Journal of Innovation and Development
ISSN: 2958-4752 | Vol. 3, No. 1, 2023

An Overview of Production Strategy and Pricing Strategy of Standard and Customized Enterprises

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Abstract: With the development of social economy and the improvement of consumption level, consumers pay more and more attention to the diversification and individuation of products. The progress of digital economy and intelligent manufacturing technology makes it possible for enterprises to produce customized products that fully meet consumers' expectations. This paper systematically reviews the research status of production strategy and pricing strategy of standard and customized products, summarizes the shortcomings of existing research, and points out the direction for subsequent research.

Keywords: Customization; Production Strategy; Pricing Strategy.

1. Introduction

With the development of society and the continuous progress of manufacturing technology, the mode of production of goods is also undergoing continuous evolution and change, from the pre-industrial revolution model of manual manufacturing, through mass production and then to mass customization. As a new mode of production, mass customization combines the advantages of low cost and short delivery times of mass production with the ability to produce bespoke products that meet consumer expectations and fully satisfy their individual needs.

However, the development of a production strategy and pricing strategy can have a significant impact on a manufacturing company. Generally speaking, there are three stages in the development of a production strategy. In the first stage, decisions are made on whether to invest in standard products, customized products or both, based on the market environment, cost structure and other factors. In the second stage, decisions are made on the number of product types for standard products, inventory and lead times for customized products, customization levels and other factors. In the third stage, decisions are made on the pricing of standard and customized products based on a defined product strategy. This paper reviews the research findings on product customization and pricing strategies to date, focusing on the current state of research on the two market structures of complete monopolies and duopolies, summarizing the shortcomings of existing research and suggesting future directions for further research.

2. Research Status

(1) Research on the choice of production methods of firms under conditions of complete monopoly

Alptekinoglu and Corbett showed when there was only one mass customized producer entering the market, i.e., a complete monopoly, the firm would price the product close to the maximum price that consumers were willing to pay for the product. But as long as their initial investment was not too large, the firm could be profitable. Liu et al. extended Alptekinoglu's paper by introducing delivery time into the decision making of mass customized firms, specifying the optimal conditions for firms to enter the market and made decisions on the choice of production methods. Jiang et al. studied the optimal number of product types and their optimal positioning and pricing under mass production and mass customization production models, and also examined the advantages and disadvantages of the two production models. Mendelson and Parlaktürk showed that firms could make more profit under a perfect monopoly market structure, either by increasing production efficiency or by attempting mass customization. Gu and Tayi argued differently, that a monopoly could only provide consumer-tailored products if consumers had sufficient ability to participate in customization, and the firm made more profit by offering consumer customized products than by offering standard products; otherwise, the firm made more profit by offering standard products.

In addition to firms making production or pricing decisions, standard and customized firms under a complete monopoly have been studied at a number of levels. Parisa and Wong segmented customers into those who were concerned with the level of customization and those who were concerned with delivery times, and developed an optimal production strategy for the firm. Basu and Bhaskaran studied how a firm under monopoly conditions offers both standard and customized products, when the firm makes decisions and how to motivate users to participate in co-design. Lian and Ji analysed the degree of customization for mass customization and discuss in detail the relationship between the degree of customization, market demand and the profitability of manufacturers. Esenduran et al. introduced return policies into a monopoly model and find that it was optimal for firms to offer returns for customized products and that they could increase profits and reduce the total demand for returns by offering returnable customized products. Alptekinoğlu and Örsdemir, based on an environmental protection perspective, found that mass customization caused a degree of overproduction that could be detrimental to the environment and provides management insights for firms to promote win-win situations for both firms and the environment. Zhang et al. studied the co-creation of products by manufacturers and customers under monopoly conditions when win-win strategy, the study showed that when the incremental effectiveness of quality was sufficiently low for consumers, a win-win situation occurs when manufacturers and consumers choose different product co-creation options. Wu et al. constructed an evolutionary game model for manufacturers and suppliers in the context of

customization and found that when the level of customization was low, the increase in the level of customization promoted both parties to choose an active cooperation strategy. However, when the degree of customization was too high, the increase in the degree of customization would promote both parties to choose negative cooperation strategies. Zhang et al. conducted a study on whether online customization strategies should be opened up, and eventually concluded that the higher the production cost of customized products, the less incentive manufacturers had to open up customized products.

(2) Research on competition and production strategies of firms under duopoly conditions

Dewan et al. studied the two-stage game and three-stage game between two firms whose respective products were located in a symmetric position in the product space, and compared the firm's profit, customization range, price and consumer surplus with those of a perfect monopoly market. Bernhardt et al. built on Dewan's study and further investigate the effect of brand effects on equilibrium outcomes. Alptekinoglu and Corbett showed by studying a three-stage game problem between two multi-product firms in an asymmetric duopoly market that mass-producing firms offer lower product diversity to moderate the price competition between the two-price competition between the firms. In contrast, Xia and Mendelson further investigated the game problem between mass-producing and mass-customizing firms, taking into account factors such as inventory levels and lead times, and found that the firms' decision-making behavior was closely related to the competitive position they are in.

Yang et al. introduced a concept called 'customer co-creation investment', where they also study the game between firms, i.e., for customized firms, firms consider making investments to reduce the high cost of customer engagement in order to solve the problem of customer willingness to buy, and investigate how the level of investment affects the firm's profit. Zhang and Zheng differed from other studies in that they investigated the optimal customization strategy and product assortment decisions for firms in online and offline channels. By refining the Salop model, it was ultimately concluded that customization was not the only way for firms to achieve strategic excellence. Fei and Zhao studied the competitive environment for standard and customized product firms in a behavior-based pricing scenario, and examined how the adoption of behavior-based pricing influenced firms' product variety, delivery and price decisions, studied the price decisions and profits of two firms in a competitive market, where one firm considers whether to adopt a consumer customization strategy, and used a game-theoretic approach to analyse the equilibrium price and equilibrium profit of each firm. Yazdani et al studied price competition between two mass customization firms, based on the Hotelling model, and analyzed a two-stage non-cooperative game between the two firms, and conclude that competition in mass customization may lead to lower profits and consumer surplus. Li gave the optimal inventory decision of a firm in a perfect monopoly and competitive environment where demand was influenced by consumer preferences for price, delivery time and quality. Li and Lee extended the model to a scenario where firms competed on price and processing time. Webster investigated pricing, lead time and capacity decisions for customized products. In his model, demand played a decisive role in price and delivery time decisions. Xia and Rajagopalan considered the delivery time of custom firms, carved out a perfect Nash equilibrium for the subgame, and argue that increasing consumer sensitivity to product fit may reduce the delivery time of custom products.

3. Conclusion and Research Prospect

From previous studies, the production strategy and pricing strategy for standard and customized products have been studied in depth, but there are still many aspects that have not been studied: 1) From the past literature, most people have only considered two market structures: monopoly and duopoly, however, this is not in line with the real market environment, and in the future, multiple companies can be considered to enter the market to provide standard products or provide customized products. The optimal production strategy and pricing strategy of each firm at this time can be studied. 2)The majority of the literature only examined the optimal strategies of firms under conditions of market demand determination. However, market demand is often uncertain due to the complexity of the internal and external environment and the elusiveness of consumer preferences. Therefore, it is necessary to take demand uncertainty into account.

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