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The Role of The Integration Loop Between Target Costing and The Theory of Constraints in Enhancing Competitive Advantage

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Abstract: Customers have become more knowledgeable and demand high-quality products at reasonable prices. As a result of the intense competition in the business environment, the decline in available resources, and the desire of companies to obtain a larger market share and internal and external growth and expansion, it was necessary to confront the requirements and use efficient and effective tools. This is what contemporary strategic cost management provides. The researchers combined the techniques of product life cycle cost and target cost within an integrated framework within a series of continuous administrative and technical integration rings to support the company's competitive advantage. Among the most important tools used are successive steps to integrate between the product life cycle cost and the procedures for deriving the target cost for men's suits in the ready-made men's clothing factory in Najaf Governorate, and limiting the costs of the men's suit life cycle and reaching the market target cost of (48,000) dinars to support the factory's competitive advantages to achieve the theoretical and procedural research objectives. The researchers concluded that the integration ring between these tools supports and enhances the factory's competitive advantages. One of the most prominent recommendations was the importance of applying contemporary techniques and methods to reduce costs

and improve product quality, in addition to achieving a competitive advantage in light of the fiercely competitive market.

Keywords: Sustainable target costing, theory of constraints, competitive advantage, and contemporary strategic costing tools.

Introduction: With the increasing intensity of competition in local and global markets, especially after the opening up of countries' economies to each other, it has become necessary for companies aiming to survive and continue to develop and/or develop their competitive capabilities on an ongoing basis to keep pace with developments in the contemporary business environment and thus secure a competitive position that guarantees their survival. Therefore, companies operating in a highly competitive environment must employ more effective and efficient technologies and methods to reduce costs and improve the quality of product features early in the life cycle. This is to meet customer desires, satisfy their diverse needs, and gain competitive advantages that provide companies with a superior position in the market and achieve a larger market share, generating ongoing profits. This can be achieved by employing an integrated approach between contemporary technologies that focus on the cost aspect and the importance of managing this element efficiently and effectively. Consequently, this approach links strategic product life cycle costing and strategic target costing, both of which are considered among the most important strategic cost management techniques. This research aims to shed light on these cost-effective techniques as supporting tools for achieving and strengthening a company's competitive advantage. Chapter One: Scientific Research Methodology

1-1: The Research Problem

Intense competition has become a defining feature of the contemporary business environment, forcing companies to reconsider their product structure to keep pace with the high-quality, low-priced products offered by competing companies. Hence, the importance of the role of the integration loop between strategic cost management tools emerges, most notably the product life cycle. This contemporary technology seeks to reduce costs, specifically reducing product costs throughout its production life cycle. The goal of the product life cycle technology converges with the target costing technology for the product, as long-term planned costs enable companies to enter and remain in the market and compete successfully with rival companies. Companies seek to generate competitive value that distinguishes them from others by creating new competitive advantages for their products, both locally and globally. Therefore, the research problem can be formulated with the following question: Are traditional costing systems compatible with the competitive environment? Also, can companies' competitive advantage be strengthened by using the integration loop between the product life cycle technology and the target costing technology? 1-2: The Importance of the Research

The importance of the research stems from the increasing intensity of competition witnessed by the industry at the local and global levels, the need for companies to keep pace with the latest developments in production processes in a manner that achieves a competitive advantage in the contemporary business environment, and the need to create harmonious administrative integrations in an attempt to link product life cycle technologies with target costs to strengthen the company's competitive advantage.

1-3: Research Objectives

The primary objective is to identify the role of the integration link between product life cycle technology and target costing technology in strengthening companies' competitive advantage by:

1. Introducing the literature on product life cycle technology at its various stages (before, during, and after production).

2. Identifying the literature on strategic target costing and modern approaches to cost reduction, comparing them with traditional costing.

3. Explaining the literature on competitive advantage, its importance to companies, and the factors influencing it, as well as its sources and most prominent determinants.

4. Explaining the theoretical technical integration that ensures achieving a competitive advantage in light of product life cycle and target costing technologies.

5. Harmony and compatibility between theoretical and practical integration by defining sequential logical steps that clarify the practical aspect of the research, accurately arriving at the life cycle costs of men's suits, and then determining the market target cost for the suit, which must be adhered to to achieve the factory's competitive advantages.

1-4: Research Hypothesis

The research is based on the main hypothesis that "Using the integration loop between product life cycle technologies and target costing helps companies reduce costs and achieve efficient management of their available economic resources in a manner that achieves a competitive advantage and sustainable survival in

competitive local and global markets."

1-5: Research Limits

The research limits are divided into spatial and temporal limits as follows:

First: Spatial Limits: The spatial limits of the research are represented by the selection of a men's clothing factory in Najaf Governorate, one of the factories of the Ministry of Industry and Minerals in the Republic of Iraq, due to its importance in meeting the needs and requirements of the local market in Najaf for contemporary men's clothing (men's suits) of acceptable quality.

Second: Spatial Boundaries: The financial data for 2023 were selected as they are suitable for application and have been audited by internal audit, in addition to being audited by an official body, the Federal Board of Supreme Audit.

1-6: Procedural Research Model

The researchers designed a procedural model that illustrates the integration between the three research variables, as follows:

Section Two: Target Costing - A Conceptual Introduction

2-1 The Origins of Target Costing

Target costing emerged in Japan in the early 1960s. Japanese industrial experts developed an American concept called Value Engineering, which American industry relied on during World War II as an engineering approach to rationalizing production costs and transforming them into a dynamic system for cost reduction and profit planning. At that time, it was called Target Costing, and its development had the greatest impact on the superiority of Japanese companies and their unique competitive advantage, giving them a lead in the competition. The United States began using the target costing approach with its integrated components in the late 1980s, as a result of its products losing many markets and its inability to compete with Japanese competition. The 1990s were considered one of the most successful periods in the development of the target costing approach. Researchers focused on studying and establishing the conceptual framework of target costing in an attempt to crystallize its concept and strategic dimensions, and to determine its suitability in the ever-changing and evolving modern industrial environment. This led to the possibility of using it to increase the effectiveness of the strategic management accounting system and support the company's competitive position. Its application expanded to many developed countries after experiments in Japan proved to be highly successful, leading some to attribute the superiority of Japanese industry and its ability to compete with major industrial nations to the pioneering application of this costing approach. In light of the fierce competition facing all companies, and the clear shortcomings of traditional costing systems and their inability to provide effective cost control and achieve real cost reductions, adopting costing systems based on the target costing approach becomes the most effective means of achieving competitive costs, which supports the cost management strategy. The basic requirement of administrative costing systems and the company's strategic management is the innovative thinking of those responsible and the desire to implement radical changes, or at least significant changes in systems, processes, and influential activities, with the aim of continuous improvement in quality and performance and real cost reduction to achieve customer satisfaction and happiness (Feil, et al., 2004: 10-11). 2-2 The Concept of Target Costing

In fact, the process of establishing a specific definition for target costing appears difficult due to the clear discrepancy between definitions from one writer to another. It is noted that many Japanese schools do not agree on a specific meaning for target costing. Therefore, there are several definitions that can be summarized as follows:

Kato, citing Al-Moussawi, defined it as "the process of determining the cost of new products that meet customer desires in terms of price and quality by examining all reasonable ideas regarding cost reductions during the planning and design phases" (Al-Moussawi, 2007: 27). Target costing is also defined as a cost management tool aimed at reducing product costs during the planning, development, and design phases. As a result, this tool attempts to reduce costs during the design phase of the product life cycle due to the speed and magnitude of savings that can be achieved at that stage compared to subsequent phases, while maintaining production quality and customer confidence and satisfaction (Ghanimi, 2014: 20). Target costing is defined as "a cost planning and management tool aimed at reducing total product costs within the framework of comprehensive profitability and selling price planning, given the product's level of quality and customer satisfaction through the optimal and efficient use of human resources" (Babker, 2015: 85).

Monden views target costing as a profit management tool, defining it as "the company's broad profit management activity during the new product development phase, which includes:

1. Planning products that meet customer satisfaction.

2. Determining target costs (including target investment costs) for the new product to achieve the desired target

profits in the medium and long term, given current market conditions.

3. Developing methods to ensure that product design achieves target costs and meets customer needs for quality and prompt delivery" (Feil et al., 2004: 11).

From the above, it is possible to note the diversity of definitions of target costing from one researcher to another. Some view target costing as a costing process for new products, a cost management tool aimed at reducing product costs, a cost planning and management tool aimed at reducing total product costs, and a profit management tool. However, all researchers agree on the importance of meeting customer needs, maintaining required quality, and reducing costs to achieve a competitive advantage.

2-3 Reasons for the Emergence and Application of Target Costing

The reasons for the emergence and application of sustainable target costing can be identified through the following: (Al-Samarrai et al., 2012: 106)

1. Increasing competition among alternative products.

2. Increasing cooperation with suppliers and the emergence of large alliances.

3. Improving product quality from the supplier through to its delivery to the customer.

4. Improving the ability to manage costs and profitability during the short product life cycle.

2-4 Advantages of Target Costing

The application of target costing technology contributes to achieving the following advantages (Al-Khafaji, 2008: 23):

1. Helping to enhance the process of delegation of authority from upper to lower levels of management, regarding product development and operational processes.

2. Helping to achieve competitive advantages for companies, such as cost reduction and improved product quality.

3. Helping to shape the company's competitive future by designing and manufacturing products that achieve prices that lead to the company's success in a competitive market.

4. Using numerous methods that work to achieve targeted cost reduction, such as value engineering, decomposition analysis, and continuous improvement of costs.

5. Applying a team approach to achieving target costs. Team members typically consist of designers, engineers, customers, manufacturers, marketers, and accountants, who aim to achieve specific target costs for the product at a specific level of quality and to achieve the product's functional characteristics.

2-5 Target Costing Principles

The main principles that form the scientific framework for sustainable target costing are as follows: (Al-Rakabi, 2010: 10-12)

1. The target market price is the cost driver.

This means that the market price is determined first, and then the target cost is reached according to the following equation: Target market price = Target profit margin + Target cost. The considerations involved in determining the target market price include that the price be acceptable to customers, that it be competitive compared to the prices of other similar products, and that it cover the cost of the technology used.

2. Focus on customer interests.

Customer needs and desires regarding product quality, cost, and delivery time are important elements for any company wishing to maintain its market share and achieve a competitive advantage. A study should be conducted before commencing production to answer some of the following questions:

What are the customer's interests and desires?

What is the importance of the product's functions or features from the customer's perspective?

Do the product specifications meet the customer's needs, and which needs are not being met?

How does the product differ from competitors' offerings?

What additional services does the company offer to the customer?

3. Control Costs from the Beginning

Target costing is a proactive technique for determining product costs. It determines the allowable production cost, sales price, and target profit margin before production. Therefore, the focus is on the product design stage, ensuring that it includes functions that meet the customer's desires and needs while simultaneously producing within the allowable cost. This is the complete opposite of the traditional costing system, which determines the product cost based on the production stage and subsequent stages, i.e., after the product is produced.

4. Control Costs at All Stages of the Product Lifecycle

Under target costing, the value chain system, including the supplier value chain, is analyzed and studied by forming a team of individuals with expertise, specializations, and various engineering and non-engineering functions. The team consists of individuals with expertise, specializations, and various engineering

and non-engineering functions. The team consists of activities related to planning and design, manufacturing, marketing, internal and external purchasing, distributors, services and equipment, cost accounting, legal aspects, and others (Al-Rikabi, 2010: 10-12). 2-6 Steps and Levels of Target Costing Implementation

The product development process using the target costing technique can be described as a continuous cycle divided into four successive steps (Al-Moussawi, 2007: 56-62):

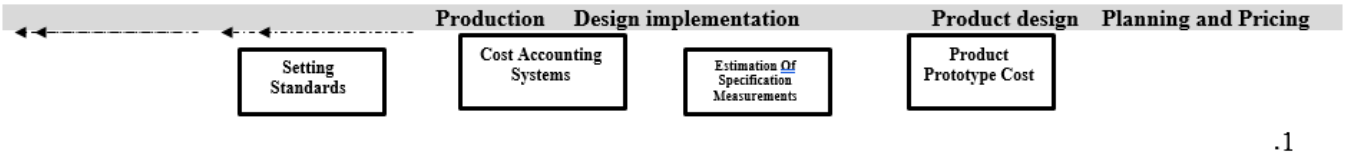
1. Product Planning: This involves drawing preliminary lines based on the expected performance of the product, as well as size, weight, shape, and color, which constitute a rough estimate of the target costs.

2. Basic Design: This involves preparing additional basic plans for the product, including design ideas and the basic cost reductions that can be achieved in this process.

3. Detailed Design: After the foundations for product design are established, a detailed design is developed for the product components that are drawn and necessary to achieve cost reductions.

2. Design Implementation: In this process, the initial product lines are transformed into the assembly process of components to produce the final product. Figure (1) illustrates these processes.

Figure (1): Steps of the Target Costing Technique



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Source: Prepared by the researchers.

The target costing process is carried out at three levels: the market level, the production level, and the formation level, respectively. These levels are intertwined with numerous influences, some of which are external, such as customer desires, and others internal, such as technology. The following is a discussion of these three levels:

1. Market Level: The first level leads to determining the target selling price of the product. It represents the beginning of the target costing process and consists of a single stage: the idea stage.

2. Production Level: The second level is divided into two stages: the technical stage and the functional stage. Through the technical stage, the technical form of the product is crystallized by defining it in detail to determine design options. The outcome of this process is the provision of a clear, technically required strategy that aligns with functional, quality, and cost issues. The functional stage, on the other hand, develops the prevailing products and processes to ensure that the target manufacturing, quality, and costs are achieved on time. 3. Formation level: At this level, the target costing technique begins by creating product structures and determining the costs of models and purchase prices for external parts. It is divided into two stages: the design stage and the implementation stage (Al-Moussawi, 2007: 62). Chapter Three: The Theory of Constraints - A Conceptual Introduction

3-1 The Concept of the Theory of Constraints

The increasing competition and industrial and technological progress that emerged in the last century presented the management of economic units with significant challenges. To address these challenges, they require the use of modern strategic costing techniques, including what is known as the "Theory of Constraints," which stipulates the development of a maximum production plan in light of multiple constraints (Ahmed, 2014: 60). The Theory of Constraints outlines techniques that attempt to maximize operating income when confronted with operational processes, which generally represent "constraints or bottlenecks" (Horngren et al., 2009: 1263). The Theory of Constraints can be defined as a strategic management technique that helps companies effectively improve the product life cycle and production time as a critical and important factor. Through this, raw materials are converted into finished products and profitability is maximized through management focused on addressing bottlenecks or constrained resources (Al-Kawaz and Youssef, 2012: 504). The researchers can define it as a contemporary strategic cost management technique that focuses on managing production time within the product value chain. Addressing any bottlenecks, constraints, or resources that hinder effective product lifecycle improvement and increase the company's operating profits.

3-2 Benefits of Applying the Theory of Constraints

Applying the Theory of Constraints has multiple positive benefits for the company, perhaps the most notable of which (Brigawi, 2014: 219) are the following:

1. Working to dramatically increase production while

implementing some changes in operational processes.

2. The Theory of Constraints is one of the most important tools for encouraging teamwork across the company, manifested by the team's awareness of constraints and the need to work together to prepare for the process of eliminating these constraints.

3. The Theory of Constraints provides immediate and tangible benefits.

4. Improving service quality and enhancing the company's competitive position in the business environment.

5. Ease of developing an effective market strategy and making key operational decisions.

6. Achieving and enhancing the company's operating profits by reducing inventory levels and identifying bottlenecks.

- 3 Principles of the Theory of Constraints

The Theory of Constraints is based on a set of principles that form the foundation of its practical framework. The most important of these principles are the following (Al-Maamouri, 2020: 415-416):

1. The level of output achieved based on the unconstrained resources is determined by the level of the system's constrained resources.

2. The utility and effectiveness of the system are complementary. Utility represents the full operation of the unconstrained resources to reduce waste, while effectiveness represents the system's ability to achieve its objectives regardless of the level of energy used in the production process.

3. The time margin achieved at the level of constrained resources is equal to the increase in the rate of output of the constrained resources.

4. The time margin achieved at the level of unconstrained resources is a complete illusion, because the increase in wasted time means an increase in inventory.

5. The transfer impulse may not equal the production impulse, as the transfer impulse indicates the amount of resources transferred from one production process to a subsequent production process. It is usually less than the production impulse, given the amount of resources produced between work centers and departments.

6. The production impulse should be variable due to the difference in capacities between production processes, which results in bottlenecks or constraints in the production process.

3-4 Steps for Implementing the Theory of Constraints

The theory of constraints is implemented through a set of main steps, which are as follows:

1. Identifying constraints or (diagnosing the basic system constraint): Constraints that may be hindering the possibility of optimal manufacturing are identified. In other words, the weakest link is identified. It is also noted that more than one weak link is identified, and the weak link is selected through continuous improvement procedures, and so on for the other weak links in the system (Al-Kawaz and Youssef, 2011: 504).

2. Determine how to manage constraints or (exploit constraints): The goal is to ensure full exploitation of all details related to the constraints, which may in turn be reflected in increasing the output of the bottleneck point and, consequently, the output of the company as a whole. This is achieved by identifying all operational requirements and determining how to manage the constraints identified in the first step to increase the margin of achievement (Surur, 2019: 385).

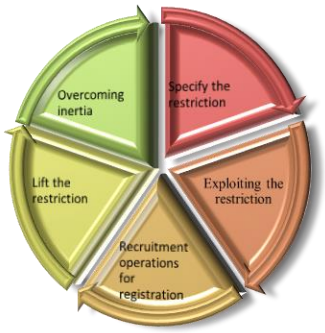
3. Support all other processes by the necessity of exploiting the constraints or (employing processes for the constraints): Activities subordinate to supporting the exploitation of the constraints are directed by modifying and controlling all other activities and components within the system, helping to achieve the maximum possible effectiveness and productivity of the constraints, even if it requires reducing the production speed of resources that are not the centers of the constraints (Ahmed, 2014: 61).

4. Work to increase the effectiveness, efficiency, and capacity of constraints (lifting the system constraints), or more precisely, treating the constraints or eliminating the constraints, i.e., breaking the constraints (Horngren et al., 2009: 1272).

5. Referencing Constraints or (Searching for New Constraints): The concept of continuous improvement within the theory of constraints requires that when a discovered constraint is overcome or its impact on the system is removed, a second constraint may emerge, but it may not be as strong. Consequently, the first step must be returned to, and the process of identifying the causes must be continued and repeated (Al-Yamour, 2010: 416).

The figure below illustrates the five steps of continuous improvement and addressing constraints using the theory of constraints.

Figure (2): Steps of the five-dimensional theory of constraints.



Source: Prepared by the researchers.

Section Four: Competitive Advantage - A Conceptual Introduction

4-1 The Concept of Competitive Advantage

Competitive advantage has been defined in the specialized literature in multiple ways. Harvy (1986) defined it as "the source that enhances a company's position in the market, achieving profits through its superiority over its competitors in the areas of product, price, cost, and production focus."

Czepiel (1992) viewed it as "the ability to deliver superior value to the market for an extended period of time, typically longer than the design-manufacture-market cycle of the industry." McGahan (1994) defined it as "the performance of companies' activities more efficiently and effectively than competitors." Others defined it as "the means by which a company can win its competition against others" (Bishtawi and Jarrah, 2015: 184). 4-2 The Importance of Competitive Advantage

Interest in competitive advantage is growing in today's world with the intensification of competition and the increase in global trade conflict, which forces various companies to differentiate themselves and gain new ground in the large global market. Competitive advantage refers to the characteristic that distinguishes a company from other competitors and establishes a strong position vis-à-vis various stakeholders. Any company can achieve competitive advantage in many ways, but the most important methods are for the company's products to be low-cost (produced at competitive costs and sold at a low price), cost leadership, or for the company to be able to distinguish its products physically (product innovation), differentiation, or impression (advertising, name, and reputation) (Al-Bishtawi and Jarrah, 2015: 185).

Thus, the importance of competitive advantage is demonstrated through the following (Shaarawy, 2021: 63):

1. Generating and adding value to customers and meeting their needs, ensuring their loyalty, and providing and improving the company's reputation and image.

2. Achieving strategic differentiation compared to competitors in the products and services provided to customers, and excelling in resources and competencies in a highly competitive environment.

3. Increasing market share and profitability, generating new marketing opportunities, and a strong focus on creative innovation.

4. Entering a new competitive field, such as entering new markets, dealing with a new type of customer, or developing a new type of product or service.

5. Forming a new vision for the future of achievable goals and exploiting available opportunities.

6. Enhancing the ability to deal with all variables effectively and efficiently by possessing the characteristics and capabilities that qualify companies to achieve excellence and achieve goals.

7. Constructive shift from a policy of covering the local market to global markets.

8. Encouraging proactive research and development activity and shifting from the search for solutions to existing problems to a policy of seeking elements of excellence, leadership, and knowledge.

4-3 Factors Affecting Competitive Advantage

Companies work to achieve competitive advantage through the products and services they offer. Competitive advantage here refers to the ability to meet customer needs or the value they desire from that product. However, achieving competitive advantage is not always a simple task, as it is subject to two basic factors, namely (Mohammed, 2004: 26-27):

1. Comparative Efficiency: This refers to a company's ability to produce products or provide services at a

lower cost than competitors. This factor is influenced by several key factors, the most important of which are:

A. Internal Efficiency: This refers to the internal costs incurred by the company.

B. Reciprocal Organizational Efficiency: This represents the costs incurred by the company as a result of its dealings with other companies.

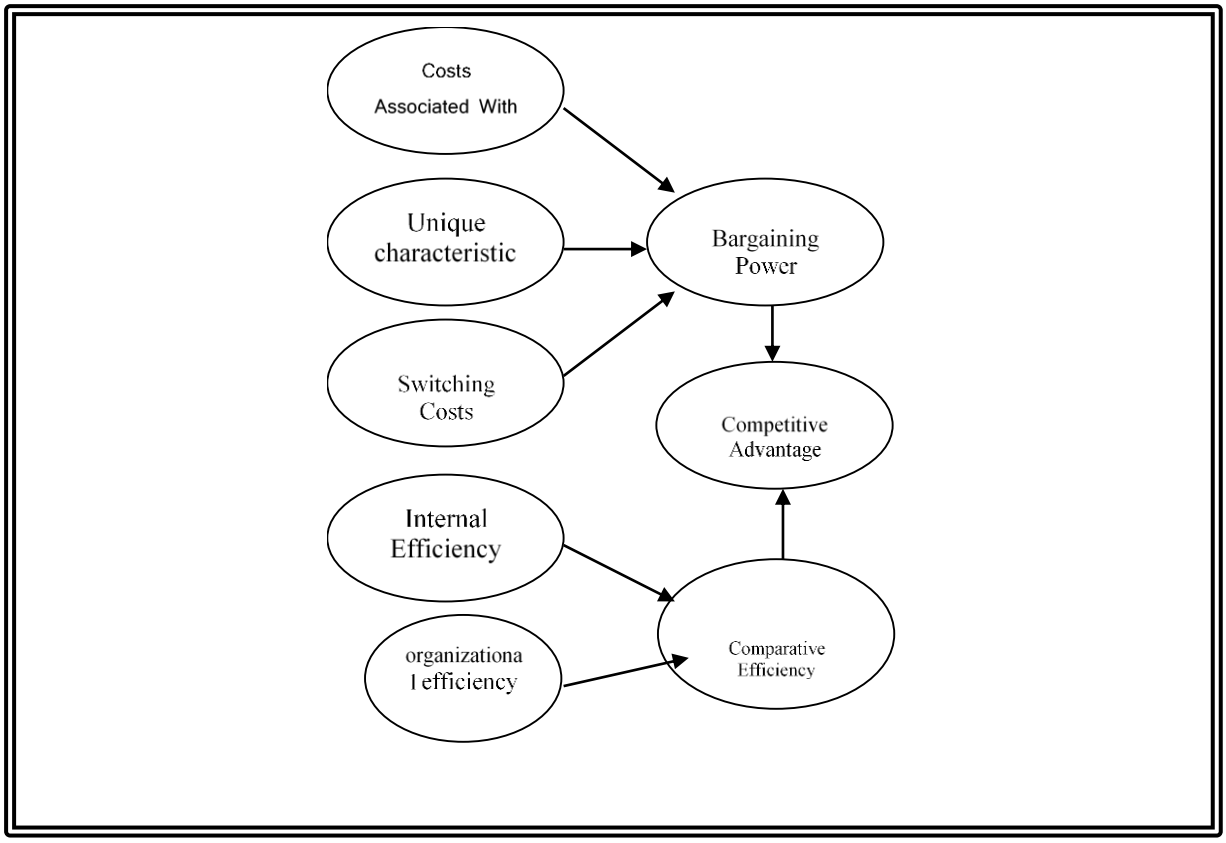
2. Bargaining Power: This allows the company to bargain with its customers and suppliers to its advantage. This factor is influenced by several key factors, the most important of which are:

A. Costs Associated with Research and Development: This represents the marketing costs of the company, suppliers, and customers.

B. Unique characteristics of a service or product: The characteristics of an organization's products or services that make them different from those of competing companies.

3. Switching costs: The costs incurred by customers as a result of refraining from dealing with those competing companies. This can be illustrated in the following figure.

Figure (3): Factors affecting competitive advantage



Source: Mohammed, Suad Jassim, Target Costing: A Tool for Achieving Competitive Advantage, a study published in the Journal of the College of Administration and Economics, Issue 3, University of Baghdad, 2012.

4-4 Sources of Competitive Advantage

Achieving competitive advantage requires linking a company's internal capabilities with external capabilities. This means that the sources of competitive advantage are internal (representing the company's capabilities, skills, and resources), and external (representing the general environment), activities, skills, and internal material supply, as an open system consisting of inputs, processes, and outputs that make any part of the system a source of competitive advantage. The economic unit must strive to achieve a competitive advantage that matches its own capabilities and potential (Hraiga et al., 2023: 4).

Failure to identify a competitive advantage through which it can compete with other companies operating within the same environment will threaten its existence and survival in this intensely competitive environment.

The most important sources of competitive advantage can be identified as follows (Harrison, 2002: 18):

1. Low costs: A company can achieve a competitive advantage by offering products and services at affordable prices. Low or at the same prices.

2. Distinctive Service: This refers to the company's provision of distinguished products and services, generating complete customer satisfaction and preference over competing products. This also includes the addition of significant features and advantages to

the product or service provided by the company.

3. Technology and High Performance: This refers to the company's production of distinguished products/services with high levels of performance, service, and growth that competing companies cannot match. Examples of this include world-renowned consulting firms.

4. Quality: Quality refers to the degree to which the design characteristics of products and services are appropriate for function and use, as well as the degree to which the product/service matches the design characteristics. This refers to the company's provision of high-quality products with an appropriate level of reliability that is difficult for competing companies to imitate.

5. Service: This refers to the company's provision of high-level services that competing companies cannot offer. An example of this is the services provided by PC, a personal computer manufacturer.

6. Culture or Leadership: The leadership, training, and selection methods within a company can be described as a source of competitive advantage because they lead the company to provide innovative products with high levels of service that can keep pace with rapid new developments in the market. Furthermore, company culture is also considered a source of competitive advantage. A source of competitive advantage, as understanding corporate culture is essential if the company is to be managed strategically.

7. Growth: This occurs through the company expanding in size or introducing new products to new markets, which is reflected in the growth of its market share, a factor in competitive superiority.

8. Time: Time is a source of competitive advantage through which companies compete. This is due to the increasing importance of time to both companies and customers, especially when introducing new products to the market. Time plays an important role due to rapid market changes, which require rapid response.

4-5 Conditions for Achieving Competitive Advantage

Researchers identify five basic conditions for companies to achieve competitive advantage, as follows (Al-Samarrai et al., 2012: 131):

1. It must be unique or achieve a significant superiority over its competitors in the competitive market.

2. It must satisfy the desires and needs of existing customers for long periods.

3. It must be continuously developed to ensure customer retention and attract new customers.

4. It must have a market and achieve increased market share. and profitability.

5. It must be difficult for competitors to imitate within a short period of time.

-6 The Integration Between Target Costing and Theory of Constraints and Their Role in Enhancing Competitive Advantage

Target costing and the Theory of Constraints (TOC) are two strategic approaches in management accounting aimed at improving companies' financial and operational performance. They can be combined in an integrated cycle to enhance competitive advantage by monitoring and controlling costs and improving the company's operational efficiency.

First: The Integration Between Target Costing and Theory of Constraints

Target costing is a management approach, approach, or technique based on:

A management approach that determines the maximum acceptable cost based on the target market price and desired profit.

It focuses on efficient product design by reducing waste and improving efficiency in the early stages of the product life cycle.

This approach requires collaboration between different departments, such as production, marketing, and design, to achieve the planned cost without compromising quality.

Meanwhile, the Theory of Constraints focuses on:

It focuses on identifying the limiting element (bottleneck) in production processes and improving process flow to increase productivity and maximize profitability.

It improves the operational capacity of limited resources rather than simply reducing costs, leading to increased returns in the long term.

It relies on a continuous improvement methodology (diagnosing and analyzing bottlenecks, focusing, and utilizing resources efficiently).

Second: Integrating the two approaches to enhance competitive advantage

1. Achieving a balance between cost reduction and process improvement:

Target costing reduces costs through design and planning, while TOC enhances productivity by optimizing process flow and eliminating bottlenecks or constrained resources.

2. Improving the company's responsiveness to the market:

Target costing ensures that the final product price matches customer requirements, while TOC ensures this goal is achieved through the optimal use of

resources.

3. Reducing waste and increasing productivity:

Target costing helps eliminate unnecessary costs, while TOC prevents operational slowdowns and improves the utilization of constrained resources.

4. Achieving sustainable profitability:

Rather than focusing solely on cost reduction, combining the two approaches leads to improved production structure and increased return on investment.

Therefore, target costing can be applied when designing a new product or developing an existing one. Its cost is determined based on market research. The theory of constraints is then used to identify any production bottlenecks, such as a shortage of raw materials or the inefficiency of some machinery. Operations can be restructured to improve productivity, reduce waste, and rationalize resources. With this integrated approach, a company can achieve a strong competitive advantage by offering low-cost products without sacrificing quality or efficiency. This is what the researchers will attempt to demonstrate in the applied aspect of the research. Section Five: The Practical Aspect

Introduction

In this section of this research, we aim to apply the theoretical aspect or framework reviewed in the previous sections, to clarify the practical procedures for the integration link between product life cycle costing and target costing, and to demonstrate their role in enhancing and strengthening the competitive advantage of the economic unit. This will be applied to the men's clothing factory in Najaf, for several reasons, including the role and importance of this factory in the industrial sector in Najaf and its support for the Iraqi economy. The factory contributes to meeting market demand for men's clothing in Najaf Governorate and nearby governorates, as well as the factory's need to develop its strategies to reduce costs and improve product quality to meet customer requirements, thus strengthening and enhancing the factory's competitiveness. We focused the practical application on analyzing the factory's data for the year (2024) due to the completeness and availability of this year's data. The factory produces a variety of products, as we were able, through inquiries and questions from the planning and production departments, as well as our review of product records and statements.

First - The reality of the production system in the factory and its prospects Its development

The production system consists of departments specializing in production operations and other departments that support manufacturing processes and provide raw materials and other requirements for the production of standardized products. These departments include:

1- Design and Template Preparation Department: This department specializes in model creation activities (design), relying on the personal innovations of designers or publications from international and Iraqi fashion houses. Designs submitted directly by clients are often adopted. Regardless of the design method, approval of the implementation of the designed model or template is granted by an evaluation committee designated for this purpose.

This is followed by the mold preparation process, based on which the technical equation (Bill of Materials) is determined for the materials (fabrics) and other supplies used in the production of the product. The department also includes the size development process, through which the optimal use of fabrics and other supplies is studied with the lowest rates of damage.

2- The Cutting and Preparation Department: The department includes seven tables equipped with specialized machines for spreading fabrics to facilitate efficient inspection using vertical scissors, according to the patterns implemented and approved by the Design Department. This process involves:

- Reinforcing certain parts of the pattern with adhesive lining.
- Numbering parts and cutting packages according to the approved system.
- A complete and accurate inspection of the pre-cutting procedures is carried out, with quality control being monitored.

3- The Technology Department: This department is responsible for determining the technological path for the specific product, i.e., distributing the required production processes across the necessary production stages, preparing workers with the required skills, and determining time and movement details.

4- Programming Department: Prepares annual, monthly, and daily production plans and programs production across all departments to achieve balanced flow. It also provides all sewing supplies, utilizing an electronic computer system in its operations.

5- Sewing Department: The department consists of (13) production lines, each specialized in producing a specific quality of clothing models. Each line includes a clear division of stages and operations performed using specialized and conventional machines. The sewing department includes ironing operations for both parts and the final product using specialized equipment for

each type of product.

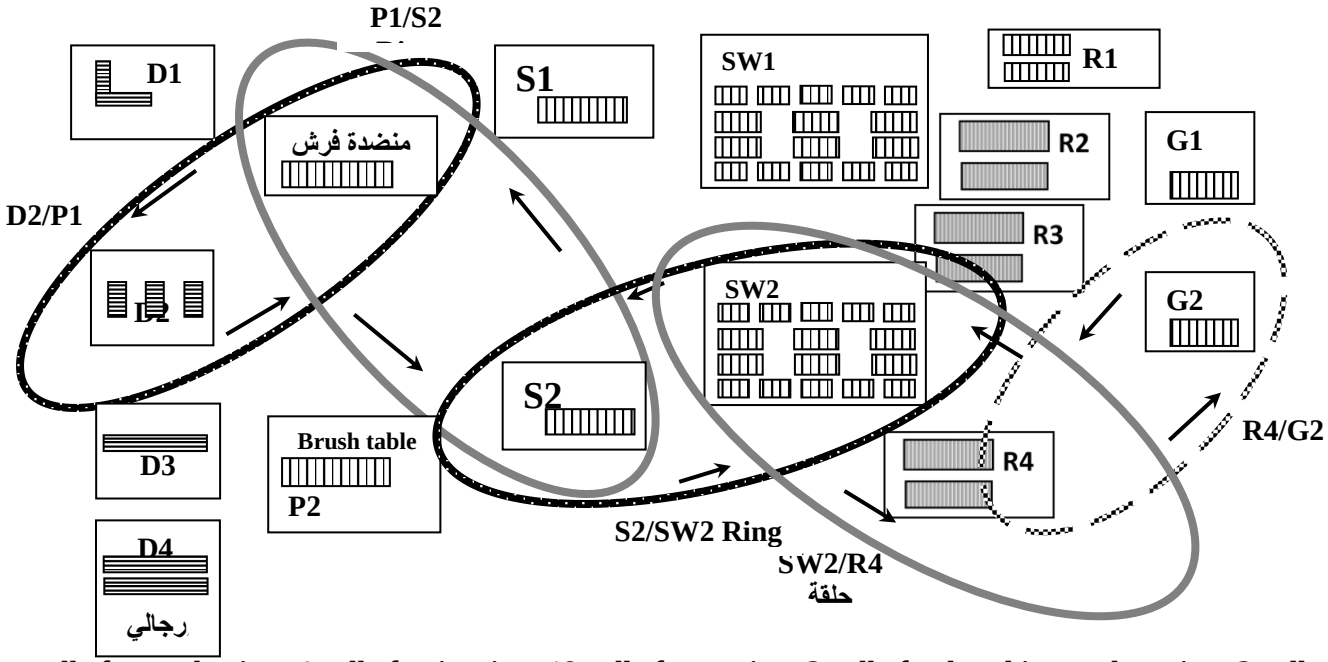
As for the supporting departments that assist production processes in achieving the system's objectives, they are as follows:

1- Quality Control Department: This department includes a group of workers distributed across the production departments who carry out inspection activities and ensure that materials, parts, and the final product are accurately matched to approved specifications. The laboratory relies on comprehensive inspection (100%) of all products and their components throughout all stages of production and operations. 02. Training Center: This center trains employees in sewing and tailoring skills, both at the start of their employment and through retraining and skill enhancement.

03. Maintenance Department: This department is responsible for maintaining machines and equipment and replacing spare parts.

04. Engineering Services Department: This department plays a key role in providing electricity, compressed steam, and lighting, and contributes to providing other service requirements.

The Product Complexity Network in Figure (1) illustrates the path to transformation and development toward an efficient factory. Typically, standardized products that compete on the basis of price generate only small profits compared to products produced on demand. Meanwhile, durable products are described as products that are not in constant demand, and their production process must be flexible enough to meet customer requirements.



2cells for packaging, 4 cells for ironing, 18 cells for sewing, 2 cells for brushing and cutting, 2 cells for preparing templates, 4 cells for design

شكل (4)

نموذج دورة حياة المنتج في المسار التكنولوجي لإنتاج

المصدر: من إعداد الباحثين

Although producing standard products represents the first essential step for many factories, the transition from standard products to durable, custom-made, or highly specialized products is possible by making changes to adapt the manufacturing environment to the goals of the philosophy to which they are moving.

The management of the Najaf Men's Clothing Factory has attempted to adapt its production processes to remove constraints. This adaptation involves adding optional parts or components to the original product.

The optional components or changes include development and design processes, as well as manufacturing and delivery processes. This makes the product a custom product, all to address the factory's severely declining market share.

The factory (the case study) can design new products for all production processes, according to customer desires and needs. Such products are of particular value to customers, who are willing to pay a higher price because they meet their specific preferences. Second: Case Study: Production of a Product Without

Restrictions:

The case study involved researchers following the process of implementing a work order to produce a product, starting from the direct order's arrival at the factory until the final product was completed, as follows:

1. On April 20, 2024, an agreement was reached with the party that submitted the direct order to implement a contract to produce a product with specifications specified by the customer and at specific prices. The factory determined the delivery time in agreement with the customer.

2. On April 26, 2024, the Design Department began preparing and implementing the prototype according to the following procedures:

Designing the prototype took two days after it was matched to the specifications agreed upon in the contract.

The designed prototype was not subject to evaluation by the relevant committee because it was submitted directly by the customer. Therefore, the prototype was approved for implementation on April 28, 2024.

3- Within the same period, the Technology Department began, specifically on April 27, 2024, preparing the technological process for the product's operations. The department also determined the time required for each process, each stage, and each unit of the product.

4- The process of preparing the molds for the work product took seven days. Based on this stage, the quantities of raw materials and additional supplies required to manufacture the product were determined. The technical equation for the product was prepared according to the specified steps and levels of the technological process, as shown in Table 1, to obtain accurate results and quantities of materials and parts used in the product's production.

Table (1)

Technical equation for the product* (work jacket)

Card POLCA	Notes	Time Minute	Quantity	Description	Level
R4/G2	Finished Product	72.2	1	Final Product (Work Jacket)	**0**
SW2/R4	Assembly Part	2.5	1	Front of Final Product	**01**
SW2/R4	Assembly Part	4.5	1	Zipper Ruler	**002**
S2/SW2	Purchased Part	0.7	1	Cleanse Adhesive	**0003**
S2/SW2	Purchased Part	7.0	1	Zipper (50 cm)	**0003**
S2/SW2	Detailed Part	0.6	3	Fine Model	**0003**
S2/SW2	Detailed Part	0.6	3	Rough Model	**0003**
SW2/R4	Assembly Part	2.5	1	Right Part	**002**
S2/Sw2	Detailed Part	1.48	1	Right Chest Pocket	**0003**
SW2/R4	Assembly Part	0.18	1	Chest Pocket	**00004**
S2/SW2	Detailed Part	3.2	1	Right Hand	**0003**
S2/SW2	Assembly Part	1.5	1	Right Pocket	**00004**
Sw2/R4	Detailed Part	1.2	1	Hand Knee Reinforcement	**00004**
S2/SW2	Detailed	3.2	1	Left Part	**002**

	Part				
S2/SW2	Finished Product	**1.48**	**1**	Left Chest Pocket	**0003**

Table (2)
Technical Equation of the Product

Card POLCA	Notes	Time	Quantity	Description	Level
S2/SW2	Detailed Part	3.2	1	Left hand	**0003**
S2/SW2	Detailed Part	1.5	1	Pocket/Left hand	**00004**
SW2/R4	Assembly Part	1.2	1	Knee reinforcement	**00004**
SW2/R4	Assembly Part	5.3	1	Back of finished product	**01**
S2/Sw2	Detailed Part	1.0	1	Back sole	**002**
SW2/R4	Purchased Part	1.7	44cm	Elastic	**002**
SW2/R4	Assembly Part	1.0	2	Hand/back part	**002**
S2/SW2	Detailed Part	3.28	1	Collar	**01**
SW2/R4	Purchased Part	0.07	1	Cleanse adhesive	**002**
S2/SW2	Detailed Part	0.03	1	Label	**002**
SW2/R4	Assembly Part	1.2	2	Collar part	**002**
S2/SW2	Detailed Part	6.5	2	Jordan	**01**
S2/SW2	Detailed Part	0.3	2	Jordan reinforcement	**002**
S2/SW2	Detailed Part	1.2	2	Rough model	**002**
S2/SW2	Detailed Part	0.18	2	Jordan arrow	**002**
S2/SW2	Detailed Part	**1.2**	**2**	Fine model	**002**

Source: Laboratory data, adapted by the researchers.

*: The term used in the laboratory as a substitute for the technical composition of the product.

1- On May 16, 2024, the Tailoring and Preparation Department began laying out the fabrics on the tables in preparation for cutting the pattern for the jacket. The cutting process for the full batch, equal to the quantity required and agreed upon in the contract, took a full week. The laboratory uses a fixed batch size equal to the quantity agreed upon with the designated party. The laboratory uses a transfer batch between stages equal to the size of the mattress and the number of approved fabric layers.

2- On May 17, 2024, the production line began sewing the jacket. Following the production line, it became clear that the laboratory uses a large production batch, perhaps equal to the order quantity, and a transfer batch between stages and sewing operations equal to the size of the mattress designated for each line, with strict emphasis on a comprehensive inspection of all produced parts (100%) before moving between operations. The sewing stage operations and actual processing times, in addition to the preparation times

for each operation, can be indicated as follows: Real time (processing + preparation) minutes

Table (3): Product production stage times

Real-time (processing + initialization) minutes	Process Name
7.0	01 Oversealing Process for Parts Included in the Product
2.5	02 Marking Process
2.5	03 Cleaning Processes for Parts of Threads
14.5	04 Sewing Processes
13.0	05 Fitting Process
2.5	06 Jacket Pinning Process
4.5	07 Side Appliqué
2.5	08 Cutting and Turning Parts
7.0	09 Inspection Processes
6.0	010 Ironing Processes
62.0	Real-Time Processing

Source: Specific times in lab schedules. Regarding the allocated production capacity, (4) production lines were used in the sewing phase on the same date (May 17 to June 5), as follows:

Daily production capacity = 7.5 hours 60 minutes = 450 minutes per line

Available production capacity = (processing time for the critical process in the line) 450 / 7 = 64 units

Therefore, the allocated production capacity for this product = 64 (4) lines = 256 units per day

Producing 3,000 units took 16 actual working days

Allocated production capacity for the period = 256 16 = 4,096 units

Capacity utilization rate = 3,000/4,096 100 = 73%

1- The product packaging department received the product after sewing and ironing, and it underwent a comprehensive inspection of the materials and components included in its composition. However, the final product is inspected during the packaging phase, focusing on specifications. The appearance is then completed, and the final product is packaged.

2- (3,000) units of final product were delivered on June 5, 2024, to the main warehouse unit, deemed ready for delivery to the customer.

The lead time is calculated as the average time required to process the order, i.e., from the date of agreement on the contract, April 20, until June 5. The following formula can be relied upon (Leon, 2000, p. 11):

Lead time = Queue time (QT) + Mean time to process a job (Tj)

Where:

QT: represents the average waiting time for a work order (i.e., from the time the order arrives until processing begins).

Tj: is the average time to process a work order, including the preparation and processing time for all parts in the production batch.

 Lead time to production = Waiting time + Processing time for all parts in the batch.

3,000 units of product = 5 days + 32 days

= 37 days.

Based on the above, it can be said that waiting times represent a large proportion of lead times, as the actual processing time plus preparation time at all stages is represented by the following:

Table (4): Work time

One day	Model building (design) took place
One day	Mold preparation
One day	Technical route configuration and construction
16 days	Sewing department used 73% of the energy
One day	Packaging

Therefore, after removing a portion of the waiting time in office and production operations, the lead time

becomes 20 days, and the percentage reduction in lead time is 46%.

Third - Measuring the Effects of Reducing Lead Time

Reducing lead time is accompanied by economic savings in costs, according to operational indicators of the production system, after removing other constraints, as follows:

1. A significant reduction in work-in-progress inventory between stages.

2. A reduction in finished product inventory.

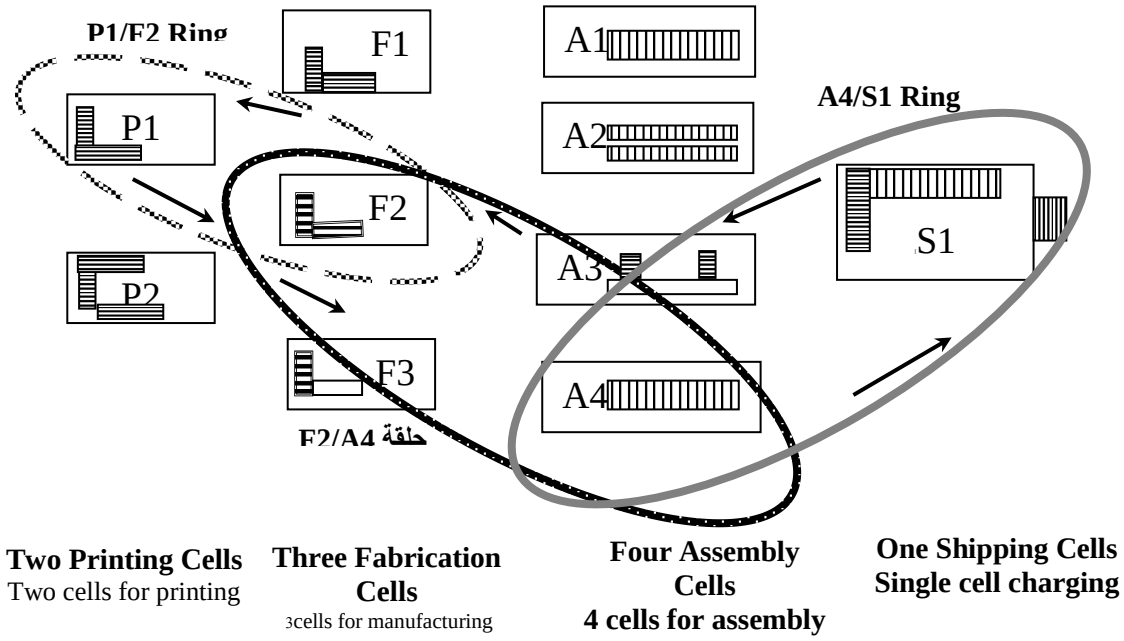
3. A reduction in direct labor.

4. A reduction in overtime, perhaps even a complete non-requirement.

5. A very significant waste reduction.

The researchers adopted the indicators in Table 4 based on mathematical equations adopted by the Rapid Response Center as a final step in removing constraints. However, due to the inability to provide the necessary data from the application environment, despite numerous attempts, the table indicates indicators at the level of overall factory activity and the level of operational processes, demonstrating the impact of reducing lead time after removing constraints. As a result, the floor space used for production operations can be reduced, especially after arranging and organizing production facilities according to groups or "cells," as a primary requirement to eliminate constraints, rather than production departments in the factory (case study), which increase the waiting time for work orders. Figure 5 represents a proposed design for arranging production facilities according to the principles of eliminating constraints.

Figure (5): Interlocking loops and POLCA card movement



Source: Suri, Rajan, Quick Response Manufacturing: A competitive strategy for the 21 st century, proceedings of the

2002, POLCA Implementation wok shop.

It works as follows:

01. Establish groups of planned products, focusing on age groups (boys, youth and girls, men, and women), with each group focusing on a segment of the market and attempting to develop the product within that framework. Each group has its production line consisting of a group of cells.

02. Implement the POLCA mechanism to control the flow of materials and parts during production processes and reduce waiting times by creating a closed loop linking every two cells together and throughout the technological process of producing each product category.

03. Establish a unit called Demand Management, responsible for receiving direct orders from customers

and planning their production within a rapid response framework, utilizing information and communication technologies to achieve its objectives.

04. Use computer-aided design technology, supporting the design department in the laboratory with engineering and design skills and efficient research and development activities, and utilizing an integrated database that includes:

A. Product specifications for each of the approved categories.

B. Engineering standards.

T- Technical Structure (BOM)

05. Building integrated relationships with suppliers inside and outside the country to achieve rapid response to customer needs.

06. Activating the role of activities supporting the production process and implementing continuous improvements to increase their efficiency in providing services.

Implementing Target Costing

Target costing is implemented through organized, sequential, and well-thought-out steps, relying on realistic data from the market and competitors. These steps are as follows:

First. Determining the product research sample: The men's suit was chosen as the research sample based on the importance of this product among the products of the "Al-Najaf Ready-Made Men's Clothing Factory." The target group for this product is employees, university professors, business people, and youth.

Second. Determining the target price: When analyzing market prices for competing products, we found a discrepancy and variation in the prices of men's suits in the markets and for competing products. Table 3 illustrates the most important competitors' prices, as follows:

Table (5): Prices of competing products in the Iraqi domestic market

Sales percentage	Details	Average price (in dinars)	Suit Type
%52	They are of medium to high quality and are among the most attractive and best-selling suits on the market.	60,000	Turkish Jacket
%17	They are of poor to medium quality, have a low price, and have a low sales rate.	20,000	Chinese Jacket
% 31	They are of medium to high quality, have a relatively low price, and have a low sales rate.	35,000	(Second Door)
		115000	Chinese Jacket

Source: Prepared by researchers based on personal interviews with some shop owners.

We find variations in the prices of men's suits in the markets of Najaf based on their source and quality. Turkish suits are of medium to high quality and are popular among consumers. Chinese suits are divided into two categories, as shop owners call them "first-class" and "second-class" suits. The first-class Chinese suit is a suitable economical option, characterized by a variety of designs and quality, and is the best-selling suit. The second-class suit is characterized by poor quality, a low price, and low sales. In light of this information, the target price can be determined based on the average prices of competing products in the market. The target selling price for a single men's suit would be 60,000 dinars. The average price was used because it represents the most accurate price in this market and can eliminate price fluctuations and variations. It was found using the equation:

Third. "Determining the Target Profit": The target profit is determined based on the desired profitability ratio within the economic unit. These units set a profit margin of between 15% and 20% of the target selling price. Given the intense competition in the Najaf market for men's suits, a profit margin of 20% of the target selling price was chosen. Therefore, the target profit is 12,000 dinars.

x= 〖60,000〗 ^ ×20%=12,000

Fourth: "Calculating the Target Cost": The target cost is calculated by subtracting the target profit from the target price. For the men's suit in question, the target cost is 48,000 dinars.

x=60,000-12,000= 〖48,000〗 _^0

The results of applying product lifecycle costing and target costing systematically and thoughtfully demonstrate the precision in analyzing costs and dividing them according to the product lifecycle stages. This reflects clarity in tracking and distributing costs,

which contributes to improved resource management. The implementation of the target cost and setting it at (48,000 dinars) achieves consistency with average market prices, supporting the competitiveness of the men's suit of the "Men's Clothing Factory in Najaf Al-Ashraf" in terms of cost efficiency per suit. The cost per unit (22,035 dinars) based on total costs (3,312,963,898 dinars) and the number of units produced (150,350 suits) indicates the achievement of high production efficiency, thus enabling competitive profits. This is in addition to aligning the product with the market and adopting a target price based on market analysis and competitor prices, which reflects a realistic understanding of market trends and consumer needs. The low unit cost Compared to the target costing, it provides an opportunity to enhance profitability or improve the product to support the competitive advantage of the men's clothing business in Najaf Al-Ashraf. The success of the application of methods by applying the product life cycle costs and the application of the target costing for cost management enhances production and marketing efficiency. This makes this application a practical example that can be adopted to develop other products in the men's clothing factory in Najaf. This supports and proves the research hypothesis based on the fact that the application of product life cycle costs and the application of the target costing in an integrated manner supports the competitive advantage of companies.

c Section Six: Conclusions and Recommendations

CONCLUSIONS

1. The total lifecycle cost of the men's suit product amounted to 3,312,963,898 dinars, with a unit cost of 22,035 dinars. The production phase (manufacturing) represents the largest proportion of total costs, which requires a focus on improving production processes to reduce costs.

2. The target price for the men's suit, using the target cost, is 60,000 dinars, based on average market prices. The target profit is 12,000 dinars per suit, resulting in a target cost of 48,000 dinars, demonstrating the potential for achieving competitive profitability targets.

3. Competing products (Turkish and Chinese) vary in quality and price, making the average-quality local suit a suitable option for most of the target group.

4. Target costing is a tool that emerged as a result of the continued growth in competition as an applied approach to cost management. It is a pricing method whereby a target cost is determined based on the premise that price drives cost. It also contributes to focusing on product and process design, taking into account all costs related to the product's life cycle.

5. Competitive advantage is the extent to which companies are able to perform their activities in a manner that surpasses that of their competitors and is difficult to imitate, leading to the creation of high perceived value for the customer and value for the company.

6. Target costing begins with a target price, which enables it to compete in the market by reaching the cost and reducing costs to achieve long-term profit. This is in contrast to other traditional costing methods that begin with cost to reach price and do not focus on reducing costs.

7. The goal of companies in monitoring and reducing their costs, controlling and rationalizing them, and adopting specific strategies is the essential point that ensures they maintain this competitive advantage. However, this can only be achieved through the company's study and understanding of the target costing method and the most important steps upon which it is based, which include setting a target price and profit margin. 6-2: **Recommendations**

Based on the previous findings, the study recommends the following:

1. It is necessary to find solutions to reduce and lower production (manufacturing) costs by reducing raw material waste and improving the efficiency of direct industrial work.

2. We recommend that the management of the Najaf Men's Clothing Factory implement modern and contemporary cost and management techniques to increase productivity and reduce indirect industrial costs. They also recommend focusing on techniques and methods that improve product quality (men's suits) to reach the level of Turkish products while maintaining competitive costs.

3. It is necessary for the management of the Najaf Men's Clothing Factory to adhere to the target price of 60,000 dinars for men's suits to ensure customer attraction and achieve profitability and competitiveness goals. They also recommend offering competitive advertising and promotional offers to gain a higher market share compared to competitors.

4. It is necessary to follow a set of steps, including offering a product that meets customer desires, then setting a target price based on the customer's perceived value of the product and competitors' prices, determining the target profit margin, and then setting the target cost.

5. Companies need to implement target costing due to the benefits, advantages, and competitiveness it brings in light of global economic and technological developments.

6. It is essential to activate the elements necessary to implement this integrated approach further, utilize currently available elements as a preliminary step toward its implementation, and work to remove obstacles to the implementation of this integrated approach from strategic costing tools.

7. It is essential to adopt new technologies and methods to reduce costs and improve product quality, as well as achieve a competitive advantage in the fiercely competitive market.

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