

Application of “PROMETHEE” for Market Targeting: A Case Study on the TV Market in Iran

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A decision for selection of a target market is one of the most important issues in strategic marketing. To tackle this issue, an appropriate segmentation of the “available market”, as well as the determination of market attractiveness criteria, are defined in the marketing process. Therefore, determining the best position in the market can be decided through the process of segmenting, targeting and positioning analysis. By using the market attractiveness criteria market targeting can be supported by multi-criteria decision-making methods. The objective of this research is to introduce the application of PROMETHEE as a multi-criteria decision making approach for ranking preferential alternatives and for determining the best target market. The proposed approach is examined in a case study on the TV market in Iran. To do this, the ideas of consultants, specialists and experts in the TV market, as well as existing research and statistical analyses on the TV market, have been gathered to determine market attractiveness criteria, in order to evaluate possible alternatives in the target market. Then, the Preference Ranking Organization Method for Enrichment Evaluations (PROMETHEE), which is one of the most efficient methods for solving the problems of multi attribute decision-making, has been used, in order to rank alternatives and to determine the target market. This paper focuses on the application of PROMETHEE in determining the target market, which also supports the marketers in their decision for optimum allocation of organizational resources to the marketing mix. A bridge from an important problem area in marketing management to a quantitative approach for solving the problem, using a multi-criteria decision making method, is the main contribution of this research to the area of marketing science.

INTRODUCTION

Marketing is a phenomenon in close relation to people’s daily life. Everybody sells his/her own products, services, beliefs and ideas everyday and, on the other hand, buys those of others to fulfill his/her daily demands. Marketing is not the art of selling products; but is an accurate knowledge of the products to be produced for fulfilling people’s demands. This definition, at its best, allocates the relatively limited resources of the organizations to fulfill an unlimited number of demands [1,2].

Companies sometimes believe that “Marketing” is just “Selling” and “Promotion”; but, intelligent

and experienced managers know perfectly well that only applying different methods of marketing, in itself, will not fulfill demand under today’s complicated and varied market conditions. Regarding the complicated condition of today’s market, selling plays a small role in “Marketing” and marketing is no longer the mere and astute application of selling a product. Marketing is no longer selling products and services, but, is the art of planning for the production of services and/or products, which will increase customer satisfaction and fulfill his/her demands [1,2].

Experts define marketing as the process of fulfilling human demand; Philip Kotler[2] defines marketing as: “A human activity done through a transaction process for fulfilling demand [1,2].

It is necessary to mention that the concept of marketing is often confused with that of selling. The concept of selling, starting from the factory, looks from inside to outside, focuses on the existing products

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and goods of the company and seeks more selling and profitability. The concept of marketing, however, looks from the outside to the inside. This concept starts from a fully defined market, focuses on the demands of the customer and coordinates the marketing activity in such a way as to generate profit through fulfilling customer demand [1,2].

MARKETING MANAGEMENT PROCESS

Generally, the marketing management process consists of the following steps [1,2]:

1. Analyzing market opportunity and threat,
2. Determining the target market,
3. Designing the marketing mix,
4. Managing market attempts.

Regarding the fact that “Determining the target market” is the most important step in this process, it will be the focus of this paper.

Today’s market situation shows clearly that companies are not able to fulfill all customer demands or, at least it is not possible to satisfy all customers. There are always different customers with a variety of demands. So, each company, has an opportunity to serve a specific segment of the market. Each company, first of all, should analyze the market situation and, then, select the segment that it can serve better than its rivals [1-5].

Selection of the target customer, through projecting market demand in different segments and the targeting the appropriate market segment, are the main activities of the marketing management decision making process [1,3,4,6,7].

In 2003, Philip Kotler defined market segmentation as: Dividing a market into small segments or separate subsets distinguishable from customers, in such a way that selecting these subsets leads to target market determination with a distinct marketing mix.... The process of customer classification, according to the groups’ specific behaviors, specifications and demands, is called market segmentation” [1].

In other words, market segmentation paves the way for identifying and targeting small homogeneous markets and aims to identify those segments of the market that have more interest in a specific product or service. This will create the most effective marketing attempts [3,5,7].

Finding the best criteria for market segmentation is an important issue in market segmentation. Customers can be classified according to different factors, such as the following [1,3,5,7]:

- Geographical factors (country, region),

- Demographical factors (gender, age, income level, education level),
- Psychological factors (social class, life style, individual and social behavior),
- Behavioral factors (consumption rate, purchase and buying behavior).

Market targeting and finding a suitable position in the market is one of the strategic decisions in marketing management [5,7,8]. To do this, market attractiveness criteria are determined on the basis of the specifications of the product and/or service, as well as other conditions of the companies, in the competitive market environment. Ranking the market segments, in order to target the best suitable position in the market for each product or service of a company, can be done by using quantitative approaches in the multi-criteria decision-making process.

The problem of determining the target market, as one of the important steps of strategic decision-making, in the marketing process, by selecting the best alternative from among all segments of the market, can be tackled by classification and ranking methods, which are included in multi-criteria decision-making processes. Also, with regard to the strong and widespread effect of target market characteristics on other marketing management activities, e.g., designing the marketing mix and managing the market attempts, determination of the target market plays a key strategic role in marketing management.

A classic approach to the decision-making theory assumes that the ranking of potential target markets by marketing managers requires specifying relative evaluation indices and decision making variables, along with the importance degree of each index. Therefore, the required information for different segments of the market, as well as for information related to the intended indices, is collected and, finally, one or several superior indices are applied to specify the best alternative for the target market.

TREND OF DECISION MAKING MODELS IN MARKETING LITERATURE

According to Leeflang and Wittink [9-11], the trend of decision making models in marketing can be divided into two eras.

1. Before 1985:

The beginning of this era was characterized by the direct application of existing Operations Research (OR) and Management Science (MS) methods to marketing problems. This period (around the years 1950-1965) was defined primarily by the transposition of OR/MS methods into a marketing framework. OR and MS largely emerged during and

after World War II, with algorithms and processes applicable to production and logistics. Successes in those areas encouraged researchers in the early 1960s to solve problems in other areas, such as finance and marketing [11].

From the feedback of the latter period, researchers felt that lack of realism was the principal reason for the dearth of implementation of the early marketing models. So, the middle years of this era (around the years 1965-1970) are characterized by the adaptation of models to fit marketing problems. These larger and more complete models captured better marketplace reality. The resulting models were more representative of reality, but, often lacked simplicity and usability. In this period, different descriptive models of marketing decision-making developed [12].

In the period of implementable models, there was an increased emphasis on models that were acceptable representations of reality and that were easy to use, which formed the model in the last years of the era before 1985 (around the years 1970-1985). In this period, the focus shifted from "isolated" decision problems to implementation and implementability. Pioneering work on the implementation issue is provided by Little [13] on the concept of a decision calculus.

2. 1985 and after:

In the second era, models were increasingly implemented with an interest in marketing decision support systems. In this era, one can also see an increase in different model applications that resulted in meta-analyses and studies of the generalizability of results. The present era represents a level of maturity in model building for marketing decisions [11]. This maturity is reflected in the following aspects:

- a. Some models have been applied many times in a somewhat standardized form. Wide applicability of a given model would not be possible without the availability of detailed data sets for many products, including access to the appropriate software and estimation methods and sophistication on the part of both the model builder and the model user [11];
- b. There is recognition of opportunities for the model-based automation of market decisions, such as market targeting. Although the applicability of some marketing models to real-world problems has been doubted [14], it is clear that there are many examples of successful applications [15-17];
- c. The publication of empirical studies, completed by different researchers who used different models and different data sets, has facilitated the

examination of similarities and differences between substantive findings. This has led to Meta analyses and empirical generalizations;

- d. Existing models developed in one context are applied and adopted, if necessary, to new contexts [18,19] (such as the case in this paper, with PROMETHEE and market targeting).

In this paper, after carrying out a case study on the TV market in Iran, the authors suggest the application of multi-criteria decision making to determine the target market of one of the TV manufacturing companies in the country. Determining the target market, besides determining the end customers, directs the efforts of different parts of the organization towards a specific goal and organizes all the capabilities and resources of the company towards dominating the specified segment of the market. Therefore, tactful targeting in the market will prevent the wasting of the organization's energy and resources and increases the effectiveness of the marketing management process. So, the main contribution of this paper is the application for the first time, to market targeting, of a multi-criteria decision making model, PROMETHEE, which follows the same trend of maturity in model building already traced in the literature [18,19] for marketing decisions.

CASE STUDY: THE TV MARKET

First of all, it has to be mentioned that, given the widespread TV consumer market, the total delimitation and macro segmentation of the market play a major role in accurate determination of the ideas put by consultants and managers in the intended study. Based on their ideas and regarding the high variety of the products (despite a small difference between different varieties) and widespread places where TV is used, the TV market can be divided into four main groups, as follows [20,21]:

1. Household consumer market (education, entertainment, news, amusement),
2. Stores consumer market (education, amusement, news, leisure times),
3. Organizations and companies consumer markets (education, news, entertainment, etc. in company offices, conference halls, managers' offices),
4. Public places consumer markets (education, entertainment etc. in institutes, exhibitions, local advertisements, schools, hospitals, mosques, trains, buses, terminals, hotels, etc).

Given the large number of people using TV, the widespread use of TV in houses will be studied in this research.

In order to implement accurate consumer market segmentation, by the ranking and targeting (determining attractiveness criteria) of the market, first, the potential household consumption market, as well as the penetrated household consumption market, will be estimated and analyzed.

The term “potential market” refers to a set of consumers who are, in a way, interested in the intended goods or services. Given the distinctive and varied characteristics and the specific value of TV among consumers, one can accurately call all the consumers of TV in Iran the potential market of this product. In other words, all consumers are willing to use TV and, in fact, the number of those who are against using it is almost negligible [20,21].

However, “Penetrated market” is comprised of consumers who, for the time being, have already bought TV sets. Also, given the needs and interests of people, along with the competitive conditions governing the TV market, a considerable capacity of this market should be penetrated by domestic TV manufacturing companies. As a matter of fact, the main portion of this market has been taken over by imported brands in recent years, because of the following reasons: The non-responsiveness of the managers of the local manufacturing companies to market competition; outdated methods of marketing and management; inappropriate sales and distribution networks and relative customer dissatisfaction with local products compared to other brands. The research undertaken in Tehran by the IRIB (Iran Broadcasting Organization) in 2001 shows that the penetrated capacity for the TV market is about 1.2 per family (in Tehran). This figure includes the penetrated capacity for the TV market of the second and third TVs existing at home. There is another conclusion for this research. If one considers all the rooms of a house (guest room, living room, kitchen, etc.) as a potential TV market, the unpenetrated potential market will be almost three times the penetrated market. It is clear that this unpenetrated market includes “would be married groups” and “groups replacing TVs” and “groups purchasing more TVs” etc. [20,21].

SEGMENTATION OF THE HOUSEHOLD TV MARKET

The Market segmentation process, in its extremist form, considers each customer with his/her specific needs and demands and provides each customer with a separate marketing plan (one to one marketing). But, such an intensive marketing plan is not always economical. So, marketing, for many products, like TV sets, is seeking for groups of customers with different attributes of buying behavior at the time of purchasing.

The household TV consumer market has differ-

ent attributes as criteria for delimiting the intended market. Given the fact that there is not one common approach for segmenting the different products and services market, it is necessary for a marketer, seeking an optimum method or criterion, to study market segmentation variables separately or all together. In many approaches to market segmentation, different factors, including, geographical and demographical factors (such as age, gender, life style, education level, job, income level, social class etc.) are used as criteria for delimiting the market. Given the fact that TV is in the durable household furniture basket (with an average life span of 7 to 20 years), its purchasing pattern depends on the family, not an individual member and, also, given the considerable price of this product, based on the results of brainstorming meetings, as well as analyzing opinions forwarded by consultants and managers of the intended company, family income level is considered the base criterion for segmenting the household TV consumer market. So, regarding the social and economic conditions of Iran, the price range of a TV set and the opinion forwarded by marketing experts and consultants of the TV company, the TV consumption market in houses is segmented into the following five groups [20,21]:

- Group 1: Families with a monthly income less than 100,000 tomans,
- Group 2: Families with a monthly income between 100,000 and 150,000 tomans,
- Group 3: Families with a monthly income between 150,000 and 200,000 tomans,
- Group 4: Families with a monthly income between 200,000 and 500,000 tomans,
- Group 5: Families with a monthly income more than 500,000.

MARKET ATTRACTIVENESS CRITERIA

The comprehensive target marketing and positioning of the TV consumer market, namely; ranking different segments of the market and determining the target market, require both market segmentation and precise determination of the market attractiveness criteria, according to the market condition and specific conditions of the intended company. Also, it is necessary to determine the priority ratio of these attractiveness criteria. Experts in the brainstorming sessions have undertaken the analysis using methods similar to Delphi and, also, through the opinion of consultants or experts in the field. The results have also been enriched using the analysis of existing documents related to research and statistical analyses. To do this, more than 25 hours of brainstorming sessions have been held in the presence of the sales and marketing managers

and consultants of the TV manufacturing company. (The case study was undertaken in the biggest TV manufacturing company in Iran.) In these sessions, at first, the 18 participants proposed a number of attractiveness criteria, without any limitation, which were discussed one by one. Then, the priority ratio of each attractiveness criterion was determined through discussions on the structural characteristics of each criterion and the data gathered on the internal and environmental conditions of the intended TV markets, as well as the findings of the existing research and statistical analyses.

The results of the attractiveness criteria for the issue presented in this paper, as well as the priority ratio for each criterion, which is considered to be between 1 to 10, are, as follows:

1. The intended segment volume (priority ratio: 10): This criterion, which is the major criterion for decision-making and selection of the best segment in the market, is the estimation of the existing family volumes (members) of each segment in (the potential market);
2. The intended company's referring expenses should be proportionate to the related segment (priority ratio: 9): Given the various expenses, such as for selecting each segment of the TV consumption market (distribution, promotion, discount, etc.), the appropriateness of these expenses will play an important role in selecting the target segment;
3. The low influence of direct rivals over the related segment (priority ratio: 9): Given the intense competition in the TV consumption market, the influence of the direct rivals of the intended company over different segments of the market will play an important role in ranking market segments;
4. Cash purchasing (priority ratio: 8): The above-mentioned factor will have an influence over selection of the target market, due to the importance of the cash transaction and its benefit to the company's liquidity;
5. The segment's low sensitivity to the negative aspects of the intended company's product (priority ratio: 8): Regarding the customer viewpoint on the undesirable product specifications (quality, trade mark, etc.) of the intended company's products, the market segment's lack of sensitivity to these aspects is influential in selecting the target market;
6. The level of loyalty to the company of customers in the related segment (priority ratio: 7): The level of customer brand loyalty, in the long run, will have a great influence over selecting the best segment in the market;
7. The TV's high daily consumption rate (average consumption time) (priority ratio: 7): Regarding the great influence of this factor on "supply" and "demand", this factor plays a major role in the ranking of different segments;
8. The level of influence of the sales agents on purchasing decision-making (priority ratio: 7): Given the fact that the desirability of selling the products of the intended company is not considerable in the minds of the sales agents and TV distribution network in comparison to of imported brands, "the level of effectiveness of the sales agents over purchasing decision-making" has little influence on the target market selection;
9. The effect of promotion on the related segment (priority ratio: 6): Considerable promotion (especially TV promotion) by the intended company will have a great influence on ranking different segments of the market;
10. High inclination for replacement in the intended segment (priority ratio: 5): Given the fact that willingness to replace an old TV set with a new one is one of the key reasons for purchasing a TV, the said factor plays a role in ranking and prioritizing different segments of the market.

DETERMINING THE TARGET MARKET

The PROMETHEE method, as a MADM technique, is based on deviation of the alternatives' evaluation compared to different criteria [18,19,22]. Here, the multi-criteria preference value for each alternative, compared to other alternatives, is calculated and, then, the rank of each alternative, compared to the others, is defined. Therefore, with regard to the segmentation of the household TV consumer market and the defined criteria for market attractiveness, it is possible to target the market and find a suitable position in the competitive market. This is done through making use of the results of research, studies, statistical analyses, official statistics, the viewpoints of experts and consultants in brainstorming sessions and, finally, through the required assessment of each market segment in proportion to the attractiveness criteria (Tables 1 and 2).

The graphs of the partial and full ranking (PROMETHEE I & II), as well as the true rate of net outranking stratification (ϕ) related to the five intended alternatives (segmentations of the TV consumption market in houses), have been presented below (Figures 1 and 2).

Table 1. Attractiveness criteria.

	Criterion 1	Criterion 2	Criterion 3	Criterion 4	Criterion 5	Criterion 6	Criterion 7	Criterion 8	Criterion 9	Criterion 10
Min/Max	Maximize	Maximize	Minimize	Maximize	Minimize	Maximize	Minimize	Maximize	Minimize	Maximize
Weight	10	9	9	8	8	7	7	7	6	5
Preference Function	Gaussian	Level	Level	Level	Level	Level	Gaussian	Level	Level	Level
Average Performance	177	4.2	2.6	3.8	2.4	3.2	10.373	3.6	2.8	3.8
Standard Dev.	92	0.8367	1.1402	1.3038	1.1402	1.3038	1.369	1.1402	1.4832	0.8367
Unit	Family	5-point	5-point	5-point	5-point	5-point	Hour	5-point	5-point	5-point

Table 2. Evaluation table.

	Criterion 1	Criterion 2	Criterion 3	Criterion 4	Criterion 5	Criterion 6	Criterion 7	Criterion 8	Criterion 9	Criterion 10
Action 1 (Group 1)	32	Average	Very little	Bad	Very little	Very much	10.056	Little	Very little	Very much
Action 2 (Group 2)	26	Good	Average	Average	Little	Much	11.589	Very much	Little	Much
Action 3 (Group 3)	22	Very good	Average	Good	Little	Average	9.126	Average	Average	Average
Action 4 (Group 4)	16	Very good	Little	Very good	Average	Little	12.013	Much	Average	Average
Action 5 (Group 5)	4	Good	Much	Very good	Much	Little	9.081	Much	Very much	Much

In Figure 3 (GAIA diagram), Criteria 1, 7 and 8 (due to the fact that the γ axis is longer) have more distinction capacity than alternatives. Also, Criteria 1, 3, 5 and 6 have similar functions, since the direction of their axes is almost the same. But, criteria 3 and 9, 2 and 10 and 4 and 3 are negative, since their axes are against each other. Also, Criteria 5 and 7 are independent of each other because their axes are nearly orthogonal.

The important point in the GAIA model is the degree of conformity between the displayed data and the model behavior in a practical situation, which is shown by S . In this case, this parameter is equal to 87.25%, which means that the GAIA model includes 87.25% of the practical situation's data. This shows the credibility of the represented data.

Another important point in using PROMETHEE for selecting the preferable alternative is the possibility of the sensitivity analysis of decision-making in proportion to the decision-making attractiveness criteria [18,19,22]. This is done through a tool called

Walking Weights in Decision Lab software [18,19,22]. Here, the sensitivity of decision-making has been analyzed dynamically and in proportion to the importance weight for each of the criterion. This is done in such a way that, by decreasing or increasing the importance weight of each criterion in proportion to other criteria, the change in the net outranking flow will be observable. For example, in the issue discussed in this paper, the decrease in the importance weight of Criteria 1, 3, 5, 6, 8 and 10 results in fundamental change in ranking of the alternatives and the order of the suggested alternatives (the ranking results change to Group 4, Group 2, Group 3, Group 1 and Group 5).

By using the sensitivity analyzing tool (walking weight), it is observed that the decrease in the importance weight of other criteria up to 50% does not change the ranking of the alternative (Figure 4). This point is a sign of the considerable validity of the decision made (importance weight of the criteria and evaluation of the alternatives). The possibility of a sensitivity analysis is one of the most important

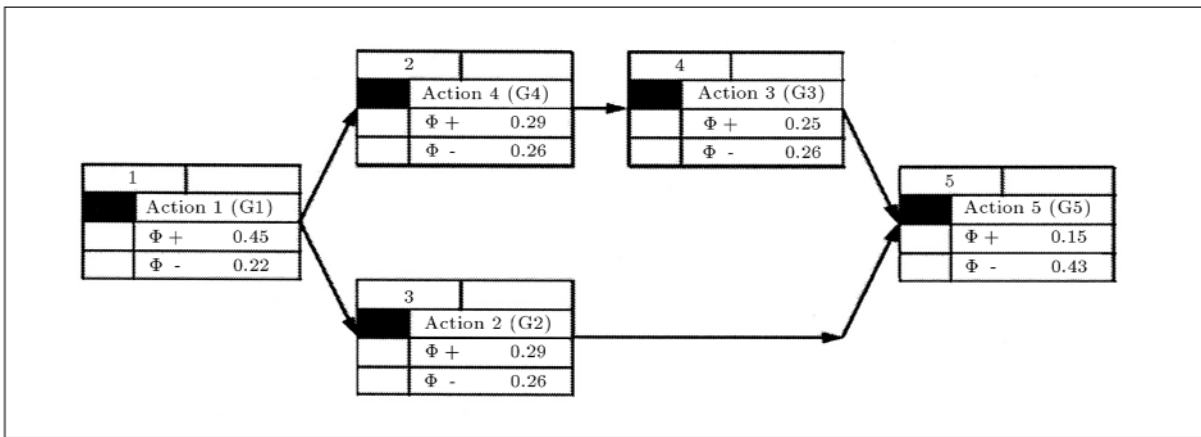


Figure 1. PROMETHEE I partial ranking.

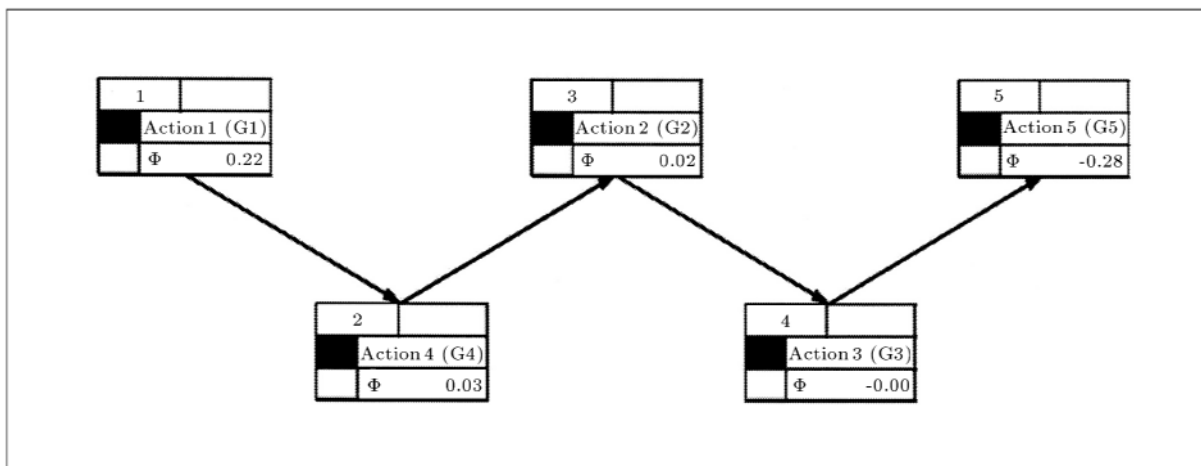


Figure 2. PROMETHEE II full ranking.

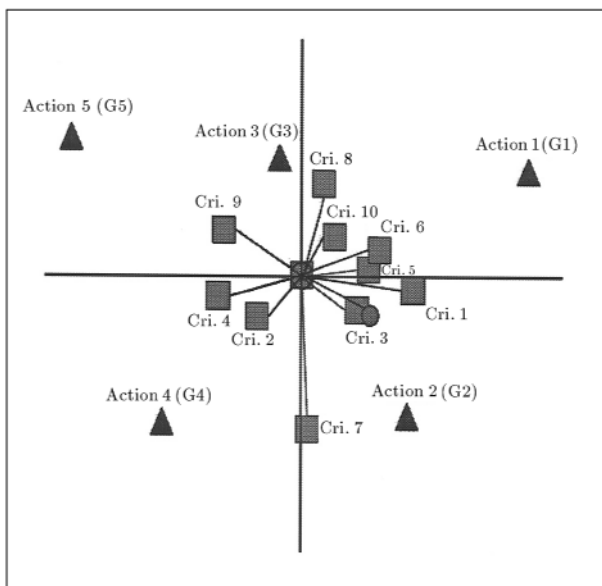


Figure 3. GAIA display.

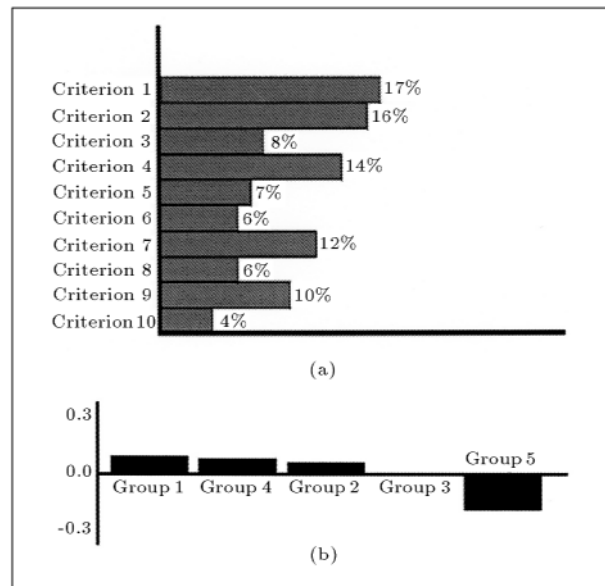


Figure 4. Walking weight.

advantages of the application of the PROMETHEE method in market targeting and helps decision-makers to evaluate the attractiveness criteria and importance weight for each of them in a more flexible way (see Figure 4).

In the GAIA outcome all alternatives and criteria are shown, along with the decision axis (ϕ). Since alternatives 3 and 5 are not in the direction of the decision axis, alternatives 1, 2 and 4, which are in the direction of the decision axis, are suggested. According to this method, the ranking of the suggested alternatives as target market segments are, as follows:

1. Group 1,
2. Group 4,
3. Group 2,
4. Group 3,
5. Group 5.

Therefore, a differentiated marketing strategy in market targeting will be based on the above-mentioned ranking.

As in any study, the limitations of this case study have influenced the findings. The most important limitations were with regard to the limitation in gathering data, due to the lack of an efficient information system and, also, limitations in publishing the confidential information of the TV market of the intended company. The limitations of the PROMETHEE model, due to the subjective nature of multi criteria decision-making, could be remedied by the use of a sensitivity analysis. In the implementation aspect of the above-mentioned model in the marketing activities of the intended TV manufacturing company, the organizational issues of their marketing department were paramount.

CONCLUSION

The application of the "PROMETHEE" decision aid model in determining the target market is an effective and efficient process [20-22]. This research contributes to making a connection between marketing management and engineering methods. In addition to providing a strong tool for marketers for interpreting results and analyzing the sensitivity of their decision, "PROMETHEE" creates a relative balance between the accuracy and rapidity of decision-making. The findings of the case study in this article increased the awareness of the intended company of its market condition and encouraged them to abandon the old outlook to market targeting.

In this method, first of all, the amplitude of deviation in the alternatives evaluations is calculated. Second, for each pair of the alternatives, the overall degree of preference of each alternative over the others

has been calculated and, finally, the alternatives are fully ranked. One of the most important advantages of implementing this method in the intended TV manufacturing company could be in the possibility of utilizing the alternative preference rate in planning for allocating organizational resources to the marketing mix, so that, by implementing this decision aid model, the tangible and intangible organizational resources will be allocated to the marketing mix in such a manner that will result in the best efficiency.

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