International Scientific Journal of Engineering and Management (ISJEM) ISSN: 2583-6129
Volume: 05 Issue: 04 | April – 2026 DOI:10.55041/ISJEM06909
An International Scholarly || Multidisciplinary || Open Access || Indexing in all major Database & Metadata

Cost Control and Cost Reduction Techniques

Mr. Elaiyaraja A[1] , Mr. Harish S[2]
[1]Mr. Elaiyaraja A, Assistant Professor, Panimalar Engineering College, Chennai - 600123
[2]Mr. Harish S, Student, Panimalar Engineering College, Chennai - 600123

ABSTRACT

This study explains how cost control and cost reduction methods are used by organization a company involved in plastic injection mould manufacturing. In this industry, managing costs is very important because expenses like raw materials, labour, electricity, machine maintenance, and overheads directly affect the company's profit. The main aim of the study is to understand how the company controls these costs without affecting the quality of the final product. For this purpose, both primary data (through employee interaction and observation) and secondary data (from company records, reports, books, and journals) were collected for a period of five years from 2020–2021 to 2024–2025. To analyse the data, different financial and analytical tools such as cost sheet analysis, break-even analysis, cost percentage analysis, cost–benefit analysis, return on investment (ROI), payback period, trend analysis, and cost saving analysis were used. These tools helped in understanding the cost structure and identifying areas where expenses can be reduced. The study clearly shows that material cost takes the largest portion of total cost, making it the most important area for cost control. At the same time, managing labour cost, power consumption, and overhead expenses also plays a key role in improving profitability.

Keywords: Cost control, cost reduction, plastic injection moulding, material cost, labour cost, overhead management, profitability, waste reduction, automation, productivity.

1.0 Introduction

The plastic manufacturing industry is one of the most dynamic and competitive sectors in today's industrial world. It plays a vital role in supplying materials for various industries such as packaging, automotive, construction, electronics, and healthcare. Products made through processes like injection moulding, extrusion, and thermoforming are used in everyday life, making this industry highly important. However, with growing competition and increasing operational expenses, companies in this field must focus strongly on managing their costs effectively to survive and grow.

In recent years, the industry has been facing several challenges. The prices of raw materials, which form the largest portion of production cost, have been rising steadily. At the same time, energy costs, especially electricity used to operate heavy machinery, have increased significantly. Along with this, intense competition in the market has forced companies to offer high-quality products at competitive prices. Because of these factors, it has become essential for plastic manufacturing companies to adopt proper cost control and cost reduction techniques to maintain profitability and efficiency.

Cost control refers to the process of planning, monitoring, and regulating expenses so that they stay within the planned or budgeted limits. It involves comparing actual costs with standard costs and identifying any differences. When variations occur, corrective actions are taken to bring costs back under control. In plastic manufacturing, cost control mainly focuses on key areas such as raw materials, labour, machine usage, and overhead expenses. Since raw materials account for a major share of total cost, even small savings in material usage can lead to significant overall cost reduction. Proper storage, handling, and accurate measurement of materials help in reducing wastage and avoiding unnecessary losses.

Energy consumption is another important factor that needs close monitoring. Machines used in processes like injection moulding consume a large amount of electricity. By regularly checking power usage and maintaining machines properly, companies can reduce unnecessary energy consumption and lower production costs. Labour cost also plays a crucial role in overall expenses. Improving worker productivity, reducing idle time, and providing proper training can help in controlling

labour costs without affecting output quality. Efficient workforce management ensures that work is completed on time with minimum waste of resources.

Machine maintenance is equally important in cost control. Regular and preventive maintenance helps in avoiding unexpected breakdowns, which can disrupt production and increase repair costs. Well-maintained machines operate more efficiently and produce better quality output, reducing the chances of defects and rework. This not only saves cost but also improves customer satisfaction.

While cost control focuses on managing existing costs, cost reduction aims at permanently lowering the cost of production. It involves finding better, smarter, and more efficient ways of carrying out operations without compromising on quality. In the plastic manufacturing industry, cost reduction can be achieved through process improvements, advanced technology, and better design techniques. For example, an efficient mould design can reduce cycle time, minimize material wastage, and improve product quality, leading to lower overall production costs.

Recycling and reuse of plastic waste is another important method of cost reduction. By reusing scrap materials, companies can reduce the need for fresh raw materials and also contribute to environmental sustainability. The adoption of modern machinery and automation further helps in increasing production speed, reducing human error, and improving consistency in output. Lean manufacturing practices, such as minimizing waste, improving workflow, and maintaining proper inventory levels, also play a significant role in reducing costs.

In conclusion, effective cost control and cost reduction are essential for the success of plastic manufacturing companies. By focusing on efficient use of resources, improving processes, and maintaining quality standards, companies can achieve better profitability and long-term growth in a highly competitive market.

2.0 Problem Statement and Research objectives

2.1 Problem Statement

The plastic injection mould manufacturing industry operates in a highly competitive and cost-sensitive environment, where even a small increase in production cost can directly impact a company's profitability and market position. Companies in this sector constantly face challenges due to the rising prices of raw materials, increasing labour wages, high electricity consumption, and frequent machine maintenance requirements. Among these factors, raw material cost forms the largest portion of total production cost. Any wastage, excess usage, or generation of scrap materials leads to immediate financial loss. At the same time, companies are expected to maintain strict quality standards to satisfy customer requirements, which makes managing costs even more challenging.

One of the major problems faced by the company is the lack of effective control over material usage and wastage. In many cases, improper handling, storage, or inaccurate measurement of raw materials results in unnecessary losses. Scrap generation during production and rework due to defects further increase material consumption. These issues not only raise production costs but also reduce overall efficiency. Similarly, energy consumption is another critical concern. Plastic injection moulding machines consume a large amount of electricity, and without proper monitoring, a significant amount of energy may be wasted. High energy costs directly increase the cost per unit of production, making it difficult for the company to remain competitive in pricing.

Labour cost is also an important factor contributing to the problem. Inefficient workforce management, lack of proper training, and idle time can reduce productivity and increase operational expenses. When workers are not utilized effectively, it leads to delays in production and increased cost per unit. In addition to this, machine-related issues such as frequent breakdowns, poor maintenance practices, and unplanned downtime disrupt the production process. These interruptions not only increase repair and maintenance costs but also affect delivery schedules and customer satisfaction.

Another significant issue is the lack of proper production planning and monitoring systems. Without accurate planning, machines may not be utilized efficiently, leading to underproduction or overproduction. This imbalance can result in higher inventory costs or missed deadlines. Moreover, the absence of continuous cost monitoring and analysis makes it difficult

for the management to identify areas where expenses can be reduced. Without clear data and evaluation, decision-making becomes less effective, which can negatively impact the company's performance.

In addition to cost control issues, the company also faces challenges in implementing cost reduction techniques. Problems such as material wastage, energy loss, defects, and rework add to unnecessary expenses. Without adopting modern practices like process improvement, automation, waste recycling, and preventive maintenance, the company may struggle to reduce costs in the long term. These inefficiencies not only increase production cost but also reduce overall productivity and profitability.

Therefore, the core problem lies in the need for a systematic approach to managing and reducing costs while maintaining product quality. There is a clear requirement to study the existing cost control and cost reduction practices followed by the company. By identifying key cost drivers, analyzing current methods, and evaluating performance, the company can find gaps and areas for improvement. Addressing these issues will help in improving operational efficiency, reducing unnecessary expenses, and enhancing profitability. Ultimately, solving these problems is essential for the company to achieve sustainable growth and remain competitive in the plastic manufacturing industry.

2.2Research objectives

- To study and understand the cost control methods used in the company to manage production expenses.
- To analyze the cost reduction techniques followed and identify ways to reduce wastage and improve efficiency.
- To evaluate how cost control and cost reduction practices help in increasing profit and improving overall performance.

3.0Review of Literature

1. **Salil Desai (2025)** This study explains how quality control and reliability methods help produce accurate and durable micro and nano devices. It also shows how modern techniques like AI can reduce defects and improve performance. The study highlights challenges and the need for better future research.
2. **Anil Kumar Vinayak & Mohammed Rehaan Chandan (2025)** This study shows that using waste BOP plastic in polyurethane foam helps reduce cost and supports recycling. It is useful for managing plastic waste and improving environmental benefits. However, some technical and legal challenges still exist.
3. **Bo Liu & Jian Yang (2024)** This study explains how a new lightweight tailgate for electric vehicles is designed using advanced methods. It reduces weight, improves strength, and lowers production cost. It also helps improve energy efficiency and sustainability.
4. **Enesi S Yekini & Joseph Dirisu (2024)** This study explains that Value Engineering helps reduce cost by removing unnecessary expenses in production. It improves product quality and efficiency by better use of materials and processes. It also helps companies stay competitive.
5. **Hicham Ben Youcef & Vera Trabadelo (2023)** This study presents a cost estimation tool for casting-based manufacturing. It helps calculate production cost by analyzing materials, labour, and other expenses. It supports better planning and decision-making for improving efficiency and profit.

4.0 Research Methodology

4.1 Research design

The research design of this study is mainly based on analytical and descriptive methods using secondary data. It focuses on understanding how cost control and cost reduction techniques are applied in by organization. The study uses already available data from sources such as company records, annual reports, cost sheets, financial statements, books, journals, and websites. This type of design helps in clearly describing the existing cost structure and also analyzing how different cost elements like material, labour, and overheads behave over a period of time. The research is descriptive because it explains the current practices followed by the company in managing costs, and it is analytical because it examines the collected data to identify patterns, changes, and problem areas. Various tools such as cost sheet analysis, break-even analysis, cost percentage analysis, trend analysis, and cost-saving analysis are used to interpret the data in a simple and meaningful way. These tools help in identifying major cost components, understanding cost variations, and evaluating the effectiveness of

existing cost control measures. The study also compares the company's performance over different years to find out whether costs are properly controlled and where improvements are needed. Since the research is based on secondary data, it is time-saving and cost-effective, but it requires careful selection of accurate and reliable information. Overall, the research design helps in systematically analyzing cost-related data, identifying areas of inefficiency, and suggesting practical methods to reduce cost and improve profitability and operational efficiency in the company.

4.2 Empirical validation

Empirical validation in this study means checking whether the findings about cost control and cost reduction are supported by real data and actual results. Instead of depending only on theory, the study uses company records like cost sheets, financial statements, and production data over the five-year period to test the effectiveness of different cost management

YEAR	MATERIAL COST	LABOUR COST	FACTORY OVERHEADS	ADMINISTRATIVE OVERHEADS	SELLING & DISTRIBUTION OVERHEADS	TOTAL COST
2020-2021	0.77	0.81	0.28	0.10	0.15	**2.11**
2021-2022	1.16	0.95	0.35	0.06	0.22	**2.74**
2022-2023	1.34	1.02	0.33	0.12	0.22	**3.03**
2023-2024	1.42	1.19	0.33	0.15	0.21	**3.30**
2024-2025	1.82	1.16	0.34	0.09	0.60	**4.01**

techniques. By analyzing this data through tools such as trend analysis, cost percentage analysis, and break-even analysis, the study verifies whether the company has successfully controlled costs and improved efficiency. For example, if material cost is identified as the highest expense, the data is examined to confirm how changes in material usage or waste reduction have affected total cost. Similarly, improvements in labour efficiency, machine utilization, and overhead control are evaluated using actual performance data. The comparison of costs over different years helps to validate whether cost reduction techniques like recycling, automation, and better planning have led to measurable savings. This practical verification ensures that the conclusions are reliable and based on real performance, not assumptions. Overall, empirical validation strengthens the study by proving that the suggested cost control and cost reduction methods are effective, realistic, and useful for improving profitability and operational efficiency.

5.0 Results and Discussion

5.1 COST SHEET ANALYSIS

INFERENCE: The table clearly shows that the total cost has steadily increased from 2.11 crore in 2020–2021 to 4.01 crore in 2024–2025. This rise is mainly due to the continuous increase in material cost and labour cost, which form the major share of total cost.

DISCUSSION: The total cost has increased year by year mainly because material and labour costs are rising continuously. Material cost takes the largest share, showing that raw material prices strongly affect the overall cost. To control this increase, the company should focus on reducing material wastage and improving labour productivity.

5.2 COST BENEFIT ANALYSIS.

YEAR	TOTAL BENEFITS	TOTAL COSTS	COST BENEFIT RATIO
2020-2021	0.81	3.99	**0.21**
2021-2022	0.95	2.55	**0.37**
2022-2023	1.03	3.72	**0.27**
2023-2024	1.19	3.23	**0.31**
2024-2025	1.16	3.91	**0.29**

INFERENCE : The table shows that the cost–benefit ratio improved from 0.21 in 2020–2021 to 0.37 in 2021–2022, then remained around 0.27 to 0.31 in the following years. This indicates that the company maintained a moderate level of benefits compared to the total costs.

DISCUSSION: The total cost is increasing every year mainly because material and labour costs are going up continuously. Material cost has the highest share, showing that raw material price is the biggest factor affecting overall cost.

5.3 SCRAP COST ANALYSIS.

YEAR	QUANTITY OF SCRAP	COST PER UNIT	SCRAP COST
2020-2021	4.2	3.9	**16.38**
2021-2022	2.7	2.5	**6.75**
2022-2023	4.1	3.7	**15.17**
2023-2024	3.3	3.2	**10.56**
2024-2025	4.1	3.9	**15.99**

INFERENCE : The scrap cost is highest in 2020–2021 and again increases in 2024–2025, showing higher material wastage in those years. Overall, scrap cost fluctuates, but the lower cost in 2021–2022 indicates better control over waste during that period.

DISCUSSION: The scrap cost shows ups and downs over the years, with higher values in 2020–2021 and 2024–2025 due to increased material wastage. In 2021–2022, the scrap cost is much lower, which indicates better waste control and efficient production during that time.

6.0 Implications of Future Research

The study on cost control and cost reduction techniques in plastic injection mould manufacturing are highly significant, as they can provide deeper insights and practical solutions for improving efficiency, profitability, and sustainability in the industry. As the study highlights the importance of managing costs effectively, future research can play a key role in helping organizations adopt more advanced and innovative approaches. One major implication is the integration of modern technologies such as automation, artificial intelligence, and data analytics into cost management systems. By exploring these areas, future studies can help companies understand how technology can be used to monitor production processes in real time, identify inefficiencies quickly, and make faster and more accurate decisions. This can lead to better control over expenses and reduction of unnecessary costs. Another important implication is the development of real-time cost monitoring systems, which can provide continuous updates on production costs and help management take immediate corrective actions whenever deviations occur. This would improve transparency and accountability in cost management practices. Future research can also contribute by comparing cost control techniques used by different companies within the same industry, which can help in identifying best practices and setting benchmarks for performance. Such comparative studies can guide organizations in adopting successful strategies that have been proven effective in similar environments. Additionally, research focusing on employee training and skill development can highlight the role of human resources in cost reduction. Skilled and well-trained workers can reduce errors, minimize waste, and improve productivity, which directly impacts overall cost efficiency. Another key implication is the growing importance of sustainability in cost management. Future

research can explore eco-friendly practices such as recycling plastic waste, reducing energy consumption, and optimizing material usage, which not only reduce costs but also support environmental protection and corporate social responsibility. Furthermore, studies can examine the long-term impact of cost reduction techniques on product quality and customer satisfaction, ensuring that efforts to lower costs do not negatively affect the company's reputation or market demand. Financial analysis over a longer period can also provide valuable insights into how consistent cost control measures influence profitability, stability, and growth of the organization. The role of supply chain management is another important area, where future research can analyze how efficient supplier selection, inventory management, and logistics planning can help in minimizing costs. Moreover, the application of modern costing techniques such as activity-based costing and lean manufacturing can be studied in detail, especially in small and medium-sized enterprises, to understand their effectiveness and feasibility. Finally, future research involving both primary and secondary data with larger sample sizes can improve the accuracy and reliability of findings, making them more useful for practical implementation. Overall, these implications show that future research has the potential to enhance cost management practices by combining technological advancements, human efficiency, environmental responsibility, and financial analysis, ultimately helping manufacturing companies achieve sustainable growth and long-term success.

7.0 Conclusion

the study on cost control and cost reduction techniques clearly highlights that effective cost management is not just an option but a necessity for survival and growth in the plastic injection mould manufacturing industry. This industry operates in a highly competitive environment where even a small increase in production cost can directly affect profitability, making it essential for organizations to carefully monitor and manage every element of cost. The findings of the study show that raw material cost is the most significant component of total production cost, and therefore, proper control over material usage, reduction of wastage, and efficient purchasing practices play a vital role in improving overall financial performance. Along with this, other costs such as labour, electricity, and machine maintenance also require continuous attention, as inefficient handling of these resources can lead to unnecessary expenses and reduced productivity. The study further emphasizes that adopting proper cost control techniques, such as effective production planning, close supervision of labour, regular monitoring of energy consumption, and maintaining strict quality standards, can help organizations reduce avoidable losses and improve operational efficiency. At the same time, cost reduction strategies like recycling of scrap materials, use of advanced machinery and automation, improving mould design, and implementing preventive maintenance practices offer long-term benefits by permanently lowering production costs without affecting product quality. Although the company has shown consistent growth over the years, certain fluctuations in financial indicators like return on investment, break-even point, and cost-saving performance indicate that there is still room for improvement in cost management practices. This suggests the need for more accurate cost monitoring systems, better analysis of financial data, and adoption of modern tools and technologies to support decision-making. Furthermore, improving resource utilization, reducing idle time, and increasing workforce efficiency can contribute significantly to strengthening the overall financial position of the company. It is also important to note that cost reduction should never compromise product quality, as maintaining high quality standards is essential for customer satisfaction, brand reputation, and long-term business success. Therefore, a balanced approach that focuses on both cost efficiency and quality improvement is necessary. Ultimately, cost management should be viewed as a continuous and ongoing process rather than a one-time effort, where regular evaluation, innovation, and improvement are required to stay competitive in the market. By consistently implementing effective cost control measures and exploring new ways to reduce costs, the company can enhance its profitability, improve productivity, and achieve sustainable growth, ensuring long-term success in the plastic manufacturing industry.

References

1. Kent, R. (2017) explains simple and practical ways to control production costs and reduce unnecessary expenses in plastics manufacturing to improve profit and efficiency.
2. Arora, M.N. (2010) explains simple methods like standard costing and controlling overhead expenses to manage costs effectively in a business.
3. Kazmer, D. et al. (2023) explains simple ways to reduce costs and improve efficiency in injection moulding production.
4. Ongbali, S.O. (2024) explains how value engineering helps reduce costs by cutting waste and improving product quality in manufacturing.
5. Gouveia, J.R. et al. (2022) explains simple ways like repairing and reusing moulds to reduce costs and support sustainability in manufacturing.