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Evaluation and Selection of Market Segments Based on the TOPSIS Technique Application

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Abstract. *Researching and choosing market segmentation is one of the most crucial marketing considerations for every company. For many businesses, choosing a target market is one of the most crucial marketing choices. This choice also has an effect on the market mix, purchasing and distribution plans, as well as other business considerations. A strong target market is selected based on the results of the market segmentation assessment, a variety of parameters, including the size of the segment, the existence of competitors, risk, and profitability are taken into consideration. This article looks at some key segmentation models in respect to the characteristics of industrial markets. Many marketing decisions, including those involving the market mix selection, purchasing, the supply chain, distribution channels, etc., are centered on the target market. Market sector A few steps must be taken to ensure that each market segment's desirability is assessed before one (or more) is selected for entrance. A market is thought to be segmented through this procedure into many subgroups. The target market that can be reached can be chosen as customers and a subset. a distinctive marketing mixture (Cutler and Keller, 2005). As a multi-objective decision-making process, the TOPSIS approach can be used to address questions with numerous objectives. This study suggests that the TOPSIS approach, which has had positive outcomes, be used to assess foreign players when they are introduced to CBA teams. Because of the increasingly competitive industry, businesses must choose wisely when it comes to marketing issues. One of the most important difficulties is the evaluation and choice of market segmentation. The results show that different sectors may have varying success potential and that choosing the best might help firms fulfill their commitment to expanding their operations. This study can be used as a model for future research and the identification of market categories.*

Keywords: market segmentation, market segment evaluation, market segment selection, TOPSIS method

1. INTRODUCTION

When Many marketing decisions, including the market mix, are cantered on the target market. Selection, purchasing, the supply chain, the channels of distribution, etc. market sector Before one (or more) market segments are picked for entry, there are a few methods so that the desirability of each market segment is first assessed. A market is thought to be segmented through this procedure into many subgroups. The target market that can be reached can be chosen as customers and a subset. a distinctive marketing mixture (Cutler and Keller, 2005). Businesses examine their segments and identify their target markets after segmenting the market. Analysing the aforementioned market segments. Market segmentation is now a crucial component of marketing in developed nations and in running any firm (Weddle, Kamakura 2000). Market division is Creating separate client segments inside a market is the definition of a market. You might choose a target market that you can reach using a distinctive marketing approach. The literature has utilized a variety of market segmentation basis, including location, demographics, lifestyle, and product benefits, to divide a market into several divisions (Kazemzadeh et al. 2009). The market can also be segmented using a number of other methods, including as factor analysis, clustering, conjoint analysis, regression, and discriminate analysis. The application of various fields, including as data mining, multivariate statistics analytics, fuzzy logic, artificial neural networks, and genetic algorithms, in market segmentation techniques has increased in recent years. Since it occurs before all other elements of marketing strategy, market segmentation assessment is a vital management decision (Wind, Thomas 1994). Each organization must first examine and choose a target market or markets. Additionally, market segmentation analysis aids in market targeting and is therefore crucial to increase the likelihood of success in a cutthroat market. The examination and selection of market segments typically involves comparing available options to a set of potential criteria. Therefore, the MSE/MSS issue might be seen as an MCDM issue, or a multi-criteria decision-making issue. "MCDM approaches are very useful in many engineering fields and management such as transportation (Cameron Perez et al. 2015; Baric and many others. 2016), location selection (Kouchaksaraei et al. 2015; Ibrahim, Mizrahi Modem 2016), tourism management (Hashemkhani Solfani et al. 2015; Ranjan et al. 2016), Supply chain management (Shahriari Niña et al. 2016), inventory management (Cashwars Ghorabae et al. 2015) and financial management (Shen, Tzeng 2016). Curiosity Readers are referred to a recent review of MCDM methods and their applications (Mardani et al. 2015), a review of MCDM applications in transportation systems (Mardani et al. 2016) and the TOPSIS approach for decision making issue developments By concentrating on two distinct aspects of consumer evaluation of fish quality and their relationships with consumer behavior toward fish, the current research seeks to fill in some of this understanding gap about consumers' assessments of the quality of fish." We do not plan to concentrate on what fish quality means to particular persons in this study because other studies have already focused on the predecessors of quality and quality perceptions. Instead,

we will contend that consumers' personal priority attached to fish quality and their trust in their ability to judge fish quality are two essential notions in the process of evaluating quality. When anticipating customer purchasing behavior, market segmentation is a crucial concept. The notion of a consumer market is used in segmentation. Categorized and identified according to consumer traits. It is crucial to pinpoint market niches for any good or service. It took a while to make sense of it. People hunt for advantages in everything they use.

2. MARKET SEGMENT EVALUATION

An essential step in helping firms better understands their target audiences and boost sales and profitability is market segment evaluation. It entails segmenting a market into smaller consumer segments with comparable demands, interests, or traits. Businesses combine qualitative and quantitative research techniques to assess market segments, taking into account elements including segment size, accessibility, profitability, compatibility, competitiveness, and distinctiveness. Businesses can successfully contact and engage their target clients by determining the most promising market segments and creating tailored marketing strategies, which will ultimately lead to market success. Market segmentation is the process of dividing a market into smaller subgroups of consumers with equivalent needs, interests, or traits. Businesses should evaluate market segments because it will help them better understand their target consumers, focus their marketing efforts on meeting those customers' needs, and ultimately boost sales and profitability. Businesses frequently combine qualitative and quantitative research techniques to assess market segments. Examples of qualitative approaches that can be used to learn more about consumer attitudes, beliefs, and behaviors include focus groups, interviews, and surveys. Data analysis of client demographics, purchasing trends, and other market trends are examples of quantitative approaches.

Here are some key factors to consider when evaluating market segments:

1. Size: Is the segment large enough to be profitable and worth pursuing? Is it growing or declining?
2. Accessibility: Can the business easily reach and communicate with this segment through its marketing channels?
3. Profitability: Is the segment likely to generate a high profit margin for the business?
4. Compatibility: Does the segment align with the business's mission, values, and overall marketing strategy?
5. Competition: Are there many competitors already serving this segment, and how does the business differentiate itself from them?
6. Uniqueness: Does the segment have unique needs or characteristics that make it a particularly attractive market for the business?

Businesses can design focused marketing strategies to reach and engage those customers by taking into account these criteria, helping them to find the most promising market groups for their goods or services. To illustrate how the suggested strategy may be applied, it is chosen to utilize a situation from the real world, one that takes place in a chair manufacturing company. The company chosen, Royal Company, is a well-known name in the Indian chair manufacturing industry. In India's chair manufacturing industry, Royal Company, a leading manufacturer, is the market leader. To illustrate how the suggested strategy may be applied, it is chosen to utilize a situation from the real world, one that takes place in a chair manufacturing company. In the Indian chair manufacturing industry, Royal is one of the well-known brands and the chosen company. To illustrate how the suggested strategy may be applied, it is chosen to utilize a situation from the real world, one that takes place in a chair manufacturing company. In the Indian chair manufacturing industry, Royal is one of the well-known brands and the chosen company. India's chair manufacturing industry is dominated by the well-known manufacturer Royal Company. Royal presently offers more than 50 different types of executive, administrative, and medical chairs based on customer requirements and ergonomic standards. Over the past few years, demand for a number of office chair designs has been steadily rising. It was corporate policy to conduct marketing research to enhance its design process based on significant client preferences for office chairs. Three segments, known as SEG1, SEG 2, and SEG 3, were recently discovered by this market research endeavor. The business must assess and choose the acquired market segments in order to carry out additional marketing activities. As a result, the project team expanded to include two industrial engineers who worked for the company, as well as a manager of R&D, marketing, sales, and other departments. Now the business should assess the segments and decide on just one. It was challenging to consider all the criteria because there were so many of them. The business must assess and choose the acquired market segments in order to carry out additional marketing activities. As a result, the project team expanded to include two industrial engineers who worked for the company, as well as a manager of R&D, marketing, sales, and other departments. Now the business should assess the segments and decide on just one. It was challenging to consider all the criteria because there were so many of them. The five criteria include issues in the competitive, sociopolitical, financial and economic, technological, and segmentation sectors. When choosing each criterion, the planning group also took into account the Indian market situation. The business is a well-known innovator and a significant producer in India's chair manufacturing sector. Royal Company presently produces more than 50 distinct types of executive, administrative, and medical chairs based on customer needs and ergonomic suggestions. Over the past few years, demand for a number of office chair designs has been steadily rising. In order to improve its design process based on the most important client preferences for office chairs, the company planned to conduct market research. Three segments, known as SEG1, SEG 2, and SEG 3, were recently discovered by this market research endeavor. To conduct further marketing activities, the corporation must assess and choose the market sectors it purchases. The project team also consisted of two industrial engineers that work for the company, a marketing manager, a sales manager, and an R&D manager. The company should now evaluate the segments and select just one. There were several requirements, and each test was very difficult.

3. TOPSIS METHOD

The TOPSIS technique is a multi-objective decision-making process that can be used to answer questions with many objectives. This study recommends that foreign players who are introduced to CBA clubs be evaluated using the TOPSIS technique, which has had promising results. The TOPSIS approach was first developed by Yoon and Hwang in 1981 [3]. Its core principle is that the best option should be the one that is farthest from the worst-case scenario and closer to the ideal solution. Correlations between criteria, uncertainty in obtaining weights only through objective or subjective methods, and the possibility of simultaneously closing the best point and nadir point alternately are just a few of the problems with the traditional TOPSIS model that have been addressed. The geometric separation between each option and the best alternative—that is, the alternative with the greatest score on each criterion—is derived after a comparison of a number of alternatives and the normalization of the scores for each criterion. The geometric gap between each alternative and the ideal alternative—the alternative with the greatest score for each criterion—is calculated after a comparison of a number of alternatives and the normalization of the scores for each criterion. Normalization is usually required in multiscale scenarios because the scales' parameters frequently have the incorrect dimensions. [5][6] With the help of trade-offs between criteria offered by compensation techniques like TOPSIS, a poor decision on one criterion might be offset by a good decision on another. This provides a more accurate form of modeling than non-compensatory systems, which accept or reject other solutions based on tight cut-offs. The geometric separation between each option and the best alternative—that is, the alternative with the greatest score on each criterion—is derived after a comparison of a number of alternatives and the normalization of the scores for each criterion. Decision-making concerns are typically addressed with the TOPSIS technique. This approach focuses on contrasting all feasible responses to the problem. The application of the TOPSIS technique is demonstrated in the paper using two selected examples. In the first example, it is shown that the best TOPSIS solution is neither too close nor too far from the ideal solution. The TOPSIS strategy, which has the highest rating for each criterion, is frequently stated as follows: The fundamental rule is that the selected option should be closest to the ideal solution that is positive and farthest from the perfect solution that is ideal. Decision-making concerns are typically addressed with the TOPSIS technique. TOPSIS estimates the distance between the positive ideal solution and the negative ideal solution by determining the relative proximity to the positive ideal solution. The achieved order of preference determined by comparing relative distances [15] may be an option. This method is widely employed to complete decision-making. This is as a result of the notion. Application of the TOPSIS method theory to a new decision in a manner that is obvious, easy to understand, and accurate allows for improved hiring. Similar inconsistencies can be found in some earlier studies on adopting the TOPSIS technique. Examples [11] include selecting the best staff utilizing a web application and the TOPSIS technique. It is predicted that nothing new will be added to the body of earlier research.

4. RESULTS AND DISCUSSIONS

TABLE 1. Market Segment evaluation

	Segment factors	competition	technological factors	socio political factors	financial and economic factors
Degree of concentration	10.0000	5.5800	5.1500	6.1500	15.1500
Laws and government agency regulations	15.0500	6.1100	4.6300	15.0600	85.6500
Types of competitor	12.2300	6.0500	5.6400	15.7000	5.0500
Contribution margins	11.0200	5.1200	3.1500	15.0500	76.8500
Complexity	32.0500	8.1500	7.1500	5.1400	15.7500

Table 2 show the Data set of the Degree of concentration, Laws and government agency regulations, Types of competitor, Contribution margins, Complexity of the segment factor, competition, technological factors, socio political factors, financial and economic factors

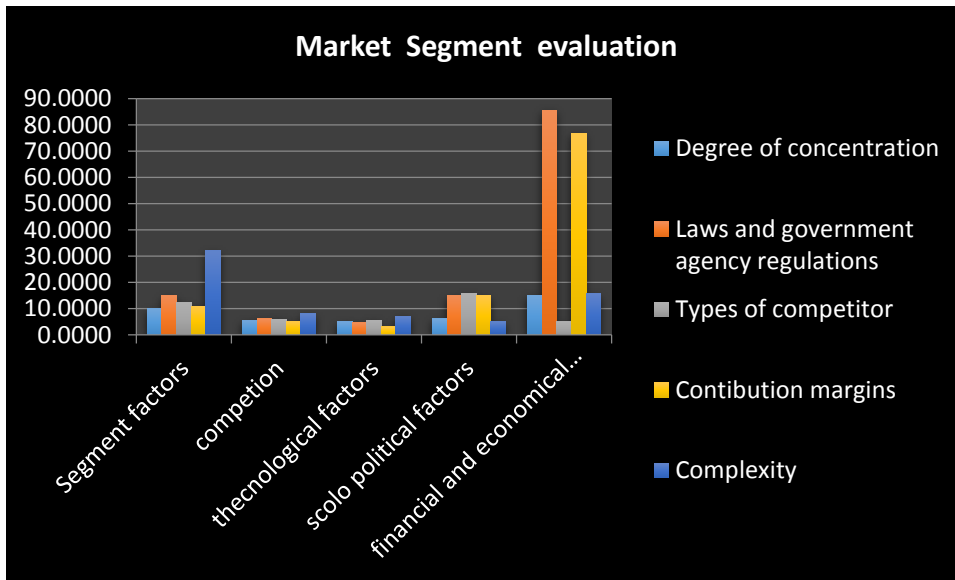


FIGURE 1. Market Segment evaluation

Figure 1 show the Data set of the Degree of concentration, Laws and government agency regulations, Types of competitor, Contribution margins, Complexity of the segment factor, competition, technological factors, sco political factors, financial and economical factors

$$X_{n1} = \frac{x_1}{\sqrt{(x_1)^2+(x_2)^2+(x_3)^2 \dots}} \text{----- (1)}$$

TABLE 2. Square Root of Value

	Segment factors	completion	technological factors	sco political factors	financial and economical factors
Degree of concentration	100.0000	31.1364	26.5225	37.8225	229.5225
Laws and government agency regulations	226.5025	37.3321	21.4369	226.8036	7335.9225
Types of competitor	149.5729	36.6025	31.8096	246.4900	25.5025
Contribution margins	121.4404	26.2144	9.9225	226.5025	5905.9225
Complexity	1027.2025	66.4225	51.1225	26.4196	248.0625

Table 4 shows the data from which the Square Root of Value is calculated from the data set value is divided by the sum of the square root of the column value following in formula 1.

$$X_{wnormal1} = X_{n1} \times w_1 \text{----- (2)}$$

TABLE 3. Normalized Data

	segment factors	competition	Technological factors	Sco political factors	Financial and economical factors
Degree of concentration	0.2481	0.3968	0.4340	0.2225	0.1292
Laws and government agency regulations	0.3734	0.4345	0.3902	0.5448	0.7306
Types of competitor	0.3034	0.4303	0.4753	0.5680	0.0431
Contribution margins	0.2734	0.3641	0.2655	0.5445	0.6555
Complexity	0.7951	0.5796	0.6025	0.1860	0.1343

Table 4 shows the data from which the normalized data is calculated from the data set value is divided by the sum of the square root of the column value following in formula 2.

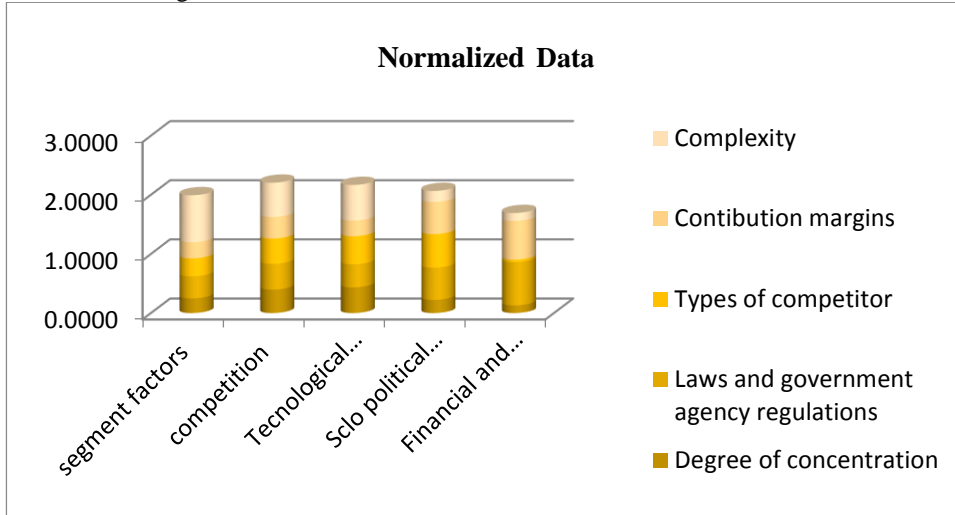


FIGURE 2. Normalized Data

Figure 2 shows the data from which the normalized data is calculated from the data set value is divided by the sum of the square root of the column value.

TABLE 4. Weightaged

Degree of concentra-tion	0.25	0.25	0.25	0.25
Laws and government agency regulations	0.25	0.25	0.25	0.25
Types of competitor	0.25	0.25	0.25	0.25
Contribution margins	0.25	0.25	0.25	0.25
Complexity	0.25	0.25	0.25	0.25

Table 3 shows the weight of the data set the weight is equal for all the value in the set of data in the table 1. The weight is multiplied with the previous table to get the next value.

TABLE 5. Weighted normalized decision matrix

Degree of concentration	0.0620	0.0992	0.1085	0.0556	0.0323
Laws and government agency regulations	0.0933	0.1086	0.0975	0.1362	0.1826
Types of competitor	0.0759	0.1076	0.1188	0.1420	0.0108
Contribution margins	0.0683	0.0910	0.0664	0.1361	0.1639
Complexity	0.1988	0.1449	0.1506	0.0465	0.0336

Table 3 shows weighted normalized decision matrix

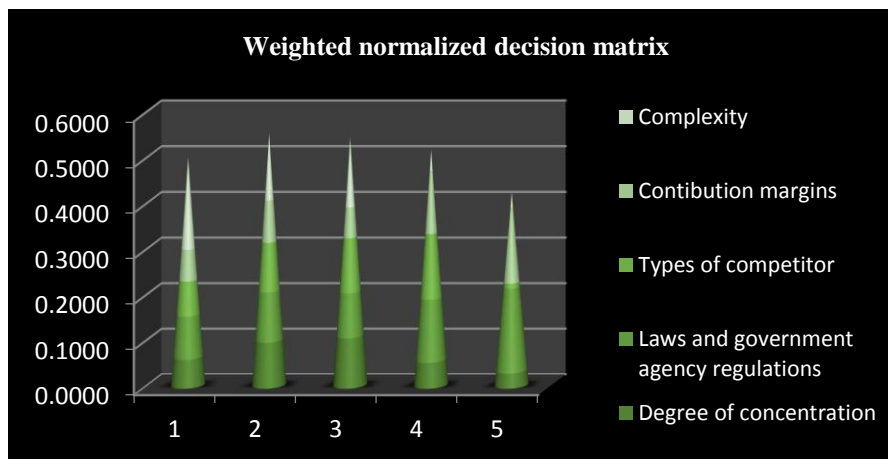


FIGURE 3. weighted normalized decision matrix

TABLE 6. Positive Matrix and Negatives matrix

	Positive Matrix					Negatives matrix				
Degree of concentration	0.1988	0.1449	0.1506	0.0465	0.0108	0.0620	0.0910	0.0664	0.1420	0.1826
Laws and government agency regulations	0.1988	0.1449	0.1506	0.0465	0.0108	0.0620	0.0910	0.0664	0.1420	0.1826
Types of competitor	0.1988	0.1449	0.1506	0.0465	0.0108	0.0620	0.0910	0.0664	0.1420	0.1826
Contribution margins	0.1988	0.1449	0.1506	0.0465	0.0108	0.0620	0.0910	0.0664	0.1420	0.1826
Complexity	0.1988	0.1449	0.1506	0.0465	0.0108	0.0620	0.0910	0.0664	0.1420	0.1826

Table 6 shows Positive and Negative Matrix for degrees of concentration, laws and government agency ,types of competitor, contribution margins, complexity In various Positive Matrix in Maximum value 0.1988,0.1449,0.1506 Minimum value 0.0108,0.0465 is taken and for Negative matrix the Minimum value 0.0620,0.0910,0.0664 maximum value 0.1420,0.1826 is taken

TABLE 6. SI Plus, Si Negative, Ci and Rank

DATA SET	SI Plus	Si Negative	Ci	Rank
Degree of concentration	0.1520	0.1786	0.5402	2
laws and government agency regulations	0.2299	0.0479	0.1725	4
Types of competitor	0.1632	0.1810	0.5258	3
Contibution margins	0.2419	0.0207	0.0787	5
Complexity	0.0228	0.2450	0.9148	1

Table 7 show the sum of the calculation positive and negative matrix, the Si plus is calculated from the positive matrix, Si negative is calculated from the negative matrix and the Ci is calculated from the sum of the Si plus and Si negative. Table 6 shows the Complexity is on 1st rank, Degree of concentration is on 2rd rank, Types of competitor is on 3rd rank, laws and government agency regulations is on 4th rank, Contibution margins is on 5th rank.

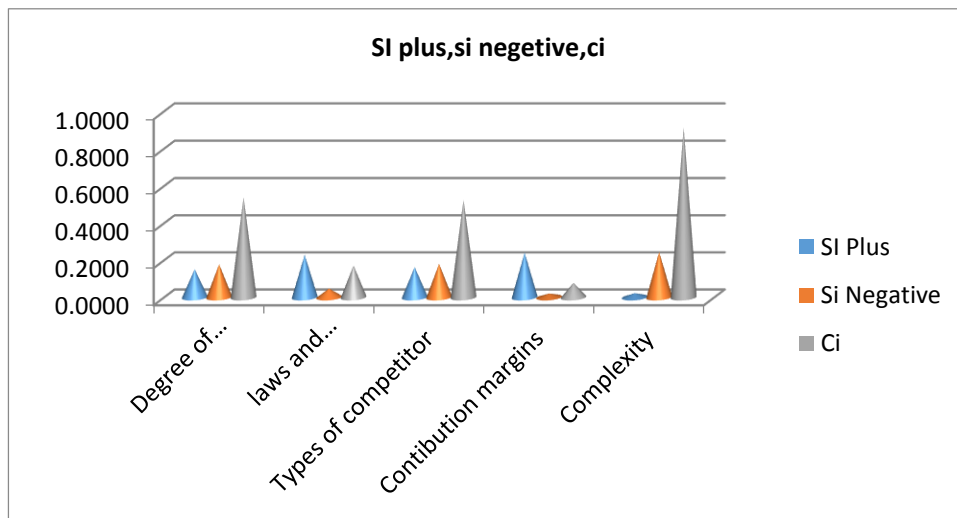


FIGURE 4. SI Plus, Si Negative and Ci

Figure 4 show the sum of the calculation positive and negative matrix, the Si plus is calculated from the positive matrix, Si negative is calculated from the negative matrix and the Ci is calculated from the sum of the Si plus and Si negative.

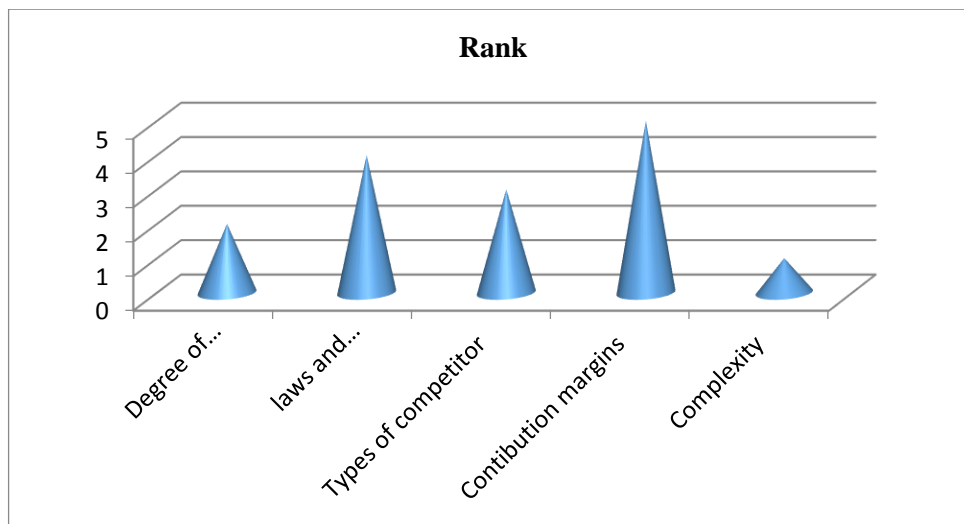


FIGURE 5. Ranking

Figure 5 shows the Complexity is on 1st rank, Degree of concentration is on 2nd rank, Types of competitor is on 3rd rank, laws and government agency regulations is on 4th rank, and Contribution margins is on 5th rank.

5. CONCLUSION

Because of the increasingly competitive industry, businesses must choose wisely when it comes to marketing issues. One of the most important difficulties is the evaluation and choice of market segmentation. Selecting and analyzing market segments is an essential managerial marketing responsibility for all firms. It assists a business in determining which target segment or segments to target in order to focus its competitive advantages, assets, opportunities, and marketing strategies on successfully satisfying customer needs and wants. In this study, a hybrid MCDM approach based on the TOPSIS method was created for selecting the optimal market segment. This application has demonstrated how well the model can be used for segment evaluation and selection. The model proposed in this study is specifically applicable to the assessment and selection of market segments, but it can also be used, with slight modifications, in the decision-making process.

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