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REVIEW ARTICLE-GREEN STRATEGIC COST MANAGEMENT TECHNIQUES IN THE MODERN MANUFACTURING LANDSCAPE

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Abstract:

This article seeks to highlight and review modern technologies, including strategic costing tools. It discusses and reviews some studies and research related to these technologies, which contribute to the production of high-quality products at a low cost. It also discusses how to classify these technologies and divide them into technologies that focus on inventory, such as just-in-time production; technologies that focus on budgeting, such as activity-based costing; technologies that focus on product design stages, such as target costing; and technologies that focus on improving the economic unit, such as benchmarking, by comparing the performance of the economic unit with leading units in its field. It adopts and demonstrates the most important scientific and cognitive foundations of these technologies. The importance of this article is highlighted by the role these technologies play in the transition towards sustainability, zero inventory, and green production. Therefore, companies and institutions must make the most of strategic costing tools to rationalize investment decisions in the modern manufacturing environment by adopting comprehensive and flexible evaluation methods that take into account market fluctuations, changes, and uncertainties, with the aim of achieving a competitive advantage and achieving sustainable profits in the long term.

Keywords: Green Strategic Cost Management Techniques, Just-In-Time, Benchmarking technique. Modern Manufacturing Landscape.

Abstract:

Keywords:

INTRODUCTION: Recent advancements in managerial accounting practices and information technology, along with growing investor demands for accurate and transparent data, have led many businesses to focus on strengthening their competitive edge, maximizing profitability, and improving disclosure. Modern industrial developments have brought significant changes to the manufacturing sector, particularly in terms of environmental impact. To survive and grow in this evolving landscape, companies must adapt accordingly. Traditional costing methods have proven inadequate in reflecting these changes and are increasingly criticized for their lack of relevance to today's dynamic business environment. Consequently, there's a growing need to implement modern accounting methods—especially green target costing—as part of strategic cost management. This technique supports the creation of eco-friendly products that align with customer expectations in both cost and technical performance, all without compromising quality. For green target costing to be effective, companies must gather relevant data about each stage of the production process, including material usage, labor, overhead costs, and activity durations. This information is essential for building a competitive advantage. With rising environmental awareness and a growing preference for sustainable products, the focus has shifted towards adapting accounting tools to better align with green initiatives. Traditional target costing has evolved into a "green" model that helps organizations reduce the cost of eco-friendly products. This approach considers four key areas: conserving energy, minimizing resource consumption, preventing pollution, and utilizing renewable energy sources—all while maintaining product quality and customer satisfaction. The ultimate goal is to boost competitiveness in an environmentally responsible manner.

Research Significance: The significance of this research lies in its focus on promoting sustainability in both business operations and manufacturing processes. Green cost management techniques help companies lower overall and product-specific costs. In the context of modern manufacturing, adopting such methods is

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crucial for achieving competitive advantage, fostering environmental and social responsibility, enhancing corporate reputation, and increasing satisfaction among customers and investors alike.

Research Objectives: The research objectives are to clarify the benefits and necessity of using green strategic costing in a modern manufacturing environment by achieving the following:
*. Clarifying and presenting the scientific and cognitive foundations of strategic cost management techniques and identifying their types.
*. Improving efficiency: Improving the efficiency of production processes by reducing waste and emissions to achieve the desired cost, while ensuring quality.
*. Achieving a competitive advantage: By offering high-quality products at reasonable prices.
*. Promoting Sustainability: Social, Environmental, and Economic
Theoretical Concepts: The Concept and Importance of Strategic Cost Management Techniques

Understanding Strategic Cost Management Techniques

Strategic cost management involves monitoring and managing costs across all stages of a product's life cycle with the aim of minimizing expenses. It also encompasses analyzing both the internal and external environments of a business by designing products with features and specifications that align with consumer needs and perceived value. The overarching objective is to strengthen the company's strategic market position and build a long-term competitive edge by leveraging technical tools to manage and control costs (Mahmoud, 2010:15).
With increasing global focus on environmental sustainability, particularly as more industries shift toward eco-conscious operations, the concept of green products has emerged. These products are designed to minimize environmental harm throughout their entire life cycle. They are typically made from renewable or recyclable materials and do not emit harmful substances. Green products are resource-efficient and pose less risk to the environment, as they are built using materials that reduce negative environmental effects.

Categories of Strategic Cost Management Techniques:

First: Techniques focused on minimizing inventory levels and enhancing quality these techniques aim to boost market share and improve operational systems and procedures, supported by appropriate accounting practices.
These techniques are divided into:
* Just-In-Time Technique
* Total Quality Management
* Bounce flash technology

Second: Techniques refer to accurate costing and budgeting, and thus more accurate management decisions. These techniques are divided into:
* Activity-Based Management
* Activity-Based Costing
* Budget-Based Costing.

Third: These techniques refer to reducing costs in the design phase and other stages of the value chain process to achieve competitive advantage in dimensions related to price, time, and quality. These techniques are divided into:
* Target Costing
* Value Engineering
* Continuous Improvement

Fourth: These techniques refer to providing financial and non-financial information, metrics, and indicators to measure various processes to achieve quality and improvement. The economic unit is divided into:
* Theory of Constraints technique
* Benchmarking technique
* Balanced Scorecard technique

Fifth: These techniques refer to reducing costs at all stages of the value chain, which will lead to increased profitability. These techniques seek to understand customers' perceptions of products and services from the design stage to the after-sales stage and are divided into:
* Value Chain Technique (VCA)
* Product Life Cycle Technique (PCC)

A group of studies can be identified that have undertaken to demonstrate the importance of the subject, including:

1- Study (Elias and Abdel-Naeem, 2016):
Title of the study: The Importance of Green Products in Industrial Organizations (Toyota Corporation as a Model)
Objective of the study: This study aimed to analyze the most important activities related to green products and to analyze the position of green products at Toyota, with reference to the Prius, a hybrid car known as the "green car" and characterized by its availability of technologies that reduce toxic gas emissions.
Conclusions: The connection between green production and marketing becomes clear through the implementation of environmentally conscious production systems. These systems prioritize the protection of natural resources and the environment

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throughout the manufacturing process, which has led to the development of new marketing ideas under the umbrella of green marketing. A green product is one designed with environmental preservation in mind—whether during its production or throughout its use. It doesn't necessarily mean the product is of superior quality or completely free of environmental impact. Instead, it refers to a product that has been adapted to be more eco-friendly while still aiming for profitability through environmentally driven improvements in the production process. This approach involves proactive strategies that prevent pollution before it occurs, making it a more sustainable method of production..

2- (Al-Jadri), 2018:

Study Title: Using Green Target Costing and Decomposed Analysis to Reduce Costs and Achieve a Competitive Advantage.

Study Objective:

*. To shed light on how to obtain environmentally friendly products using decomposed analysis techniques.

*. To clarify the role of decomposed analysis in providing essential information that may help achieve a green target cost.

Conclusions

*. Applying green target costing helps deliver products that benefit the customer, the economic unit, and society as a whole.

*. A green product has four main dimensions: reducing energy consumption, conserving resources, preventing pollution, and using renewable energy.

*. Using a decomposed product analysis contributes significantly to analyzing the product's components and determining the function of each existing part. It also helps determine the possibility of replacing some parts with others that achieve the same or higher quality and environmental characteristics that add value to the customer.

3-(Jamal), 2020:

Study Title: The Role of Green Product Policy in Achieving a Competitive Advantage for Algerian Institutions Certified to ISO 14001: A Case Study of a Sample of Algerian Institutions.

Study Objective: To identify and provide appropriate recommendations for those in charge of Algerian economic units regarding the adoption of a green product policy and its effective direction towards competitive service.

Conclusions:

*. There are significant relationships between green product activities and the combined competitive advantages of the institutions studied. This is in addition to the measures taken by environmentally committed economic units regarding their production processes, products, and the fate of these products, including their ability to be recycled internally and externally, not to mention the degree of customer adoption.

*. There is a significant correlation between green product activities and the quality dimension. This is in addition to the fact that the economic units studied have made improvements to their products and production processes, and that environmentally friendly products have different characteristics than traditional products, particularly in terms of life cycle and price. This calls for more conscious improvements on the part of the consumer, who will, in turn, sacrifice more money to obtain the desired environmental benefits.

4. Al-Kanani (2021)

Study Title: Application of Quality Function Deployment to Improve Product Value Using Green Target Costing Techniques

Study Objectives:

*. To demonstrate the role of green target costing in contributing to the provision of an environmentally friendly product at a cost that meets customer expectations in one of the factories affiliated with the State Company for Textile Industries in Hillah (the plastic and woven bags factory).

*. To raise awareness of the importance of its tendency to provide environmentally friendly products due to its positive impact on human health in particular and the environment in general.

Conclusions:

*. Costing is an essential technique for controlling products in the initial stages.

*. The use of green target costing, through a combined effort of quality function deployment and value engineering, achieves consistency between meeting customer desires, which are represented by obtaining an environmentally friendly product at an appropriate price.

3. Bijan, 2021:

Study Title: (How to Use Target Costing for Green Products to Achieve Contemporary Industrial Requirements)

Study Objective: The research aims to identify the technology and mechanisms for implementing green logistics services in the production of environmentally friendly products. This is done to provide the necessary information to help achieve the green target cost, in addition to presenting a field study of the company.

Conclusions:

*. Costing is defined as a technique for pricing green products based on the price of the traditional product with a specified price premium.

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*. The green target costing technique is most appropriate for producing green products, since the product costing process begins during the initial product planning stage.
*. One of the most important factors that contributed to the trend toward the use of target costing is the environment in which the economic unit is located, such as an environment characterized by rapid change.

6-Abdulsalam @Oudah-2022

Study Title: Integration of the Green Target Costing System and Value Engineering in Achieving Sustainable Development (A Study Applied to the State company for Fertilizer Manufacturing)

Study Objective: The study aimed to identify the best appropriate solutions to the identified shortcomings and problems facing economic units, the most important of which are product-related environmental issues.

Conclusions:

*. The purpose of the application is to develop environmental sustainability, and it is likely to be a useful technique for helping to determine the allowable cost of products so that customers are not willing to incur additional costs when purchasing products.
*. Value engineering techniques are a methodology for the technical evaluation process of a product to eliminate unnecessary costs and add value while maintaining or re-improving the product's quality and performance.
*. This technique achieves a large number of important performance outcomes, for example, cost reduction, reduced work time, faster completion, in addition to product or service quality and significant improvement in performance and value.

7- Al-Ghannam's Study, 2023

Study Title: (A Study and Analysis of the Just-in-Time (JIT) Production System and Its Impact on Cost Reduction in Egyptian Companies)

Study Objective: The overall objective of this research is to determine the return and cost resulting from using the Just-in-Time (JIT) production system. Several objectives branch out from the main objective, as follows:
*- Present the concept, objectives, elements, and requirements of the Just-in-Time (JIT) production system.
*- Analyze and demonstrate the impactful relationship between the use of JIT and the reduction of total costs for industrial companies.
*- Explain the most important areas of cost reduction under the JIT system.
*- Prepare and implement a field study to identify the most important determinants of JIT in general, and production costs, waste, and spoilage in particular.

CONCLUSIONS AND RESULTS:

*- Implementing the Just-in-Time (JIT) production system leads to a reduction in all types of inventory, which leads to the diversion of investment into areas that improve the company's cost performance. Its implementation also leads to the elimination or reduction of activities that do not add value to the product, which is reflected in the reduction of direct costs within the company.
*- Implementing a just-in-time production system reduces the cost of production orders and reduces the cost of waste, damage, and defects.
*- Previous studies have shown that recent developments in the business environment require production systems that are compatible with developments in the surrounding environment, with the aim of providing performance measures and standards that achieve companies' objectives in making strategic decisions.

8. Bishtawi's study, 2014

Study title: (Strategic trends for the integration of the costing and management systems based on their costing (ABM) and ABC)

Study objectives: The study aimed to study the strategic trends for the integration of the costing and management systems based on their costing (ABM) and (ABC), in a way that serves the requirements of the information age environment and reduces the cost of customer performance and service provision. The researcher will focus on studying the role of each of the two systems in the continuous development and improvement of the procedures for providing various services. For customers, which leads to reducing the cost of banking services, maintaining the survival and continuity of banks operating in Jordan, achieving their goals, and controlling them.

RESULTS AND CONCLUSIONS:

*Cost and administrative accounting systems have become conditional on change according to the nature of the environment in which banks operate. It is noted that the birth of cost and management systems based on activities came - according to a new environment for business organizations in general and banks in particular - characterized by intense competition and a high degree of Excellence in performance, service provision, and data processing, which has led to increased administrative needs for non-traditional accounting information that encompasses all aspects of business activities.

*The change in service provision, which was due to the automation of technologies, has changed the nature of the activities carried out by a group of workers in

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performing and providing banking services, and its repercussions on the decrease in the size of the workforce employed in monitoring, improvement, and development activities, as well as the possibility of reducing costs and cycle time. The life of services and raising the size of the workforce to the first level called the Intellectual Elite, which increased the interests of management in creating systems with detailed procedures and outputs characterized by accuracy and objectivity in specialization and measurement, which were represented by the costing systems and management based on activities (ABM & ABC).

*The application of costing systems based on activities helps adopt the target cost (Target Costing), as it helps accurately during the analysis and identification of operations activities and determining their cost drivers (and the initial final) from facilitating the process of calculating the target cost based on the variables of the target price and the target profit margin of the services, thus supporting the organization's profitability goal for customers.

9. Al-Ubaidi - 2022

Study title: (The integration between green target cost and value engineering to achieve competitive advantage)

Study objective: This study aims to verify the extent to which the integration of green target costing and value engineering contributes to achieving a competitive advantage. The study uses a qualitative approach by reviewing relevant studies and literature. The study results indicate that green target costing is an important method for controlling products and their costs in the early stages before the actual production process begins. This contributes to the provision of green products with high environmental specifications and appropriate costs. Therefore, the integration of green target costing and value engineering contributes to the provision of green products that meet environmental specifications at an appropriate cost, achieving a competitive advantage. The study recommends the use of value engineering to support the green target costing methodology to achieve the maximum possible goal.

CONCLUSIONS AND RESULTS:

*. The green target costing technique applies target costing within the framework of the green economy, i.e., it determines the cost based on the price the customer is willing to pay while achieving quality, taking into account environmental issues represented by the efficient use of resources and the reduction of waste, emissions, and emissions.

*. The green target costing technique can reduce costs by eliminating unnecessary costs that have negative impacts on the environment.

*- The existence of strict environmental laws is one of the obstacles to implementing green target costing.

10- Salem's study, 2021

Study title: (The Impact of Using Resource Consumption Accounting on Improving the Quality of Accounting Information: A Survey Study at the General Company for Textile Industries, Wasit)

Study Objectives

*. To identify the concept, objectives, principles, benefits, and steps of resource consumption accounting.

*. To examine the impact of using resource consumption accounting on improving the quality of accounting data, through studying the benefits and advantages offered by the application of resource consumption accounting and their impact on the characteristics of information quality.

Results and Conclusions:

*. Resource consumption accounting has an impact on the quality of accounting information, as it provides detailed information about resources and their utilization.

*. Resource consumption accounting provides information relevant to decision-making, as this information is concerned with allocating costs to resources.

*. Resource consumption accounting information is characterized by accuracy and closeness to the company's reality, thus being error-free, as it represents realistic data about the company's resources. The higher the accuracy of the information, the greater its quality.

*. Resource consumption accounting significantly supports cost management decisions, as the information it provides aids in cost planning and improves resource utilization to serve the company's productivity and profitability.

11. Study by Saad, Hassan (2019)

Study title: (Value chain technology and its role in reducing product costs / An applied study at the General Company for Automotive and Equipment Manufacturing - Mechanical Factory)

Study objectives:

*. Explain the cognitive foundations of value chain technology.

*. Explain the role of value chain technology in reducing costs.

RESULTS AND RECOMMENDATIONS

*. Value chain analysis represents a systematic process that continually improves value and eliminates

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unnecessary activity costs that do not add value to the customer. This process reduces costs while maintaining the required level of quality and maximizing customer perceived value.

*. The lack of any application of cost management techniques, including value chain technology (at the General Company for Automotive and Equipment Manufacturing - Mechanical Factory).

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