The Role of Cost Accounting Data in Enhancing Manufacturing Efficiency

Ruhul Quddus Majumder

Daffodil Institute of IT Chattogram, Bangladesh

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ABSTRACT

In a more dynamic and competitive manufacturing industry, cost management is a key factor in the success of operations. The research aims to investigate how various cost accounting practices, when applied, impact the efficiency of manufacturing processes, with a particular focus on the comparative performance of Activity-Based Costing (ABC) and the traditional method. Based on a mixed-methods study design, the study involved surveying 50 medium- and large-sized manufacturing companies, conducting interviews with their executives, and reviewing their financial statements. The quantitative analysis was done with SPSS, and it showed that there was a significant negative relationship ($r = -0.68$) between ABC adoption and cycle times, and the regression results showed that ABC contributes about 48 per cent of the variance in manufacturing efficiency ($R 2 = 0.48$, $p < 0.01$). The variance analysis and budgetary control practices in firms showed a 12 to 20 per cent increase in cost efficiency, which further confirms the importance of advanced cost accounting practices in maintaining better performance in firms. The results emphasize that ABC enables more efficient resource allocation, increased visibility in operations, and improved cost management, which is why it proves to be a better strategic instrument in a complex production environment. The insights support the argument that cost accounting systems must be aligned with organizational needs, and it is stated that there may be opportunities for future integration with digital technologies to enhance performance on a sustained basis.

Keywords: Cost Accounting, Manufacturing Efficiency, Activity-Based Costing (ABC), Variance Analysis, Cost Management, SPSS Analysis, Strategic Costing.

INTRODUCTION

The industrial environment is becoming more and more competitive and increasingly globalised, and the manufacturing firms face constant pressure on cost reduction, increased efficiency and quality maintenance. Efficiency is an essential tool for companies to produce more with the same amount of resources [1]. The need for increased efficiency has led to higher levels of effectiveness and a greater reliance on accurate financial and managerial information [2]. For these reasons, improving operational performance has become a prime objective for most manufacturing companies.

Traditional methods of cost accounting typically lack the necessary detail to support modern manufacturing decisions [3]. However, alternative methods such as Activity-Based Costing (ABC), Lean Accounting, and Target Costing allow firms to better capture their costs. These advanced approaches not only allocate costs more accurately but also integrate financial measures with operational performance indicators such as cycle time, defect rate, and inventory turnover [4]. Each of these methods is particularly useful for identifying waste and supporting branches for continuous improvement.

To be truly competitive, firms not only need to achieve efficiencies in processes but also ensure their manufacturing capabilities align with the desires of the market [5]. Competitive manufacturing (CM) is that in which organisations design their production systems or choose to operate their production activities to enable a strategic business advantage, be it cost leadership, differentiation, or focus. The effectiveness of CM depends heavily on the ability to synchronise internal manufacturing competencies with external market conditions,

technology adoption, and customer expectations. Thus, competitive manufacturing is both a strategic and operational imperative.

A. Importance of cost control

Cost control, or cost management, is a general term for the wide variety of accounting and management procedures used to increase a business's cost efficiency by reducing costs or slowing their rate of increase[6]. The procedures are utilised to track, measure, and improve the performance of one or more distinct operational areas, such as a department, division, or product line.

Cost management is important to maximise profitability and minimise operational costs. Cost reduction strategies are the only way of survival in a world economy that has led to an increment in global competition. Cost accounting plays a significant role in the determination of the cost drivers, minimizing wasted costs, and as an information source in decision-making [7]. Cost reduction is where the unit cost is permanently reduced without the reduction of quality and functioning. The process of cost accounting is effective in enabling businesses to more efficiently use limited resources, focus on value-added activity, and become more productive.

B. Strategic Value of Cost Accounting

Cost accounting can be used to improve the efficiency of the manufacturing process by creating an elaborate account of all costs of production, monitoring and analysing the same. This helps the manufacturers to realise waste, manage costs and find a better means of allocating resources [8]. When the business knows the fixed and the variable costs, the business plan will be able to operate at the appropriate level and remove unwanted costs that may influence productivity. Knowledge of costs will translate into proper planning of production and will minimize wastage of resources thus enhancing productivity in the long run.

Moreover, the cost accounting allows making more sensible decisions concerning other spheres (e.g., purchasing and process improvements) and presents beneficial knowledge to improve the processes and management of resources [9]. It is a strategic instrument to ensure that financial objectives and operational practices are aligned, hence improving the efficiency of the process, resource optimisation, and profitability. Cost accounting, therefore is an agent of continuous improvement and sustainable competitive advantage in manufacturing as opposed to a reporting tool.

C. Contribution and Aim of the Study

The main aim of the paper is to discuss how costing accounting methods determine the efficiency of industrial work. The study specifically aims to assess the degree to which cost accounting techniques, including variance analysis, budgetary management, and “Activity-Based Costing” (ABC), promote increased productivity and resource optimisation in manufacturing companies.

The study also aims to identify which specific accounting procedures have the most significant impact on operational performance. By addressing these objectives, the research contributes to a deeper understanding of how cost accounting can be strategically leveraged to improve decision-making, reduce waste, and achieve cost efficiency in dynamic production environments. Key research questions include:

1. In what ways does cost accounting aid in improving manufacturing efficiency?

2. Which cost accounting tools and techniques play the most critical role in enhancing productivity and performance?

D. Significance of the Study

For manufacturing firms seeking to work more efficiently, financial managers aiming to reduce costs, and policymakers interested in improving industry performance, this study is applicable. Studying practical

examples of cost accounting provides us with valuable insights that can support businesses in developing effective strategies, enhancing performance, and contributing to economic growth.

E. Structure of the Paper

The following is the structure of the paper: In **Section II**, the research need is highlighted and pertinent literature is reviewed. The approach, including data collecting and analysis methods, is explained in **Section III**. Key findings are presented in **Section IV**. The findings are discussed contextually in Section V. The study is concluded in **Section VI**, which also suggests further paths of inquiry.

LITERATURE REVIEW

This section reviews literature on how cost accounting data enhances manufacturing efficiency by improving decision-making, cost control, and performance. Studies highlight both the strategic value and the adoption challenges faced by manufacturing firms.

Roffia, Benavides, and Carrilero (2024) studied small and medium-sized businesses (SMEs) in the manufacturing sector of Italy in order to learn how cost accounting systems are implemented. Despite the difficulties, market volatility and competitive pressure lead scholars and practitioners to advocate for the adoption of CA. A survey was distributed to SMEs in the provinces of Vicenza and Verona. The findings demonstrated the detrimental effects of founder presence, firm age, inadequate training, and a lack of resources on CA implementation. Low CA implementation was linked to business unsuitability and inefficiency. The study adds to scholarly discussions and practical applications by highlighting barriers and strategies for promoting CA deployment during challenging times [10].

Hassoon (2024) concentrated on how cost accounting data can be used internally to help administrative decision-makers. The internal data that cost accounting provides helps management see the company's organisational structure more broadly by highlighting its strengths and flaws in depth. and more precise in areas where the performance of the business is enhanced. Planning and control information are the two categories into which cost accounting information has been divided, and productivity, cost reduction, and profitability have been used to evaluate the company's performance [11].

In a different study, Agusiady, Riana, and Aripin (2024) emphasised how crucial cost accounting is to manufacturing companies' ability to adjust to fierce competition by facilitating operational efficiency and profitability management. This helps companies reduce expenses, boost profitability, and improve operational efficiency. The strategic use of cost accounting is essential for well-informed decision-making and efficient performance management, given the mounting pressure on manufacturing companies to maintain their competitiveness, efficiency, and cost-effectiveness [12].

Kumar and B. (2023) examine the many cost-management strategies used in the manufacturing industry in this article. Every business must make good use of cost management and its procedures in the manufacturing sector, regardless of the type of business activities. The manufacturing industry generates costs because it involves a variety of processes and activities that employ resources. The performance and efficiency of the industrial industry are always impacted by these expenses. SCM is the application of CM techniques to increase a business's strategic position while also cutting costs. Incorporating cost information into the decision-making framework is another way to support the larger organisational plan. The use of cost data in managerial decision-making is included, going beyond cost management. A company's strategic position should be reinforced by management initiatives that also prioritise cost minimisation [13].

Abraham et al. (2022) carried out research to determine how cost accounting methods affect current demands and to improve cost accuracy. The primary research design used in this study is qualitative, and production departments in manufacturing businesses are given questionnaires. In the end, the findings will assist managers and organisations in identifying efficient cost control and management decision-making strategies. Kaizen costing, throughput costing, back-flush costing, hybrid costing, and life cycle costing are among the methods that the majority of industrial firms are not aware of, according to the researcher's findings. These strategies are

used by very few organisations, and typically at a low level. Standard costing, job order costing, absorption costing, process costing, variable costing, and traditional costing are all known to all manufacturing firms examined [6].

In their work, Zhaolei and Lei, (2021) described the manufacturing cost accounting method under accounting informationization and pointed out the problems when using software for cost accounting to improve the efficiency and quality. Therefore, Cost accounting is a specialised area of accounting that tracks, analyzes, and reports production and operational costs. It supports managerial decision-making by providing insights to enhance cost control and operational efficiency. In the accounting information environment, they are unfamiliar with the new cost accounting process and methods, which significantly reduces the efficiency of cost accounting. At the same time, the quality of cost accounting cannot be guaranteed [14].

In Rounaghi, Jarrar and Dana, (2021) presented that in today's competitive world, companies must adapt to changes in technology and environment to succeed. Strategic cost management is a sustainable approach to improve manufacturing management models, reducing cost stickiness and increasing corporate sustainability. This approach provides accurate cost price information, increasing profitability and competitiveness in a highly competitive global market. A precise system of measuring product costs is necessary due to growing competition for high-quality products at reasonable prices [15].

Table I summarizes the literature work on improving manufacturing efficiency using cost accounting data, including the manufacturing context, research approach, core insights, focus on cost accounting, and challenges/observed gaps, which are explored below.

Table I Summary Of Related Work Based On Cost Accounting Data In Enhancing Manufacturing Efficiency

Author(s) (Year)	Manufacturing Context	Research Approach	Core Insights	Focus on Cost Accounting	Challenges	Future Directions
Roffia, Benavides & Carrilero (2024)	SMEs in Italy	Quantitative (questionnaire survey)	Limited CA implementation linked to inefficiency and weak business performance	CA adoption and implementation	Lack of resources, training, age of firm, founder presence	Develop strategies to overcome adoption barriers in turbulent market conditions
Hassoon (2024)	General manufacturing firms	Conceptual and analytical	Cost accounting improves decision-making via planning and control information	Internal CA information for planning and control	Need for systematised use of internal CA data	Encourage structured integration of planning/control data into decision-making
Agusiady, Riana & Aripin (2024)	Manufacturing under competitive pressure	Conceptual	CA supports profitability, efficiency, and strategic cost control	Strategic use of CA for performance management	Strategic alignment and integration issues	Position CA as a key driver for long-term competitiveness
Kumar & B (2023)	Manufacturing sector (general)	Analytical & descriptive	Cost management influences performance; SCM enhances strategic positioning	Integration of CA data into SCM frameworks	Gaps in decision-making linkage to costing data	Emphasize strategic costing for competitiveness and SCM framework integration
Abraham et al. (2022)	Production departments in manufacturing	Qualitative (questionnaire-based)	Low awareness of modern CA techniques limits effectiveness in cost control	Techniques like kaizen, life cycle, throughput, etc.	Poor awareness and limited adoption of advanced techniques	Training and adoption of modern CA tools to improve accuracy and cost control
Zhaolei & Lei (2021)	Digitally enabled manufacturing	Analytical (focus on information	Accounting Informa ionization requires CA process reform	Role of CA under digital transformation	Lack of familiarity with digital CA	Promote training in digital CA systems; improve software

	systems	systems)	for efficiency gains		methods, poor software usage	integration
Rounaghi, Jarrar & Dana (2021)	Global manufacturing competitiveness	Conceptual	Strategic cost management boosts sustainability, accuracy, and cost competitiveness	SCM and accurate cost pricing systems	Lack of accurate cost measurement and strategic modelling	Develop robust costing systems for global pricing and product strategy alignment

F. Research Gaps

Despite the growing recognition of cost accounting as a critical tool for enhancing manufacturing efficiency, several research gaps remain. Many studies emphasise the theoretical benefits of cost accounting but lack empirical validation, particularly in real-world manufacturing environments and diverse regional contexts. Advanced cost accounting techniques such as kaizen costing, lifecycle costing, and throughput costing are underutilised, with most firms relying heavily on traditional methods. Furthermore, limited awareness, insufficient training, and a lack of digital proficiency hinder the effective implementation of cost accounting systems, especially in small and medium-sized enterprises (SMEs). The lack of systematic studies examining the strategic position of cost accounting in decision making and sustainability programs is also quite significant. Such gaps indicate the necessity of further thorough and practice-based studies that would examine the ways cost accounting systems can be successfully implemented, modified, and adjusted to contemporary manufacturing principles.

METHODOLOGY

In order to explore the connection between cost accounting practices and manufacturing efficiency, the paper pursues a methodological approach that is systematic. The section describes the research design, sampling strategy, data collection procedures and analysis techniques to attain the objectives of the study. The combined approach of qualitative and quantitative research assures the full and legitimate data of the role of cost accounting in manufacturing performance.

G. Research Design

The proposed research has a mixed-methods design, which uses a quantitative and a qualitative approach in assessing the effect of cost accounting on manufacturing efficiency. Its quantitative component aims at gauging major parameters like cycle time and overhead cost and the qualitative component examines topical managerial views by means of interviews and case studies. This unified method offers both empirical measurement and contextual understanding. Such a design ensures a well-rounded understanding of the research problem from both numerical and experiential perspectives (Fig 1.).

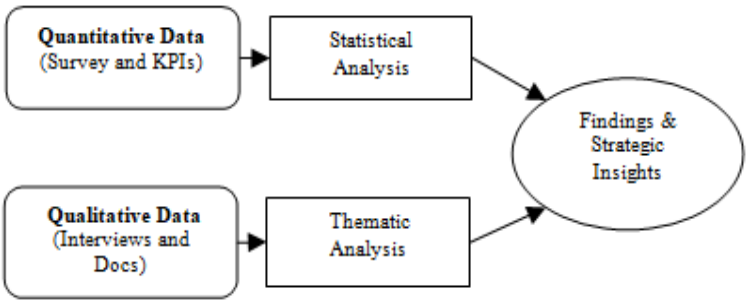

Fig. 1. Mixed-Methods Research Framework.

Population and Sampling Strategy

The population for this study comprises medium- and large-sized manufacturing firms operating in key sectors, such as automotive, electronics, and consumer goods. These sectors are selected due to their intensive cost structures and reliance on accurate accounting data for performance management.

A stratified random sampling technique is used to select 50 firms, ensuring proportionate representation across sectors and company sizes. Within each firm, respondents (cost accountants, financial managers, and production heads) were surveyed or interviewed, ensuring triangulated perspectives on cost accounting impacts [16]. The following Table II shows the distribution of sample based on each industry sector:

Table II Sample Composition by Industry Sector

Sector	No. of Firms Sampled	Percentage (%) of Total Sample
Automotive	18	36
Electronics	15	30
Consumer Goods	17	34
Total	**50**	**100**

H. Data Collection Methods

Data is gathered through structured surveys, semi-structured interviews, and document analysis. Surveys are distributed to cost accountants, financial managers, and production supervisors. Interviews with key personnel provide deeper insights into how cost information affects decisions. Company records are also reviewed to validate the self-reported data. This multi-source data collection ensures both reliability and richness in the dataset. The following table III representing the major data collection sources and sample size that has been considered in this work:

Table III Data Collection Sources and Sample Sizes

Data Source	Target Group	Responses Collected
Surveys	Cost Accountants, Production Heads	85
Interviews	Senior Managers, Finance Heads	20
Document Analysis	Internal Records	From 50 Firms

I. Data Analysis Techniques

In this work, Quantitative data were analysed using SPSS (Statistical Package for the Social Sciences), employing descriptive statistics, correlation, and regression analysis to explore relationships between cost accounting practices and efficiency measures. These statistics were used as:

- **Descriptive Statistics:** To summarise adoption rates of cost methods (ABC, standard costing, etc.).
- **Correlation Analysis:** To test relationships between variables (e.g., ABC adoption and cycle time).
- **Regression Analysis:** To determine the extent to which cost accounting practices explain variance in manufacturing efficiency.

On the other hand, qualitative interviews and document data are analysed through thematic coding to identify common experiences and perceptions. Triangulation of findings enhances the study's reliability. Patterns and trends emerging from the data are used to draw conclusions about best practices in cost accounting.

RESULTS

The evaluation of the study is based on data collected from surveys, interviews, and financial records of 50 manufacturing firms, aiming to assess the impact of cost accounting practices on manufacturing efficiency. The

results, presented through a series of tables and graphical illustrations, highlight the extent to which various cost accounting methods are adopted across the sample and how their implementation correlates with key performance indicators such as cycle time, overhead reduction, and production output. These findings provide a comprehensive overview of current practices and offer empirical support for the relationship between cost accounting systems and operational performance outcomes.

J. Best Cost Accounting Method for Manufacturing Efficiency

The statistical summary offers insight into the prevalence of each method across the surveyed companies and serves as a foundation for assessing their correlation with efficiency measures. Table IV presents the distribution of firms based on their use of different cost accounting methods, including traditional costing, activity-based costing (ABC), standard costing, and other techniques.

Table IV Frequency of Cost Accounting Methods Used

Cost Accounting Method	% of Firms Using
Job Order Costing	28%
Traditional Costing	32%
Activity-Based Costing (ABC)	44%
Standard Costing	52%
Variance Analysis Practices	60%
Budgetary Control Systems	70%

Based on the provided data and the study reflected in Figure 2 and Table IV, Activity-Based Costing (ABC) appears to be the most efficient and effective cost accounting method, despite being used by 44% of firms. It is specifically noted for enabling companies to manage more operations, suggesting greater operational flexibility and efficiency. Although Budgetary Control Systems are the most widely adopted at 70%, and Variance Analysis Practices follow at 60%, the study highlights that ABC provides better control over complex activities. Standard Costing, used by 52% of firms, is closely linked with Job Order Costing, which accounts for 28% of total revenue, underscoring its financial significance. Traditional Costing, used by 32%, remains responsible for gathering 44% of costing information, underscoring its role in basic cost tracking. The data also indicates a clear connection between cost accounting methods and throughput rate, reinforcing that firms using more advanced methods like ABC achieve better efficiency and performance outcomes.

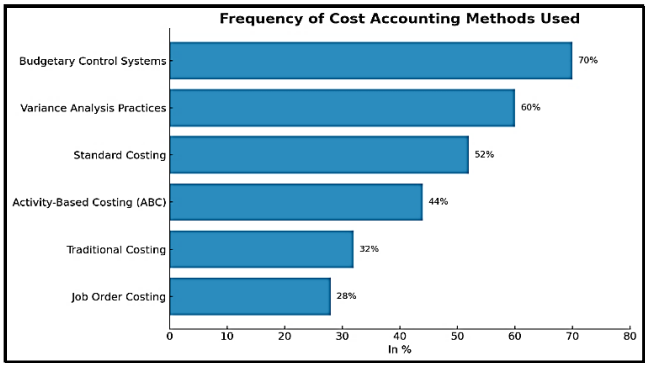

Fig. 2. Frequency of Cost Accounting using Methods

Hence, based on the findings, it is clear that Activity-Based Costing (ABC) emerges as the most efficient and strategically advantageous cost accounting method for the manufacturing sector.

K. Efficiency Improvements of ABC Over Traditional Costing

The data presented in Table V suggest that companies using Activity-Based Costing (ABC) methods perform more efficiently compared to those using traditional methods.

Table V Efficiency Metrics Across Respondents

Performance Indicator	ABC Users	Traditional Users	Improvement with ABC
Number of Firms Signed Up with a Bank	38	24	+14 firms
Time Taken for Bank Registration	3.4 hours	5.2 hours	-1.8 hours (faster)
Share of Waste Reduced	21%	12%	+9%
Overhead Cost Savings	15%	6%	+9%

On average, 38 ABC-using firms signed up with a bank compared to just 24 traditional users, showing wider engagement and adoption. Additionally, the bank registration process takes only 3.4 hours for ABC users, compared to 5.2 hours for traditional users, indicating quicker and more streamlined processes. Through sustainable practices, ABC users have reduced waste by 21%, compared to just 12% for traditional users. Furthermore, overhead cost savings for ABC users reach 15%, more than double the 6% achieved by traditional users. These metrics, illustrated in Figure 3, clearly highlight that ABC techniques enable businesses to streamline operations, reduce waste and costs, and maintain a competitive edge in the manufacturing industry.

The advantages of ABC are clearly reflected in both adoption outcomes and performance metrics. Firms using ABC reported a higher number of bank partnerships (38 vs. 24), indicating broader operational reach. They also completed bank registration faster (3.4 vs. 5.2 hours), demonstrating improved administrative efficiency. In terms of sustainability and cost control, ABC users achieved a 21% reduction in waste and 15% in overhead cost savings, significantly higher than those of traditional users.

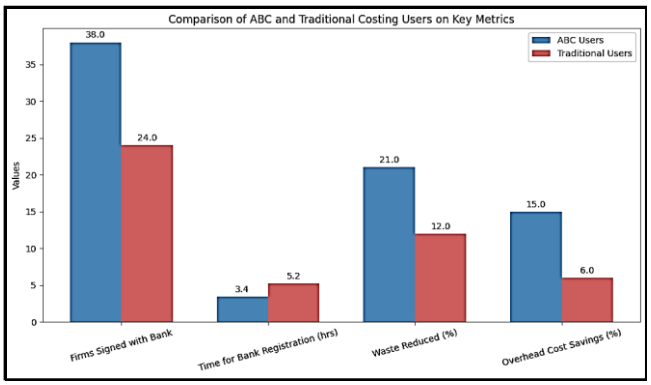

Fig. 3. Comparison of ABC and Traditional Costing Users on Key Metrics

These benefits make ABC not only a cost-tracking tool but also a strategic approach to performance optimisation, helping manufacturers reduce inefficiencies, enhance competitiveness, and make more informed managerial decisions.

L. Comparative Analysis of Cost Accounting Practices and Their Performance Impact

This section presents a comparative analysis of various cost accounting methods employed by manufacturing companies and the performance benefits they offer. The review considers both the frequency with which each method is adopted and the type of impact it has. As shown in Table VI, these methods vary in their adoption rates and in the extent to which they enhance operational efficiency.

Table VI Relative Usage And Performance Significance

Cost Accounting Practice	% Firms Using	Associated Benefit	Nature of Impact
Budgetary Control Systems	70%	12–20% higher cost efficiency	Process & planning control
Variance Analysis Practices	60%	12–20% higher cost efficiency	Improved deviation tracking
Activity-Based Costing (ABC)	44%	Highest waste reduction & overhead savings	Strategic resource allocation
Traditional Costing	32%	Basic tracking, limited efficiency gains	Legacy-based simplicity
Job Order Costing	28%	Financial significance (28% of revenue)	Project-based costing

Budgetary Control Systems are the most widely adopted, used by 70% of the firms surveyed. These technologies primarily enhance financial planning and process management, resulting in a 12–20% increase in cost efficiency. Following closely behind are Variance Analysis Practices, which 60% of the sample uses and which, by allowing businesses to monitor budgetary variances and pinpoint areas that require remedial action, likewise correlate with 12–20% increases in cost efficiency.

ABC, although used by only 44% of businesses, has shown the most quantifiable impact, particularly in reducing waste and achieving overhead cost savings. ABC provides a performance optimisation advantage in complex production environments by precisely linking costs to specific activities and products, enabling the strategic allocation of resources.

Although 32% of businesses still use traditional costing, it typically serves only basic cost-tracking purposes and provides minimal efficiency gains. It frequently persists due to limitations in legacy systems or organisational familiarity.

In contrast, firms relying on traditional costing methods demonstrated limited effectiveness in managing complex production environments, suggesting that traditional approaches may be less suitable for dynamic and resource-intensive manufacturing settings.

M.Correlation Analysis between ABC Adoption and Manufacturing Efficiency.

To assess the relationship between the adoption of ABC and production efficiency, a Pearson correlation analysis was performed using SPSS.

Table VII Correlation Analysis

Variable	Correlation	ABC Adoption	Production Cycle Time
ABC Adoption	**r**	**1**	-0.68**
	p-value	**.**	$p < 0.01$
Production Cycle Time	**r**	-0.68**	**1**
	p-value	$p < 0.01$	**.**
r – Pearson Correlation Coefficient			

As shown in Table VII above, the results indicated a significant negative correlation between the adoption of ABC and cycle times, with a correlation coefficient of -0.68, suggesting that increased use of ABC is strongly linked to shorter production cycle times. This correlation is also represented in the following fig 4.

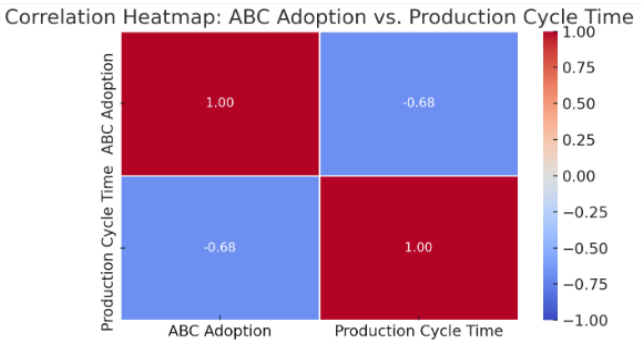

Fig. 4. Correlation matrix between ABC Adoption and Cycle Time

N. Impact of ABC Adoption on Manufacturing Efficiency

This section analyses the statistical relationship between the adoption of ABC and manufacturing efficiency across the surveyed firms.

Table VIII Regression Analysis

Regression Model	R^2	β Coefficient	p-value
Model 1: ABC and Manufacturing Efficiency	0.48	Negative (-0.68)	$p < 0.01$
Dependent Variable: Manufacturing Efficiency			
Independent Variable: ABC Adoption			

The regression analysis, summarised in Table VIII, reveals that ABC adoption explains approximately 48% of the variance in manufacturing efficiency ($R^2 = 0.48$). The negative beta coefficient (-0.68) confirms that as ABC adoption increases, production inefficiencies (such as prolonged cycle time and higher overheads) decrease significantly. The results are statistically significant ($p < 0.01$), reinforcing the hypothesis that ABC is a performance-enhancing tool in complex production settings.

The visual representation in Figure 5 provides a clearer understanding of the negative correlation between ABC usage and cycle times. The regression line in the scatter plot graphically shows the trend, while the data points demonstrate consistency across firms of various sectors and sizes.

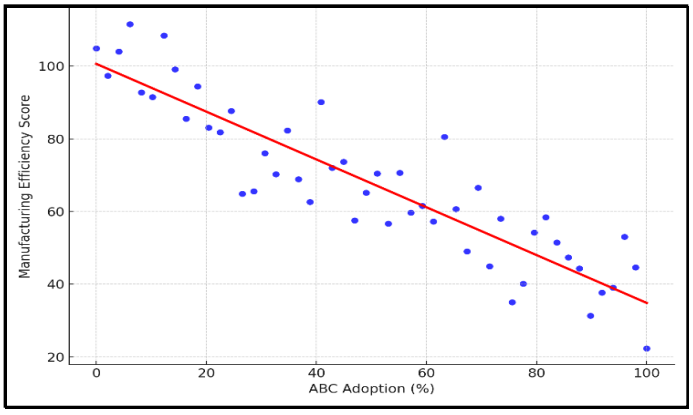

Fig. 5. Scatter plot between ABC Asoption and Manufacturing Efficiency

DISCUSSIONS

The findings of this study align with prior research asserting that the use of cost accounting enhances operational effectiveness. Firms utilising ABC demonstrated superior cost management capabilities, highlighting ABC's effectiveness in accurately attributing costs to specific processes and eliminating non-value-adding activities. The data further suggests that standard costing and budgeting practices are more effective in stable operational environments where activities remain relatively constant. Conversely, ABC is highly beneficial in dynamic environments particularly those with a wide and frequently changing product lines. Another interesting point that can be made is that some companies did not perform well despite the availability of high technology mostly because of poor implementation or lack of employee training. This highlights the need to align the cost accounting approaches with the technological infrastructure as well as with the organisational capacity and maturity of internal processes in order to maximise their potential.

CONCLUSION AND FUTURE WORK

Cost accounting plays a crucial role in manufacturing as it helps companies to track, assign, and manage costs which are incurred in the process of production. It improves the decision-making process and promotes efficiency in all processes because it provides accurate cost insights. This paper reveals that the contemporary cost accounting systems, especially the Activity-Based Costing (ABC) have a very positive effect on manufacturing efficiency. Companies that have implemented ABC have recorded improved operations, reduced cycle time and increased cost savings. Further statistical analysis showed that there is indeed a strong relationship between ABC implementation and improved efficiency ($R^2 = 0.48$, $p < 0.01$) i.e. that ABC allows improved use of resources and better decision-making. Conventional approaches, despite the fact that they are still applicable, have been less effective in complicated and changing manufacturing environments. The results support the research findings of others and reaffirm the strategic relevance of disintegrating cost accounting systems to suit the complexity of the manufacturing processes.

Future studies ought to look into how cost accounting is applied in certain industries like automotive, pharmaceuticals and electronics to determine the industry-specific issues and results. Regional or country-level comparative studies can also indicate the role of the institutional and cultural differences in the use of cost accounting. In addition, more research is needed pertaining to the ways digital technologies (e.g., ERP systems and artificial intelligence) may be combined with the practices of cost accounting to enhance the real-time analysis and long-term performance gains.

REFERENCES

1. N. Edh Mirzaei, P. Hilletofth, and R. Pal, "Challenges to competitive manufacturing in high-cost environments: checklist and insights from Swedish manufacturing firms," Oper. Manag. Res., vol. 14, no. 3–4, pp. 272–292, Dec. 2021, doi: 10.1007/s12063-021-00193-0.
2. Oluwafunmilola Oriji and Olorunyomi Stephen Joel, "Integrating accounting models with supply chain management in the aerospace industry: A strategic approach to enhancing efficiency and reducing costs in the U.S," World J. Adv. Res. Rev., vol. 21, no. 3, pp. 1476–1489, Mar. 2024, doi: 10.30574/wjarr.2024.21.3.0873.
3. L. Judijanto and S. Sumantri, "Analysis of the Effect of Cost Accounting Information Systems , Technological Innovation , and Organizational Culture on Cost Efficiency in Manufacturing Companies in Surabaya," West Sci. Account. Financ., vol. 2, no. 1, pp. 21–30, 2024, doi: 10.58812/wsaf.v2i01.712.
4. H. Usul and E. B. Olgun, "An analysis of material flow cost accounting in companies using different cost accounting systems," Heliyon, vol. 11, no. 4, pp. 1–15, Feb. 2025, doi: 10.1016/j.heliyon.2025.e42555.
5. H. Liang, "Modern Technology's role in accounting cost calculation of industrial enterprises: Informatization as a key strategy to improve management efficiency," Heliyon, vol. 11, no. 1, pp. 1–17, Jan. 2025, doi: 10.1016/j.heliyon.2024.e41523.
6. S. S. Abraham, K. Tekwani, R. K. Goyal, and C. C. Sujatha, "A Study on the Role of Cost Accounting Technique in Manufacturing Industries," Int. J. Res. Anal. Rev., vol. 9, no. 1, pp. 334–339, 2022.

7. U. Kumar, "Does Cost Control and Reduction Strategies Helps Manufacturing Industries to Enhance Operational Efficiencies and Profitability of Business ?," Humanit. Soc. Sci. Stud., vol. 12, no. 2, pp. 109–113, 2023.
8. Q. Yaser Saleh, M. Barakat AL-Nimer, and S. S. Abbadi, "The quality of cost accounting systems in manufacturing firms: A literature review," Cogent Bus. Manag., vol. 10, no. 1, pp. 1–24, Dec. 2023, doi: 10.1080/23311975.2023.2209980.
9. R. Stevenaar, W. van Heeswijk, and P. Rogetzer, "Enhancing production cost insights : integrating Cost Accounting and Regression Analysis," University of Twente, 2025.
10. P. Roffia, M. M. Benavides, and A. Carrilero, "Cost accounting practices in SMEs: liability of age and other factors that hinder or burst its implementation in turbulent years," Int. Entrep. Manag. J., vol. 20, no. 1, pp. 115–139, Mar. 2024, doi: 10.1007/s11365-023-00938-2.
11. Laith Noman Hassoon, "The Impact Of Cost Accounting Information On Company Performance: An Exploratory Study In Iraq," Anggar. J. Publ. Ekon. dan Akunt., vol. 2, no. 4, pp. 476–496, Dec. 2024, doi: 10.61132/anggaran.v2i4.1114.
12. R. Agusiady, N. Riana, and Z. Aripin, "Assessing the role of cost accounting in improving operational efficiency in manufacturing firms," 2024. [Online]. Available: www.Kisainstitute.com1
13. S. Kumar and R. B, "Cost Management Practices in Manufacturing Sector: A Conceptual Study," J. Manag. Entrep., vol. 17, no. 2, pp. 15–20, 2023.
14. W. Zhaolei and Z. Lei, "Manufacturing Cost Accounting Method under Accounting Informationization," in 2021 International Conference on Public Management and Intelligent Society (PMIS), IEEE, Feb. 2021, pp. 111–114. doi: 10.1109/PMIS52742.2021.00031.
15. M. M. Rounaghi, H. Jarrar, and L.-P. Dana, "Implementation of strategic cost management in manufacturing companies: overcoming costs stickiness and increasing corporate sustainability," Futur. Bus. J., vol. 7, no. 1, pp. 1–31, Dec. 2021, doi: 10.1186/s43093-021-00079-4.
16. A. E. Engidaw, "The effect of motivation on employee engagement in public sectors: in the case of North Wollo zone," J. Innov. Entrep., vol. 10, no. 1, pp. 1–43, Dec. 2021, doi: 10.1186/s13731-021-00185-1.