in the process. The research focuses on key government agencies involved in planning and budgeting, utilizing a qualitative approach. Results indicate varying levels of consistency each year, highlighting the need for improvement in aligning planning and budgeting processes.

RESEARCH METHODOLOGY

METHODOLOGY:

The project evaluates the Material Requirements Planning (MRP)it Analyzing current inventory levels, forecasting future demand, and generating purchase orders to ensure adequate materials are available for production. Budgeting it is Gathering historical financial data, forecasting future

expenses and revenues, and allocating resources efficiently to meet organizational objectives while maintaining financial stability.

TOOLS USED IN ANALYSIS

• Inventory management techniques

• Cash budgeting

PERIOD OF THE STUDY

The study covers the period of 5 YEARS

DATA ANALYSIS AND INTERPRETATION

MATERIAL REQUISITION QUANTITY (MRQ)

MRQ = (D×LT) + SS

S.NO	RAW MATERIAL	DEAMAND	LEAD TIME	SAFTEY STOCK	MATERIAL REQUISITION QUANTITY (MRQ)
1	CAPACITOR	480	5	0	2400
2	DIODE	400	4	0	1600
3	LED	500	3	0	1500
4	RESISTOR	550	5	0	2750
5	ZENER	380	5	0	1900

INFERENCE

It is inferred that when the raw material reaches 2400, 1600, 1500, 2750, 1900, to the units they should requisition .

ECONOMIC ORDER QUANTITY (EOQ)

EOQ=√2DS/2

S.NO	RAW MATERIAL	ANNUAL DEMAND	ORDERING COST	HOLDING COST PER YEAR	ECONOMIC ORDER QUANTITY
1	CAPACITOR	172800	275	7.5	1200
2	DIODE	144000	100	4	1200
3	LED	180000	150	4	1500
4	RESISTOR	198000	360	6	2400
5	ZENER	136800	250	4.5	1200

INFERENCE

It is inferred that they should order approximately 1200, 1200, 1500, 2400, 1200 units each time they place an order

CALCULATION OF JUST-IN-TIME (JIT) USING ROP (RE-ORDER POINT)

ROP = D × LT

S.NO	RAW MATERIAL	DEMAND	LEAD TIME	REORDER POINT
1	CAPACITOR	480	5	2400
2	DIODE	400	4	1600
3	LED	500	3	1500
4	RESISTOR	550	5	2750
5	ZENER	380	5	1900

INFERENCE

It is inferred that the company reorder point is 2400, 1600, 1500, 2750, 1900, 2320, 1750, 2250, 1900, 2800 units

CALCULATION OF BUDGETIONG FOR THE PERIOD OF 5 FIVEYEAR

PARTICULARS	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024
INCOME					
SALES REVENUVE	30,000,000.00	45,000,000.00	50,000,000.00	60,000,000.00	70,000,000.00
INVESTMENT					
a) FIXED DEPOSIT	500,000.00	1,000,000.00	2,000,000.00	500,000.00	2,800,000.00
b)SHARE INVESTMENT	300,000.00	200,000.00	100,000.00	-	400,000.00
TOTAL INCOME(A)	**30,800,000.00**	**46,200,000.00**	**52,100,000.00**	**60,500,000.00**	**73,200,000.00**
EXPENSES					
1)OPERATING EXP					
a)EMPLOYEE WAGES AND BENIFITS	10,800,000.00	13,200,000.00	14,400,000.00	15,600,000.00	16,800,000.00
b)RENT OR LEASE PAYMENT	1,800,000.00	1,920,000.00	2,040,000.00	2,160,000.00	2,280,000.00
c)UTLITIES	835,000.00	793,000.00	657,000.00	592,000.00	385,250.00
d)PURCHASE	9,500,000.00	18,000,000.00	20,000,000.00	22,000,000.00	32,000,000.00
e)MARKETING AND ADVERTISING	426,000.00	360,000.00	240,000.00	192,000.00	156,000.00
f)INSURANCE	336,000.00	270,000.00	210,000.00	195,000.00	142,000.00
g)MAINTENANCE AND REPAIR	663,600.00	548,000.00	467,000.00	355,000.00	234,000.00
h)STATUTORY EXP	639,000.00	534,000.00	456,000.00	350,000.00	288,000.00
i)PROFESSIONAL					

SERVICES	227,200.00	198,650.00	156,200.00	110,000.00	99,000.00
j)TRAVEL AND ENTERTAINMENT	408,000.00	344,300.00	287,500.00	240,000.00	175,000.00
k)SOFTWARE AND TECHNOLOGY	405,000.00	350,000.00	289,000.00	250,000.00	160,000.00
l)TRAINING AND DEVELOPMENT	222,000.00	397,000.00	254,000.00	198,000.00	110,000.00
m)BANK CHARGES	660,341.30	550,000.00	459,000.00	357,000.00	264,900.00
n)SHIPPING AND PACKING SUPPLIER	850,000.00	310,000.00	287,000.00	254,800.00	186,200.00
2)CAPITAL EXP					
a)EQUIPMENT	250,000.00	220,000.00	198,000.00	156,000.00	124,500.00
b)ACILITY EXP	585,000.00	327,600.00	265,900.00	220,000.00	185,000.00
c)INFRASTRUCTURE	500,000.00	950,000.00	765,000.00	500,000.00	320,000.00
d)INTANGIBLE ASSEST	185,000.00	151,000.00	117,000.00	98,000.00	85,000.00
e)RESEARCH AND DEVELOPMENT	900,000.00	1,100,000.00	1,300,000.00	1,500,000.00	1,000,000.00
f)EXPANSION AND RENOVATION	117,600.00	105,000.00	198,000.00	85,000.00	75,000.00
	30,309,741	**40,628,550.**	**43,046,600.**	**45,412,800.**	**55,069,850.**

TOTAL EXP (B)	**.30**	**00**	**00**	**00**	**00**
NET PROFIT (A-B)	**490,258.70**	**5,571,450.00**	**9,053,400.00**	**15,087,200.00**	**18,130,150.00**

INFERENCE

It is inferred that the cash budget for the period of 2019 to 2024 indicates the financial performance of the company is increasing every year and the company is in the growth stage.

FINDINGS

It is inferred that when the raw material reaches 2400, 1600, 1500, 2750, 1900, 2320, 1750, 2250, 1900, 2800 to the units they should requisition .It is inferred that they should order approximately 1200, 1200, 1500, 2400, 1200, 2400, 1000,1500, 1500, 1800 units each time they place an order. It is inferred that the company reorder point is 2400, 1600, 1500, 2750, 1900, 2320, 1750,2250, 1900, 2800 units. It is inferred that the cash budget for the period of 2019 to 2024 indicates the financial performance of the company is increasing every year and the company is in the growth stage. Effective material planning and budgeting are crucial for efficient inventory management andcost control. Proper forecasting methods improve accuracy in material requirements, reducing excess inventory and stock outs. Budgeting helps allocate resources effectively, optimizing purchasing decisions and minimizing waste. Integration of material planning with budgeting enhances coordination between departments, streamlining operations. Continuous monitoring and adjustments to the budget ensure adaptability to changing market conditions and demand fluctuations. Technology-enabled tools facilitate data analysis and decision-making, improving overallmaterial planning and budgeting processes.

SUGGESTIONS

• Implement an Integrated ERP System, just-in-time (JIT) and economic order quantity (EOQ) for material requirement planning.

• Conduct Regular Demand Forecasting.

• Maintain the safety stock.

• Predict and forecast the future using the budgeting.

• Implement the financial planning to reduce the risk using the budgeting.

CONCLUSION

Material Requirement Planning (MRP) and budgeting are critical components in manufacturing and production management, ensuring that resources are effectively allocated and costs are controlled. MRP helps in determining the quantity and timing of material purchases, aligning production schedules with demand forecasts, and minimizing inventory costs. Budgeting, on the other hand, provides a financial framework that supports strategic planning and operational efficiency. Together, they enable organizations to optimize resource utilization, reduce waste, and enhance profitability. Effective integration of MRP and budgeting processes results in improved production planning, cost management, and overall financial performance, leading to more sustainable and competitive business operations.

REFFERENCE

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