International Journal of Applied Optimization Studies
Year 2019 Volume 03 Issue 01 pp. 73-89.
www.ijaos.com

Effective Factors in Network Marketing Success and Ranking Using Multi-criteria Decision Making Techniques

Mohammadreza Montazerolghaem
Department of Industrial Engineering, Technical College, Naghshe-Jahan University, Isfahan, Iran

Abstract

Network marketing is one of the most effective ways for people who want to be their own employer. But there were problems in this way, especially in our country. The most important problem was the creation of pyramid firms. But over time and gradually, network marketing managed to find its market in Iran and encourage a relatively large number of people to this area. There are many factors in the success or failure of effective network marketing, which we tried to identify the most important of these factors in the present study. In the next step, using the AHP technique, we will rank these factors, categorize and prioritize the main criteria. In addition to the AHP technique, Topsis technique was used to prioritize the same option. The results obtained from this study can serve as a source and reference for organizations and companies that want to pursue network marketing work.

Original Article:

Received 2020-01-29
Revised 2020-04-30
Accept 2020-05-05

Keywords:
Network Marketing;
Analytical Hierarchy process;
Multi-Criteria Decision Making.

1. Introduction

About 8 years ago, network marketing was officially launched in Iran, and there have been widespread changes since then. In Iran, however, this issue has been faced a serious challenge, and the main reason is its background as a pyramid network in the community, and today, apart from those who have familiarity with network marketing, the rest of the people do not notice any difference or distinction between network marketing and pyramid networks, which has led to the isolation and remoteness of this art and technology in Iran. However, over time, there were companies that were able to get official permission from the Ministry of Industry, Mines and Trade. The reason for choosing this issue was its novelty and no one in Iran has ranked the success factors through multi-criteria decision making so far. Moreover, the results obtained from this study are a good basis for all companies using this system, so it can be considered as another reason for choosing this topic. The question is, what are the factors that affect network marketing success? How to rank and prioritize these factors using multi-criteria decision-making techniques? These are the main questions in this project, which are discussed in detail in the following sections. This research is vital because it can be used as a reference by itself. In fact, all the reasons for success

in network marketing are determined and ranked in the next step. These results will guide the people who are going to work in this area to know what factors must be followed and how much attentions is needed for these factors and what factors must be avoided. . In general, it indicates the necessity of using network marketing in comparison with other marketing techniques. The following aims in the present study are:

- Identifying the effective factors in network marketing success.
- Prioritize the effective factors in marketing success, based on the multi-criteria decision-making techniques.
  - Prioritize the effective factors in network marketing success, based on the AHP method
- Comparing the results of the two mentioned methods.

2. Theoretical fundamentals of the research

2.1. Marketing

Manufacturer's needs and products should be determined just by consumers' needs to meet those needs.

Marketing is a social-managerial process, by which individuals and groups can meet their needs through the production and exchange of value.

Marketing is based on the following principles (Šramová, 2015):

- The goal of any business is to have a customer and maintain it.
- The customer is the base of every business and leads to its survival.
- Marketing is not the only the wider activity in comparison with sales, but also, it involves a whole business.
- Trade means marketing and marketing means trade.

2.2. Network Marketing

It is a kind of marketing and sales that takes place without an intermediary, i.e., each person as well as selling his products, can take people as subcategories and use their profits in his sales. The differences between traditional and network marketing are shown in Figure 1.

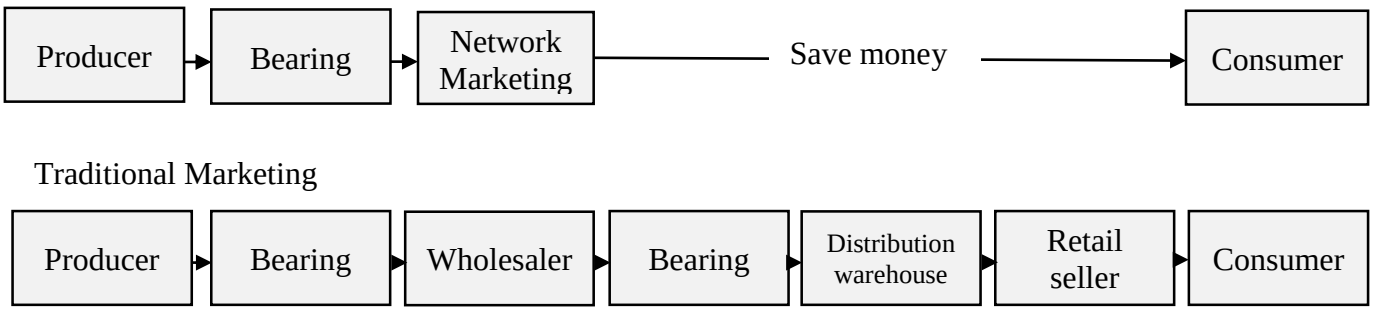


Fig. 1. Comparing traditional marketing with network marketing

2.3. Decision making

Predicting, evaluating and comparing the results and available solutions, the definitive selection of a solution to achieve a desired goal is called decision making (Fadil, 2015).

2.4. Multi-Criteria decision making

The criterion is called the principle which involves its goal and constructor in which, the decision maker takes them into account in order to increase his desirability and satisfaction. Criteria are, in fact, the target stone or its measuring instrument (Fadil, 2015).

If different qualitative and conflicting factors are evaluated in decision making, and a suitable solution is chosen among several options, this kind of decision will call multi-criteria decision making (Klein et al., 2015).

3. Background research

Here are some examples of researches which have been done in this regard:

It has been stated that the body of man is the oldest handwritten by God, you have not chosen to have two or two eyes or one mouth. Your parents did not give any comment on how to design your body. If you look at your body, you often see the parts in pairs. Tongue is a single member of your mouth, where you can express that great meaning. A person who speaks must see, hear, think, focus, and uses twice. Everyone is the victim of his/her own tongue, a part which is not calm. We rarely think before talking. "We even talk in our dreams." There are two barriers to hear from your inner part. First, the sounds which are created by ourselves and the second is the sounds of the outside world. The silence territory shuts off the source of the first sounds which belong to you. Do not listen to others while you're hearing your inner part sound. There are so many sounds inside and outside of you. The silence territory is the tranquility for the only and most active parts of the body, the tongue. First, turn it off and then sound off the world. Find out each one of your voices, and tell yourself you must not hear it. If the word is stronger than the sword, then every word must be valuable to say. It was an introduction of this book which states that humans has no choice in some areas, but conclusion part of this book suggests that self-knowledge is the most important element of a human being, then, in this self-knowledge, man can recognize his ability. Now, it's better to use this talent and ability in the achievement of his desires. So, here, human has the right to choose and it is necessary to make his most important decision. Specifically, network marketing is also a special case where people can choose it in order to have their own choices and use them in their personal purposes (Lee and Walsh, 2011).

This article discusses impact on others and mostly considers network marketing and its impact as one of the most important factors. In this regard, one can see a very interesting example in the following part (Airas, 2015):

A bunch of monkeys on the beaches of Japan have been investigated. One day, one of those monkeys from this category, washes his potatoes in a special way in the sea and repeated that in the following days. Not long after the rest of the monkeys imitated his work. After that, a certain number of monkeys behaved in this manner, another group of monkeys which were hundreds of miles far away with no connection with the first group, showed that behavior. According to this

theory, if a particular thought or action becomes common among a certain number of a race or species, this thought or action will be revealed by other members of that race or species in other areas even with having no connection together. This experiment had important results and showed that, when the new level of consciousness is created among a number of individuals and change their behavior significantly, awareness will be transmitted to other people with no contact. Certainly, if we begin to think in a coordinated and non-violent manner and increase in our numbers in a desired way in this regard, we can thus be able to market the company! "The struggle will end in the world for ever. We will raise ourselves and contribute by expanding this work by informing more people.

This article is done to present we talk about communicating with individuals and using these techniques in network marketing, and believes that the ability to communicate with individuals is the most important element in network marketing , therefore, individuals can succeed in this area (Hawks, 2005).

There are, of course, other issues regarding network marketing, but with regard to the limitations of writing, we will list all of these resources at the end of the article.

3.1. Compare with previous researches

In previous network research, only indicators of motivation, psychological issues of members, support and commitment of members, development of individual ability, and attention to human resources are presented in a limited scope and with statistical assumptions tests, which is a very small aspect of the network marketing system structure. On the contrary, in this research, all the effective factors in the needs of distributors are covered with maximum comprehensiveness Also, a questionnaire can be used as a measurement for assessing the distributor's needs in the industry.

4. Methodology

This research is descriptive in terms of the research question, field and theoretical in terms of data collection, quantitative and qualitative in terms of nature of data and finally is practically based on the purpose of study, and is investigating the factors in network marketing success globally and specifically in Iran. To collect material related to the literature review, the library method, the study of books, articles, the speeches of outstanding professors in this field, master's theses and Ph.D. dissertation have been used and to collect the data, a questionnaire has been used. So this research is generally done in five step as shown in Figure 2.

- The first step is identifying and exploring the effective factors in the network marketing success.
- The second step, according to the required information, a questionnaire administrated and gave to the general public and experts. Then the obtained information is collected and finally, according to the first step, this obtained information is classified.
- The third step is ranking these factors using multi-criteria decision-making techniques.
- The fourth step is comparing the results of the two methods of AHP and TOPSIS.
- The fifth step is the discussion and conclusion.

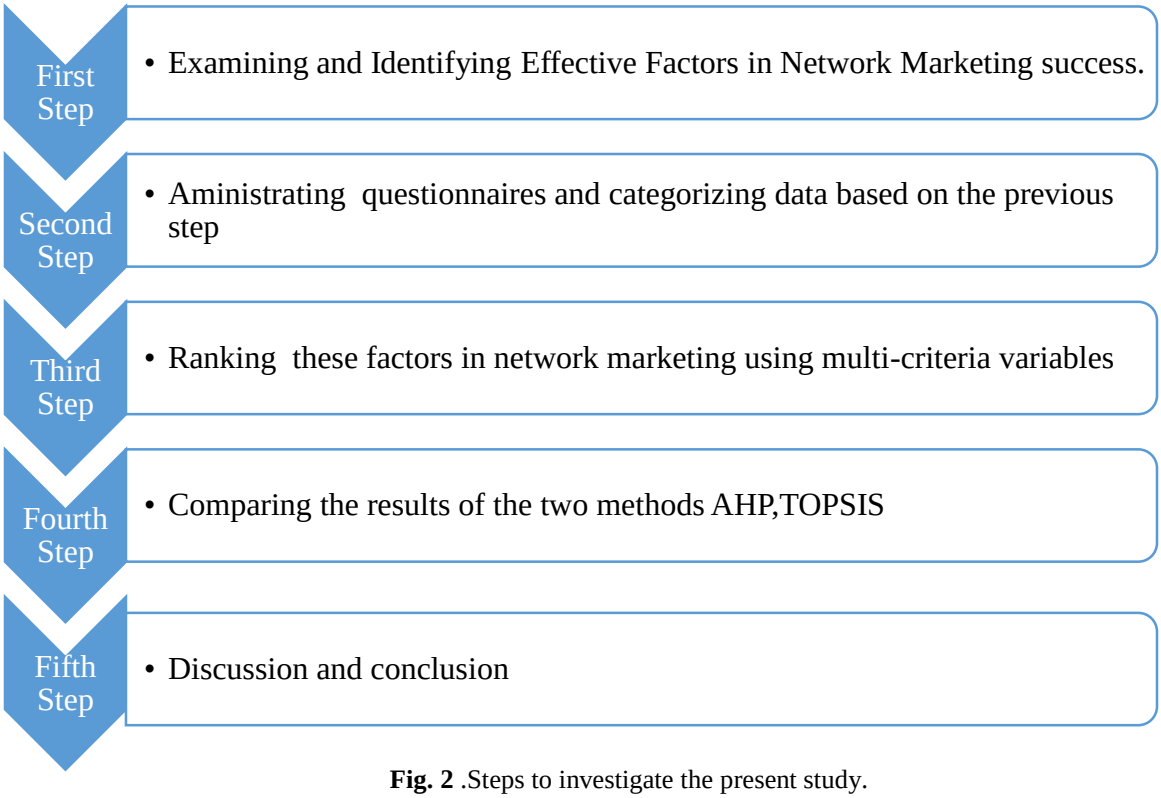


Fig. 2 .Steps to investigate the present study.

4.1. Research Questions

1. What are the effective factors in network marketing success?
2. How ranking of the effective factors in the network marketing success using Topsis is done?
3. How ranking the effective factors in the network marketing success using AHP Technics is done?
4. How do we compare the results of the two methods above?

4.2. Data analysis

In the beginning, we divided the customer's needs into three categories: basic needs, operational needs, and motivational ones. Moreover, for each category of needs, a criterion is considered for their measurement which will be discussed in the following part. Firstly, we examine these factors ranking and then compare the results through AHP and then TOPSIS.
Table 1 compiles customer needs to be based on the Kano and AHP models as follows:

Table 1. Classification of customer needs after the Kano model and its symbols

Symbol	Category	Customer Needs	No
B	**Basic**	Having the appropriate physical environment, optimal structure in different parts of the branch	B1
		Providing high-speed Internet access for distributors	B2
		Location of company branches and ease of access to it	B3
		Having a high speed on shipping goods after ordering customers or marketers	B4
		Lack of damage to the product	B5

		Allocating time by experts for new comers	B6
		Existence Various educational programs	B7
		The existence of related articles and educational relevant files on the company website	B8
		Allocating fair commission for marketers	B9
		Paying commission on time	B10
		Observing the safety tips on the website	B11
O	**Operational**	Having a price commensurate with the true value of the goods	O1
		Creating an appropriate incentive atmosphere for the fastest growth of people in different categories	O2
		Helping people to be master enough to become independent and well-trained	O3
		The existence of appropriate relationships between newcomers and experts	O4
		Having samples of products for viewing in the branch	O5
		The existence of products with a reputable and well-known brand in the market basket.	O6
		Having a various market basket in different product categories	O7
		Quick Accountability to Distributor Issues and Problems	O8
		Having High quality in products	O9
M	**Motivational**	Awards and special benefits	M1
		Having a body of exclusive and especial products in the market basket	M2
		Free transfer	M3
		Having a warranty or possibility of having refund	M4

The observed parameters are in accordance with the AHP method. In a hierarchical analysis method, the elements of each level are compared with each of the higher level elements in pairs and their weight is calculated. These weights are called relative weights. In the next step, by combining relative weights, the final weight of each option is determined. The criteria weight reflect their importance in determining the target. Therefore, the weight of each option relative to the criteria is the proportion of that option in the relative criteria. The final weight of each option is obtained from the sum of multiply of each criteria in the weight of each option of that criterion. In the next step, these factors are ranked by the TOPSIS method.

All parameters are similar to the AHP method and are divided into motivational, operational and basic. In this stage, we will perform both ranking methods, which will be dead important for comparison between both methods.

To solve TOPSIS issues, we need to do the following steps

- Problem structure
- Creating a decision matrix
- Normalizing or disorganizing the matrix
- Weighting to the normalized matrix
- Determining the ideal positive and negative solution
- Determine the distance size of the ideal positive and negative solution

- Calculating of proximity to the ideal positive and negative solution
- Rating Options

5. Calculations based on the AHP method

In order to determine the value and position of each of the indicators, the AHP method was implemented on the output of the Kano model. Initially, a pair of operational, motivational, and basic needs were done by 21 experts. The results are shown in Figure 3.

The inconsistency rate in this problem is 0.031, which is smaller than 0.1, so the comparisons made have a good compatibility.

Then, each of the options relevant to the basic factors were calculated in pairs. The results are shown in Figure 4.

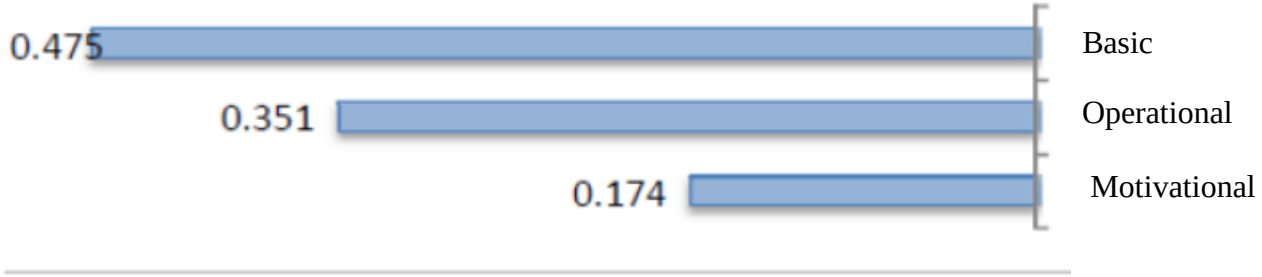


Fig. 3. Pair Comparison.

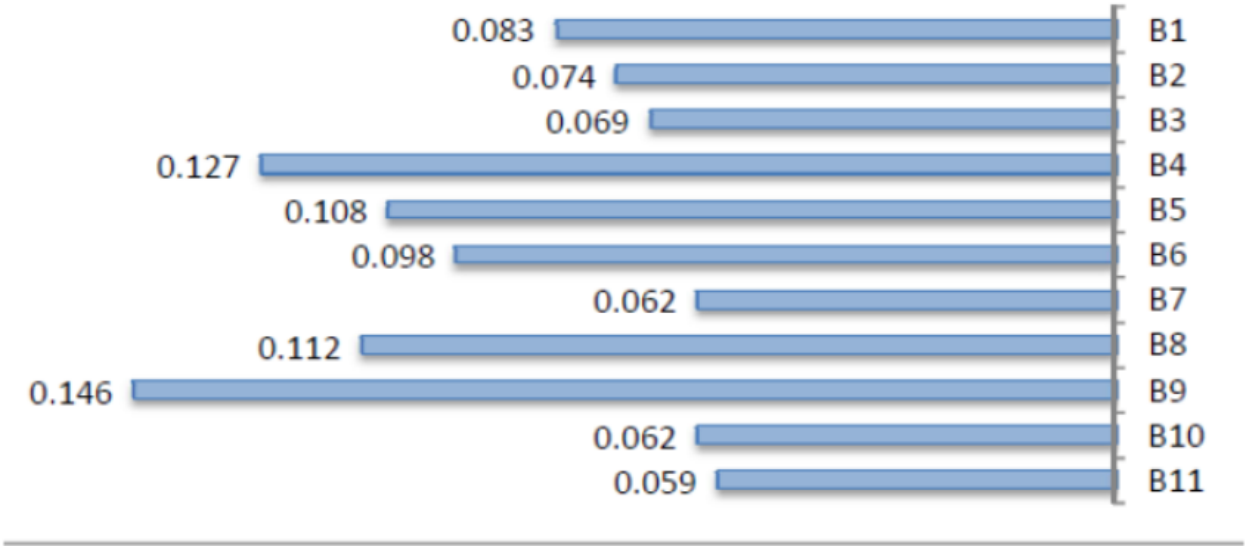


Fig. 4. Comparison of Basic Needs.

In the next part, individual motivational needs were calculated and compared in pairs.

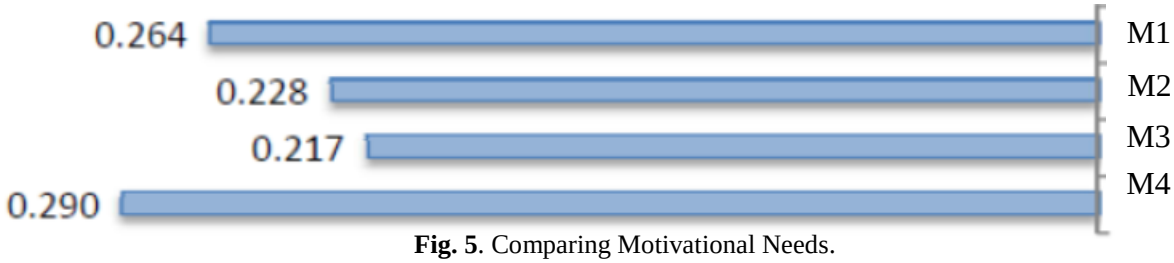


Fig. 5. Comparing Motivational Needs.

In the last step, operational needs were compared in pairs. The results are shown in Figure 6.

5.1. Choosing the effective factor in network marketing using the AHP technique

In the hierarchical analysis process, after doing comparisons in pairs among the basic needs, operational and motivational ones and also comparisons among the variables, the final weight of each option was obtained. The option with the highest weight was ranked first, and the option with the lowest weight was ranked last. The results of this method are shown in Table 2.

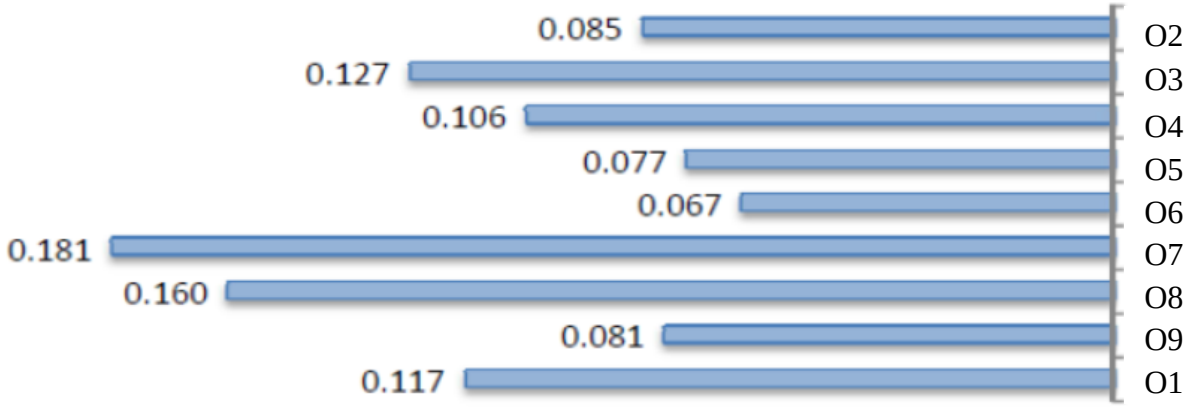


Fig. 6. Pairing Operational Requirements.

Table 2. Ranking options with the help of the AHP method.

Rank	Customer Needs	No
1	Allocating of fair commission for marketers	B9
2	The existence of products with a reputable and well-known brand in market basket.	O6
3	Having a high speed on shipping goods after ordering customers or marketers	B4
4	Having a various market basket of different products in different product categories	O7
5	Lack of damage in the product	B5
6	The existence of related articles and educational relevant files on the company website	B8
7	Having a warranty or possibility of having refund	M4
8	Allocating of time by experts for new comers	B6

Rank	Customer Needs	No
9	Awards and special benefits	M1
10	Creating an appropriate incentive atmosphere for the fastest growth of people in different categories	O2
11	High quality products	O9
12	Having a body of exclusive and special products in the market basket	M2
13	Having the appropriate physical environment, optimal structure and layout in different parts of the branch	B1
14	Free transfer	M3
15	Helping people to be master enough to become independent and well-trained	O3
16	Providing high-speed Internet access for distributors	B2
17	Location of company branches and ease of access to it	B3
18	Having a price commensurate with the true value of the goods	O1
19	Existence various educational programs	B7
20	Paying commission on time	B10
21	Observing the safety tips on the website	B11
22	Quick Accountability to Distributor Issues and Problems	O8
23	The existence of appropriate relationships between newcomers and experts	O4
24	Having samples of products for viewing in the branch	O5

6. Calculations based on the Topsis method

According to the weight obtained from the AHP method, the decision matrix is obtained based on Table 3.

Table 3. Decision matrix.

	Basic	Operational	Motivational
B1	5	3	3
B2	7	5	3
B3	5	3	1
B4	9	5	1
B5	7	5	1
B6	7	3	3
B7	5	3	3
B8	7	3	3
B9	7	7	9
B10	7	3	3
B11	5	3	3
O1	5	7	5
O2	3	7	5
O3	3	9	1
O4	1	5	3
O5	3	5	3
O6	7	9	5

O7	3	9	7
O8	1	5	3
O9	5	7	5
M1	1	3	9
M2	3	3	9
M3	3	5	7
M4	5	5	9
Criteria Type	Positive	Positive	Positive
Criteria weight	0.475	0.351	0.174

In this matrix, the indicator with positive desirability is a profit index and an indicator with a negative one, is the cost index. In fact, the initial step for the implementation of the Topsis steps is to create a decision matrix, which is obtained from questionnaires and based on the hourly spectrum, Table 3.

In this step, the scales in the decision matrix are disorganized. So that each of the values is divided by the same index on the relevant size. To do this, we present a sample of the calculations as follows:

$$A_1 = \frac{5^2}{\sqrt{5^2 + 7^2 + ... + 3^2 + 5^2}}$$

Table 4. Scalability of the decision matrix.

	Basic	Operational	Motivational
B1	0.1952	0.1118	0.1209
B2	0.2733	0.1863	0.1209
B3	0.1952	0.1118	0.0403
B4	0.3514	0.1863	0.0403
B5	0.2733	0.1863	0.0403
B6	0.2733	0.1118	0.1209
B7	0.1952	0.1118	0.1209
B8	0.2733	0.1118	0.1209
B9	0.2733	0.2609	0.3626
B10	0.2733	0.1118	0.1209
B11	0.1952	0.1118	0.1209
O1	0.1952	0.2609	0.2015
O2	0.1171	0.2609	0.2015
O3	0.1171	0.3354	0.0403
O4	0.039	0.1863	0.1209
O5	0.1171	0.1863	0.1209
O6	0.2733	0.3354	0.2015
O7	0.1171	0.3354	0.282
O8	0.039	0.1863	0.1209
O9	0.1952	0.2609	0.2015
M1	0.039	0.1118	0.3626
M2	0.1171	0.1118	0.3626
M3	0.1171	0.1863	0.282

M4	0.1952	0.1863	0.3626

The decision matrix is, in fact, parametric and needs to be quantitated, in this sense, the decision maker determines for each weighted index. The weights are multiplied in the normalized matrix. The results are shown in Table 5.

Table 5. Weighing to a normalized matrix

	Basic	Operational	Motivational
B1	0.0927	0.0392	0.021
B2	0.1298	0.0654	0.021
B3	0.0927	0.0392	0.007
B4	0.1669	0.0654	0.007
B5	0.1289	0.0654	0.007
B6	0.1289	0.0392	0.021
B7	0.0927	0.0392	0.021
B8	0.1298	0.0392	0.021
B9	0.1298	0.0916	0.0631
B10	0.1298	0.0392	0.021
B11	0.0927	0.0392	0.021
O1	0.0927	0.0916	0.0351
O2	0.0556	0.0916	0.0351
O3	0.0556	0.1177	0.007
O4	0.0185	0.0654	0.021
O5	0.0556	0.0654	0.021
O6	0.1298	0.1177	0.0351
O7	0.0556	0.1177	0.0491
O8	0.0185	0.0654	0.021
O9	0.0927	0.0916	0.0351
M1	0.0185	0.0392	0.0631
M2	0.0556	0.0392	0.0631
M3	0.0556	0.0654	0.0491
M4	0.0927	0.0654	0.0631

The two virtual options are actually the worst and best solution (Table 6).

Table 6. Determining the ideal positive and negative solution.

	Basic	Operational	Motivational
+	0.1669	0.1177	0.0631
-	0.0185	0.0392	0.007

We measure the distance between each option by Euclidean methods. It means to find the distance among options from positive and negative ideal options. One can see an example of such calculation in the following part:

$$S_1^+ = \sqrt{(0.0927-0.1669)^2+(0.1177-0.0392)^2+(0.021-0.0631)^2} = 0.1159$$
$$S_1^- = \sqrt{(0.0927-0.0185)^2+(0.0392-0.0392)^2+(0.021-0.007)^2} = 0.0755$$

Table 7. Determining the size of the distance from the ideal positive and negative solution.

	+	-
B1	0.1159	0.0755
B2	0.0767	0.1152
B3	0.1217	0.0742
B4	0.0767	0.1507
B5	0.0852	0.1143
B6	0.0965	0.1122
B7	0.1159	0.0755
B8	0.0965	0.1122
B9	0.0454	0.1351
B10	0.0965	0.1122
B11	0.1159	0.0755
O1	0.0835	0.095
O2	0.1177	0.07
O3	0.1246	0.0868
O4	0.1628	0.0297
O5	0.13	0.0475
O6	0.0465	0.139
O7	0.1122	0.0965
O8	0.1628	0.0297
O9	0.0835	0.095
M1	0.1678	0.0561
M2	0.1362	0.0672
M3	0.1238	0.0619
M4	0.0908	0.0966

In the last step, the proximity of the options was calculated and also the nearest option was chosen as the best. And make the final ranking, which the results are shown in Table 8.

$$C_1 = \frac{0.0755}{0.1159+0.0755} = 0.3945$$

Table 8. Calculation of proximity to the positive and negative ideal solution as well as the ranking of options.

Result	Coefficient of proximity
O6	0.7494
B9	0.7486
B4	0.6626
B2	0.6002
B5	0.5729
B10	0.5376

Result	Coefficient of proximity
B6	0.5376
B8	0.5376
O9	0.5322
O1	0.5322
M4	0.5156
O7	0.4624
O3	0.4106
B11	0.3945
B1	0.3945
B7	0.3945
B3	0.3787
O2	0.3729
M3	0.3333
M2	0.3306
O5	0.2677
M1	0.2505
O8	0.1542
O4	0.1542

6.1. Choosing the Effective factor for Network Marketing Using the Topsis Technique

To determine the perfect option, in the similar method to the fuzzy ideal option, the two concepts of ideal solution and similarity were used in the ideal solution, and also for the ranking of options, the option with the highest similarity index was ranked first and option with the lowest similarity index, was ranked last. The results are shown in Table 9:

Table 9. Proximity Calculation to the positive and negative ideal solution and options ranking.

Rank	Customer Needs	**No**
1	The existence of products with a reputable and well-known brand in the market basket	O6
2	Allocating fair commission for marketers	B9
3	Having a high speed on shipping goods after ordering customers or marketers	B4
4	Provide high-speed Internet access for distributors	B2
5	Lack of damage in product	B5
6	Paying commissions on time	B10
7	Allocating time by experts for new comers	B6
8	The existence of related articles and educational relevant files on the company website	B8
9	High quality products	O9
10	Having a price commensurate with the true value of the goods	O1
11	Having a warranty or possibility of having refund	M4
12	Having a various market basket from different products in different product categories	O7
13	Helping people to be master enough to become independent and well-trained	O3
14	Observing the safety tips on the website	B11
15	Having the appropriate physical environment, optimal structure and layout in different parts of the branch	B1
16	Existence various educational programs	B7
17	Location of company branches and ease of access to it	B3

Rank	Customer Needs	**No**
18	Creating an appropriate incentive atmosphere for the fastest growth of people in different categories	O2
19	Free transfer	M3
20	Having a body of exclusive and special products in the market basket	M2
21	Having samples of products for viewing in the branch	O5
22	Awards, special benefits	M1
23	Quick Accountability to Distributor Issues and Problems	O8
24	The existence of appropriate relationships between newcomers and experts	O4

7. Conclusion

7.1. Comparing ranking effective factors in network marketing success

Here, the obtained results from the two mentioned methods are presented and compared.

A) If the first part of the table contains the top five rankings, one can see that in eighty percent (4 cases) the options are the same, especially in the three top rankings in both methods, so we can conclude that factors like reputable products, allocating fair commissions, high speed in sending orders, are the most important factors which need to be considered in order to be successful in network marketing.

B) If we compare the last rank of these two methods, we will find two common options, one is relating to the appropriate relationships between old and new, and the other to eliminate the doubts among the distributors. Not only, it means that ratings only must be done with the highest grades, but also, it means that the priority is performing with the first grades then you have to go through the next ranks. In fact, the competitive environment may be in a way that companies prefer just the lowest rankings, because higher ranking is performed by most companies. This comparison is shown in Table 10.

Table 10. Comparing the two methods: AHP and TOPSIS.

Rank	TOPSIS	AHP
1	O6	B9
2	B9	O6
3	B4	B4
4	B2	O7
5	B5	B5
6	B10	B8
7	B6	M4
8	B8	B6
9	O9	M1
10	O1	O2
11	M4	O9
12	O7	M2
13	O3	B1
14	B11	M3
15	B1	O3
16	B7	B2

Rank	TOPSIS	AHP
17	B3	B3
18	O2	O1
19	M3	B7
20	M2	B10
21	O5	B11
22	M1	O8
23	O8	O4
24	O4	O5

7.2. Suggestions for further research

It is suggested :

1- To determine the most effective option in network marketing success, other multi-criteria decision-making methods can be used, such as the method of network analysis, because the method of network analysis process overcomes the independence between criteria and options, as one of the constraints of the hierarchical analysis method.

2. To use more criteria for selecting the most effective option.

3. To use the combined AHP-TOPSIS method to compare the results.

7.3. Limitations of the study

There are several limitations that the researcher should be aware

1. In this research, according to multi-criteria decision-making methods, experts' view played an important role in selecting the most effective options to select the most effective option. In fact, the result of this research relies on experts.
2. In a similar method to the ideal option, there is no possibility of analyzing the sensitivity on the criteria, and this only has been performed with a hierarchical analysis method.
3. Increasing the number of suggested options greatly increases the volume of calculations, so a limited number of options should be investigated (although we tried to consider the most possible options).
4. In a similar method to the ideal option to determine the best option, we can investigate a great number of criteria, while in a method like the hierarchical analysis process, there are some limitations.

References

Airas, F. (2015). Network Marketing And Tactile It. *Procedia - Social and Behavioral Sciences*, 191, 47-61.

Fadil, A. (2015). Value co-creation process in small and medium enterprise by utilization of viral marketing as a branding tool: a system dynamic approach. Procedia-Social and Behavioral Sciences, 169, 258-265.

Hawks, J. (2005). System for influence network marketing. U.S. Patent Application No. 10/787,143.

Klein, A., Ahlf, H., and Sharma, V. (2015). Social activity and structural centrality in online social networks. Telematics and Informatics, 32(2), 321-332.

Lee, S., and Walsh, P. (2011). SWOT and AHP hybrid model for sport marketing outsourcing using a case of intercollegiate sport. Sport Management Review, 14(4), 361-369.

Šramová, B. (2015). Marketing and media communications targeted to children as consumers. Procedia-Social and Behavioral Sciences, 191, 1522-1527.