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Designing an Advanced Product Life Cycle Approach in Manufacturing Companies

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Abstract

The product life cycle is particularly important for all companies. All manufactured products go through a product life cycle. Focusing on the product life cycle and quality helps attract customers and increase sales. The product life cycle consists of four stages: introduction, growth, maturity (saturation), and decline. The purpose of this study is to design an advanced product life cycle approach for manufacturing companies. It is a qualitative and exploratory research study. In this study, interviews were conducted in 2024 with 10 experts, including faculty members, management accountants, and accountants, selected through a purposeful method. Based on the findings, an advanced product life cycle approach was designed. The study results indicate that, according to experts, the advanced product life cycle approach consists of five stages: introduction, growth, maturity, redesign (reengineering), and decline. This approach helps manufacturing companies make strategic decisions by better understanding their product's position in the market. Moreover, by anticipating and planning for the redesign phase, companies can prevent premature product decline and extend its lifespan.

Keywords: Product life cycle, Experts, Redesign, Manufacturing Companies.

JEL Classification: D24, M11, M41, D51, F1

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INTRODUCTION

Life cycle costing was first used by the US Department of Defense in 1960. The purpose of life cycle costing at that time was to assist the Department of Defense in the procurement and provision of military equipment. The use of this method at that time by the Department of Defense showed that nearly 75 percent of the total system costs were costs other than the initial acquisition and construction costs. These costs often included operating and maintenance costs that would occur in the future (Brindle., 2005). The product life cycle theory was first introduced in 1950 to describe the expected life cycle of specific products from the design stage to obsolescence. Carol Haden states in the book Marketing Tools that this cycle is divided into four stages on the curve, introduction, growth, maturity (saturation) and decline, and its goal is to increase the value of products and profitability at each stage and is mainly considered as a marketing theory (Nazeri., 2012). It includes revenues and costs that can be directly attributed to the product throughout its entire life cycle. The life cycle costs of a product include all costs attributable to the product from design to final exit from the market. The more accurate the cost of a company's goods sold, the more accurate its profit and loss will be, and therefore, a better assessment of the company's performance can be made and better ways to improve it can be thought of (Stark, J., 2015). Therefore, in this study, we will examine another costing method called product life cycle. This method is very useful in companies and businesses that have high research and development costs. Each product has a life cycle that can be divided into five stages: development, introduction, growth, maturity and decline (Levitt, T., 1965). In the development stage, the research and design process take place and some costs are incurred in this stage, but there is no income for the product yet (Day, G. S. 1981). In the introduction stage, the product is introduced to the market. Potential customers are initially unaware of the product or service, and the organization may have to spend a lot of money on advertising to get the product or service noticed in the market. In addition, capital expenditures may be made to increase production capacity as sales demand grows. In the growth stage, the product attracts more profit and market share as demand increases. Revenue increases and the product moves towards profitability (Kotler, P., & Armstrong, G. 2018). In the maturity stage, when sales have peaked and become relatively stable, demand for the product will decline and it enters a period of relative maturity. This should be the most profitable stage of the product life cycle. As a means of maintaining demand and extending this stage of the product life cycle, it can also be modified or redesigned. In the decline stage, the market has purchased the product, and as a result, the demand for the product reaches its lowest point, and the product will eventually become unprofitable, and at this point the company must stop producing it (Rink, D. R., & Swan, J. E. 1979). In today's competitive world, manufacturing companies face numerous challenges. Increasing customer expectations, shortening product life cycles, increasing product complexity, and the need for continuous innovation are among these challenges. To survive and succeed in this dynamic environment, companies need to adopt new and efficient approaches to product life cycle management. Traditional approaches,

which often focus on separate stages of design, production, and support, no longer meet the complex and changing needs of the market. Therefore, designing an advanced approach that can manage all stages of the product life cycle in an integrated and coordinated manner, is essential and vital. Therefore, the main issue of this research is to design an advanced approach that can help manufacturing companies in Iran to manage their product life cycle more effectively by solving these problems and achieve success in today's competitive market. This approach should be based on the principles of integrity, agility, intelligence, sustainability, and customer orientation, and should utilize modern technologies in the best possible way. The purpose of the research is to answer the following question: Can the product life cycle in manufacturing companies be improved?

METHODOLOGY

The present research method is a combination of qualitative and quantitative approaches. In the first stage of the research, the content analysis method was used, and in the second stage, the experts were asked for their opinions through semi-structured interviews. Using open, axial and selective coding methods, relevant concepts and categories were extracted and initial indicators were identified. Semi-structured interviews were conducted with experts in the field of management accounting in order to complete and enrich the indicators identified in the content analysis stage and discover possible new dimensions. The experts included 10 management accountants and financial managers of manufacturing companies and members of the academic staff. The experts were selected based on a purposive sampling method.

RESULTS

The purpose of this study was to design an advanced approach to the product life cycle in manufacturing companies. The stages of the product life cycle are: the stage of introducing the product to the market, the growth stage, the maturity stage, and the decline stage. In this study, which was conducted through interviews with experts, the advanced model of the product life cycle was approved by the experts. The findings of the study show that the experts have approved the addition of the fourth stage (reengineering) to the stages of the product life cycle. If, in the post-maturity stage of the product life cycle, product redesign with a value creation approach for the customer is added, manufacturing companies will not reach the decline and decline stage. Also, they can redesign the product or customer needs and return it to the value chain and sales cycle.

CONCLUSIOIN

According to the research results, it is emphasized that adding a reengineering stage to the product life cycle and focusing on creating value for the customer can save manufacturing companies from entering the decline stage and enable them to continuously adapt their products to market needs.

Contribution of Authors

This study is derived from Ms. Tahereh Sotoudeh's master's thesis entitled "Explanation of the Advanced Product Life Cycle Approach from the Experts' Perspective" at Islamic Azad University under the guidance of Dr. Habib Piri.

Ethical Approval

Informed written consent was obtained from individuals to publish their anonymous information in this study.

Sponsor

This study had no sponsor.

Conflict of Interest

No conflict of interest was declared by the authors.

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