



## Organizational strategy development in distribution channel management using fuzzy AHP and hierarchical fuzzy TOPSIS

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### ARTICLE INFO

#### Keywords:

Distribution channel management  
Distribution organization  
Fuzzy analytic hierarchy process  
Hierarchical fuzzy TOPSIS  
Extent analysis method

### ABSTRACT

Distribution channel management not only consists of choosing distribution channels. In fact, probably the most difficult phase of the distribution management starts after this choice. Determining an appropriate organization strategy for distribution channel management is like a problem of concern to marketing practitioners and academics as well in this phase. In this study, the organization strategy of distribution channel management is developed using fuzzy analytic hierarchy process (FAHP) and hierarchical fuzzy TOPSIS (HFTOPSIS) for an edible-vegetable oils manufacturer firm operating in Turkey. The company distributes its products all over the country. Due to the complex structure of the distribution network, the company wants to decide the organization strategy to manage the distribution channels. In this paper, the methods of FAHP and HFTOPSIS for evaluating and selecting among the five organization strategy models for distribution channel management of vegetable oil manufacturer have been presented. The proposed models include determinants of distribution channel management for edible-vegetable oil industry; (i) customer profile, (ii) distributor reliability, (iii) the position of competitors in market, and (iv) managerial and financial perspective. Using FAHP and HFTOPSIS, hybrid based strategy (KBS), which has the greatest desirability index value after the evaluation among the five alternatives is found as the best choice. Thus, the case of the vegetable oil manufacturer company provides the researchers and practitioners to understand in a better way the importance of developing organization strategy in channel management from a practical point of view.

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### 1. Introduction

The implementation phase of distribution channel management takes place after the design process (Tek, 1997). In other words, the primary firm or manufacturer first chooses her effective distribution channel design and then determines distributors specifically motives and evaluates them in proper situation. To manage the channel there must be a special structure in the primary firm. Here, while firms establish these structures, they must choose suitable organizational structure for aim of distribution channel to compete with other competitor firms and keep their position in the market.

In the literature, one of the popular problems in the distribution channels management field is *choosing distribution channels* (Coughlan, 1985; Coughlan & Wernerfelt, 1989; Crosno, Nygaard, & Dahlstrom, 2007; Eriksson, Hohenthal, & Lindbergh, 2006; Gupta, Su, & Walter, 2004; Kiang, Raghun, & Shang, 2000; McGuire & Staelin, 1983; McNaughton, 1996; Min, 1991; Moorthy, 1986).

On the other hand, in the last few years the attention of academicians and practitioners has changed into how to establish the distribution channel management structures and how to manage and control distribution channels. Webb (2002) investigates the effect of introducing the Internet channel into a complex, multichannel distribution system from the perspective of the supplier firm. Van Bruggen, Kacker, and Nieuwlaet (2005) investigate on how distributors' channel function performances affect their relationships with organizational customers and how the impact of these actions on relationship quality is influenced by the interdependence structure of the relationship. Frey and Holden (2005) investigate the channel management in e-government applications. They propose a point of view on how federal agencies may be able to manage their various channels for e-government. Gensler, Dekimpe, and Skiera (2007) apply a model to assess channel performance of a large home-shopping company. They analyze the performance of its main channels over time, and test for differences in channel performance among different product categories, as well as between different customer segments. Finally, they derive implications for managers to operate a company's multiple sales channels more effectively.

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Kahraman, Ruan, and Doğan (2003) used the FAHP approach in the selection of the best facility location alternative by taking into account quantitative and qualitative criteria. Bozdağ, Kahraman, and Ruan (2003) have used the FAHP approach in the evaluation of computer integrated manufacturing alternatives by taking into account both intangible and tangible factors. Büyükoçkan, Kahraman, and Ruan (2004) employed the FAHP method in selecting the most appropriate software development strategy. Kahraman, Cebeci, and Ruan (2004) used the FAHP process to evaluate and to compare the catering firms in Turkey. Tolga, Demircan, and Kahraman (2005) used the methods of FAHP and fuzzy replacement analysis in the operating system selection problem. Başlıgil (2005) provided an analytical tool to select the best software providing the most customer satisfaction. Kong and Liu (2005) aimed to find out the key factors that affect success in E-commerce using Fuzzy AHP. Kahraman, Ertay, and Büyükoçkan (2006) proposed an integrated framework based on fuzzy QFD and a fuzzy optimization model to determine the product technical requirements to be considered in designing a product. The coefficients of the objective function are obtained from the approaches of Fuzzy analytic network and Fuzzy analytic hierarchy process. Bozbura, Beskese, and Kahraman (2007) have applied FAHP to improve the quality of prioritization of human capital measurement indicators under the fuzziness. Büyükoçkan (2009) proposed an analytic framework to provide practitioners a more effective and efficient model for prioritizing m-commerce requirements.

Büyükoçkan, Feyzioğlu, and Nebol (2008) proposed a multi criteria decision making approach to effectively evaluate e-logistics-based strategic alliance partners. Önüt and Soner (2008) applied a fuzzy TOPSIS based methodology to solve the solid waste transshipment site selection problem in İstanbul, the criteria weights are calculated by using the AHP. Kahraman, Ateş, Çevik, Gülbay, and Erdoğan (2007) developed a hierarchical fuzzy TOPSIS method for evaluating and selecting among logistic information technologies. Ateş, Çevik, Kahraman, Gülbay, and Erdoğan (2006) constructed a comprehensive hierarchical evaluation model with many main and sub attributes and proposed a new algorithm for fuzzy TOPSIS that enables taking into account the hierarchy in the evaluation model. Dağdeviren, Yavuz, and Kılınç (2009) developed an evaluation model based on the AHP and TOPSIS for the selection of optimal weapon in a fuzzy environment. The AHP is used to analyze the structure of the weapon selection problem and fuzzy TOPSIS method is used to obtain final ranking. Öztürk, Ertuğrul, and Karakaşoğlu (2008) proposed FAHP and Fuzzy TOPSIS for the transportation selection problem, in order to take vague nature of the linguistic assessment into consideration. Ballı and Korukoğlu (2009) proposed a fuzzy decision approach based on FAHP and TOPSIS to select appropriate operating system for computer systems of the firms by taking subjective judgments of decision makers into consideration. Seçme, Bayrakdaoğlu, and Kahraman (2009) proposed a fuzzy multi criteria decision model to evaluate the performances of banks. The largest five commercial banks are examined and evaluated in terms of financial and nonfinancial indicators by integrating the methods of FAHP and TOPSIS.

In this study fuzzy analytic hierarchy process (FAHP) and hierarchical fuzzy TOPSIS (HFTOPSIS) methods are used to develop an organizational strategy to manage distribution channels of a vegetable oil producer operating in Turkey.

In Section 2, there is a conceptual outline for developing distribution channels management strategy. The third part includes brief information about the firm and sector of subject. In Section 4, decision structure of the firm and the models of FAHP and HFTOPSIS are presented and finally, the comparisons and results of the considered methods are given in the last section.

## 2. Developing organizational strategies for management of distribution channels

The success of management and distribution strategy directly depends on the success of organizational management structure of distribution channels. Organization has a big importance for management process and can be defined as effective usage of financial and human resources and factors of the firm. While establishing distribution management organization, the activities that are essential to achieve firm's goals, have to be defined well. The approaches of structuring distribution organization can be classified with an analogy of marketing organization (Armstrong & Kotler, 2005; Kotler, 2003; Mucuk, 1997; Roger, Hartley, Berkowitz, & Rudelius, 2005; Ülgen, 1993):

1. *Product based strategy*: Firms that have multiple types of products mostly use this strategy. In this approach distribution network management is structured through the product lines and for every specific product or product line a manager is assigned who is responsible for all management activities for that specific product or product line.
2. *Geographic based strategy*: The big firms that act in broad markets (all national or international markets) can establish their distribution management departments through geographic based strategy. This strategy will be effective if the consumer demands change with respect to region.
3. *Customer based strategy*: Distribution management department is structured with respect to different customer types. Organizational structure looks like as it is in product based structure but here "market managers" work instead of "product managers" For example wholesaler and retailer can differ with respect to their customers. Depending on the specialist about the subject, using detailed information, making coordination easy activities related with customers and effective customer relations are advantages of this strategy. However it also has some disadvantages there may be discriminations among customers because of the competition between departments.
4. *Function based strategy*: Grouping the similar and same type of activities, which creates organization, is called separate with respect to functions. The functional organization distribution management department is established depend on subjects as developing mediators (mechanism that finding mediators to distribution channel as defined before) analyzing the sales (measure the performance of the distribution channel members as vendors) and institutional sales.
5. *Hybrid based strategy*: Sometimes some firms can establish a strategy which is a combination of geographic, product, customer or functional organization strategies. Large number of product type may require product base strategy; while different customer types and demands may require customer-based strategy. The combination of these strategies help to satisfy the different customer demands needs and help the firms to achieve their goals.

The best distribution management organization structure depends on the types of product of the firm, characteristics and demands of the people in target market, and many other factors like these. In this study strategic determinative factors are defined from the perspective of customer profile, reliability of distributors, positions of the competitors in the market, managerial and financial structure.

## 3. Determinants of distribution channel management

Determinants of distribution channel management for edible-vegetable oil industry are proposed as; *customer profile, distributor*

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