# Selection and Prioritization of The Best Strategies Based on Porter's Generic Strategies .Focused on Waste Paper Recycling Companies in Domestic Market

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**Abstract**— Recently in Iran, One of the most successful businesses is the waste recycling. This business has opened its way as an old and a new business or industry form in domestic production chain. Old and new because of many different products that have recycled .Today many companies are producing and using recycles wastes and waste products as their industries raw materials. Cellulose wastes are widely used in the industries which use in paper mills for recycled paper products. By following of the growing industry and the untapped markets and the high volume of trade for industries, the wastes recycling companies need to choose the best strategies to obtain more shape of domestic markets or keep their shape. This paper aims to present a formulated selection of the best strategies due to the strengths, opportunities, limitations and threats of this special industry and market by analysis of a sample of the industry SWOT matrix and select them by FAHP. In this paper, the Generic strategies are used as criteria for prioritization of selected strategies to achieve and maintain optimum competitive advantage.

**Index Terms**— SWOT analysis, Strategy, Waste management, Waste paper, Recycling; Porter's Generic Strategies, AHP, TOPSIS

## 1 Introduction

Iran is one of the developing countries and its waste production is such as the other developing countries. The first step of describing of the waste management and recycling in Iran needs to explain waste management and waste management as a business and its role in developing countries. Industrial development has generated complex wastes, a complexity not only due to the quantity of wastes, but also to their composition [1]. Industries have traditionally managed their waste products by discharging them into the environment without previous treatment. This practice resulted in an increase of pollution and produced a negative environmental impact. The requirement for environmental quality resulted in a change of the whole concept of pollution control [2]. Effective benefiting of natural resources is crucial for people because of today's societies, which is based on mass production and mass consumption, as well as the extension of populations and consumption in developing countries. Because of that, the production of these large amounts of waste makes it laborious to keep a ready supply of landfill area; todays, increasing emphasis has been given to resource recovery including reusing, recycling and extracting energy from waste. Ambitious goals are being set, and more advanced and more costly approaches to recycling waste are being extended. There are many types of solid wastes especially municipal solid wastes can find in Iran. The major components are food waste, paper, plastic, rags, metal and glass, although demolition and construction debris is often included in collected waste, as are small quantities of hazardous waste, such as electric light bulbs, batteries, automotive parts and discarded medicines and chemicals. [3] Says: generally, industrial solid wastes are classified into the seven major types: 1) Solid wastes from the mining industry 2) Industrial solid wastes from the metallurgical industry 3) Solid wastes from the power industry 4) Solid wastes from the chemical industry 5) Solid wastes from the oil chemical industry 6) Solid wastes from light industry 7) and other industrial solid wastes.

There are many studies about solid waste management and wastes recycling. e.g Wagner et al [4] proposed a new model for solid waste management by of strategy analysis. This paper examines and analyzes the strategy and its current construct to assess whether the Nova Scotia strategy is a model program worthy of consideration at national and other sub-national levels. [5-8] practice about Various dimensions of solid waste management. One of the dimensions of solid waste management is waste recycling [9-12]. This paper focused to cellulose and paper wastes recycling in Iran. The invention of paper speeded the progress of human civilization and promoted the progression of science. The huge consumption of various kinds of paper such as advertising paper, packing paper, newspaper and copy paper in our daily lives indeed reflects that paper is an important material in the world and affects human life deeply [13]. In this paper, the term waste paper refers to paper and cardboard from industrial or household origin which is collected, sorted, and in general reclaimed and processed for recycling. The wastes common used in paper mills for recycled paper products E.g Liang et al [14] compares and investigate environmental impacts of four categories of waste recycling, crop straws, bagasse, textile

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wastes and scrap paper in China's paper industry . Hanan et al [15] employed MCDA to analysis seven recycling, recovery and disposal options against seven environmental, financial and social criteria. It shows MCDA is an effective way of involving community groups in waste management decision making. Berglund et al [16] identified and analyzes the most important determinants of inter-country differences in waste paper rates by employing two regression models and using data for 89 and 81 countries. [17;18] had studied about economic and market assessments of waste paper.

## 2 Paper Waste Recycling

Post-consumer paper, or waste paper, is an important renewable raw material source for the paper industry and can contribute considerably towards reduction in its imports. Its recycling is also important from the environmental perspective, as systematic collection and recycling of waste paper can significantly reduce the generation of municipal solid wastes. It has been estimated that recycling one tonne of waste paper results in a saving of 70% raw material, 60% coal, 43% energy and 70 % water, as compared to making virgin paper from wood. Finally, the recycling process also offers an opportunity for generation of additional income and employment. According to some estimates, one tons of recycled paper saves approximately 17 trees, 2.5 barrels of oil, 4100 Kilowatt hours of electricity, 4 cubic meters of landfill and 31,780 liters of water. Paper is made up of cellulosic fiber sourced from plants. After consumption it often makes its way to trash bins and thus comes to be termed as "waste paper". This waste paper when recovered becomes the reclaimed cellulose fiber base suitable for paper making. Today the term "recycled fiber" is used to refer to the post-consumer paper that has been collected and reused to make paper. Use of recycled fiber for paper making has been picking up the world over, including Iran. Recycling rates vary widely among the top 10 paper-producing countries. South Korea tops the list, recycling an impressive 85 percent of its paper. The United States, the number one paper consumer, has increased its share of paper recycled from roughly one fifth in 1980 to close to half today. China recycles only 35 percent. If every country in the world recycled as much of its paper as South Korea does, the amount of wood used to produce paper worldwide would decrease by a third (table1)(fig1) [19]

TABLE 1
PAPER RECYCLING RATE FOR TOP 10 PAPER PRODUCING COUNTRY
(2000-05)

| Country | Paper Recycling Rate |
|---|---|
| United States | 48% |
| China | 33% |
| Japan | 66% |
| Germany | 66% |
| Canada | 43% |
| Finland | 38% |
| Sweden | 62% |
| South Korea | 77% |
| France | 53% |
| Italy | 46% |
| World | 45% |

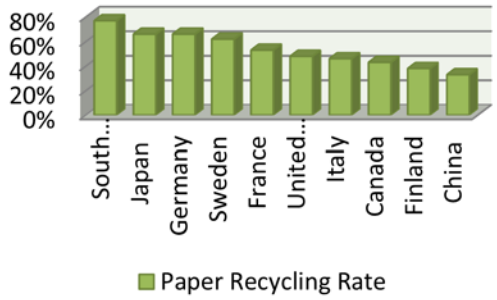


Fig. 1.Magnetization as The rate of paper recycling of the first ten countries

(Fig2) and (Table3) show top ten countries that have most paper recycling in the world .Switzerland with 167.38 tones is on the top of ranking and France with 93.62 has the rank of ten. The important point is that all of these countries are developed country. As the result, it can say recycling rate of countries is directly related of their development.

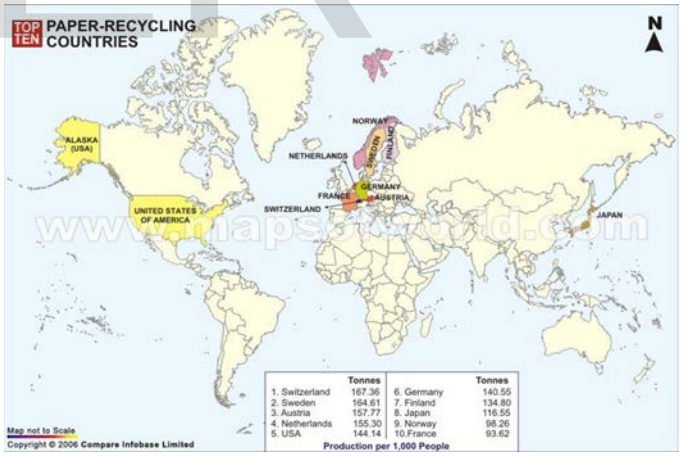


Fig. 2.Top ten countries that have most paper
(WWW.mapsoftheworld.com)

## 3 Paper Recycling in Iran

In recent years, the Persians follow the leading countries in the field of recycling; the "separation of waste at source" is started in some major cities including Isfahan, Tehran, Shiraz, and Mashhad. Unfortunately, despite improving of the culture and general education, still recycling and converting waste in has been fixed and motionless at the first step. It can be said that the biggest reason for the failure of the project is the lack of proper and modern recycling systems ranging

from composting plants and recycling plants, paper and the others. According to the latest physical analysis performed on the waste in Tehran, Average about 4.88 percent of the waste is paper and 4.48%. is cardboard (Local resource and reference). The main problems and barriers in paper recycling is as follow:

1 - The low amount of recycled paper due to:

1.1. Failure to prepare a systematic plan for the isolation and separation from the source by the executive management or municipal source
1.2. Failure to prepare a systematic plan for recycling
1.3. Lack of facilities for isolation and separation from the Source
1.4. Lack separation programs from the source
1.5. Lack of public participation culture.
1.6. Lack of executive education programs for citizens
1.7. Lack of standardized processing industries
1.8. Lack of expertise in building the necessary infrastructure for the recycling industry
1.9. Lack of to organize The local sector of the separation and recycling of materials
1.10. Lack of the official market for recycled materials
1.11. Lack of awareness and encouraging the private sector to activity in the field of recycling
1.12. Lack of budget of municipalities in the field of education programs, the separation of origin and etc.

2. The low quality of produced paper and the rough cardboard surface
3. The low level of technology and production equipment (because of the low level of interest in using modern technology due to low required investment).
4. The low level of public and social awareness

## 4 Method Application and Results

In this paper, the SWOT matrix of an anonymous paper recycling company has been investigated as paper recycling industry because the waste paper recycling companies have a lot of commonalities which can investigate them as a one company. The process of strategies selection begins by reporting of the strengths, weaknesses, opportunities and threats of company as internal factors (first two) and external factors (second two). The second section of the methodology is selection of the strategies by SWOT analysis and fizzy AHP. And the third section is prioritization of the best strategies according to the Porter's Generic strategies.

### 4.1 SWOT Analysis

SWOT analysis is an efficient tool for the detection of environmental conditions and capabilities and widely used in strategic planning processes [20-24]. The illustration of the production cycle of a paper recycling company shows in Fig.3.

The raw material of company is the waste paper or the other paper products such as books, newspaper, paper roll and etc. The wastes will be sorted and packed and transfer to the paper mills. And the paper mills products wastes or carton manufacturers will be again utilized in the recycling company as raw materials and this cycle will continue. The SWOT matrix of company is according this cycle.

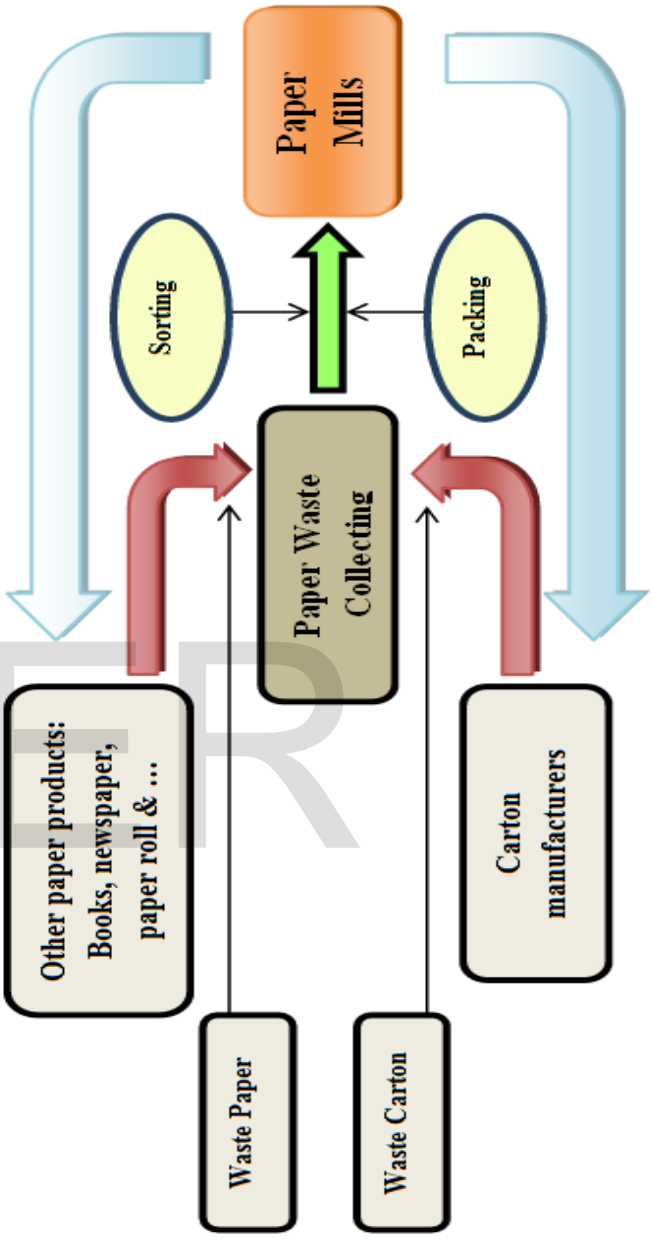


Fig. 3. The production cycle of paper recycling company

The SWOT matrix in Iranian domestic market is as follow as Table.2:

TABLE 2
SWOT matrix of recycling Waste Paper Company.

| Strengths | | Weaknesses | | Opportunities | | Threats | |
|---|---|---|---|---|---|---|---|
| $S_1$ | Investments with high profit | $W_1$ | Lack the use of management expertise | $O_1$ | Lack of strong competitor | $T_1$ | Growing numbers of new competitors |
| $S_2$ | Investment with low risks | $W_2$ | Lack of sufficient financial ability | $O_2$ | Available raw materials | $T_2$ | Imports of waste paper (Due to Balance between supply and demand) |
| $S_3$ | Affordable production | $W_3$ | The use of old technologies | $O_3$ | The supply lower than the demand | $T_3$ | Investment of paper mills in waste paper recycling industry |
| $S_4$ | Non-complex production cycle | $W_4$ | Failure to use scientific methods of production | $O_4$ | There are frequent customers | $T_4$ | Economic turmoil in recent years |
| $S_5$ | Short production chain | $W_5$ | Inefficient management | $O_5$ | The cheap labor | | |
| $S_6$ | The cheap supply | $W_6$ | Local and unreliable suppliers | $O_7$ | Increasing of public culture in sorting of paper wastes | | |
| | | | | $O_8$ | Governmental supports and long-term loans | | |
| Strategies | | | | | | | |
| SO | | ST | | WO | | WT | |
| $SO_1$ | Increasing of production Line ($S_5O_8$) | $ST_1$ | To produce the cheaper products ($S_3$ $T_2$) | $WO_1$ | Using of governmental long-terms ($W_2$ $O_8$) | $WT_1$ | Entering to the suppliers market ($W_6$ $T_3$) |
| $SO_2$ | To hire more manpower ($S_4$ $O_5$) | $ST_2$ | Developing of the firm ($S_3$ $T_1$) | $WO_2$ | Entering to the suppliers market ($W_6$ $O_2$) | | |
| $SO_3$ | To produce more production ($S_1$ $S_2$ $O_4$) | | | | | | |
| $SO_4$ | Entering to the suppliers market ($S_6$ $O_2$) | | | | | | |
| $SO_5$ | To develop the firm ($S_3$ $O_1$ $O_8$) | | | | | | |



## 4.2 Selection of the Strategies by FAHP

The Fuzzy AHP (FAHP) is employed to analyze the SWOT matrix. According to [25], the analytic hierarchy process (AHP) is an approach that is suitable for dealing with complex systems related to making a choice from among several alternatives and which provides a comparison of the considered options, firstly proposed by [26]. The SWOT AHP model for the waste paper recycling company is shown in Fig.4:

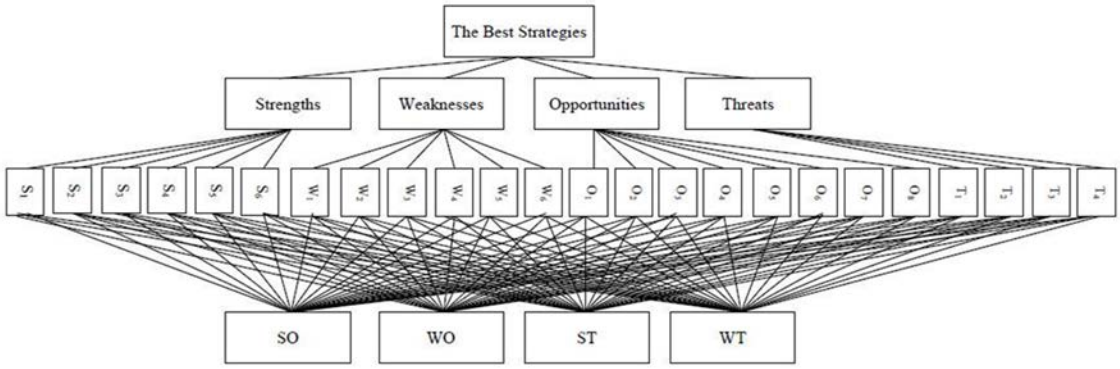


Fig. 2.The hierarchy process (AHP) model for the firm

Chang [27] introduced Fuzzy analytic hierarchy process (FAHP). Let $X = \{X_1, X_2, X_3, \dots, X_n\}$ an object set, and $G = \{g_1, g_2, g_3, \dots, g_n\}$ be a goal set. According to e.g Chang [27] extent analysis, each criterion is taken and extent analysis for each criterion, thus, $m$ extent analysis values for each object can be obtained as follow:

$\mathrm{M}_{\mathrm{gi}}^{1}, \mathrm{M}_{\mathrm{gi}}^{2}, \dots, \mathrm{M}_{\mathrm{gi}}^{\mathrm{m}}, \quad i = 1,2, \dots, n$

Where all $\mathrm{M}_{\mathrm{gi}}^{\mathrm{j}}$ are TFNs. With following of the Laarhoven and Pedrycz [28] the fuzzy process is: A fuzzy number $\tilde{A}$ on X is a TFN if its membership function $\mu_{\tilde{A}}(x): X \to [0,1]$ equals.

$$\mu_{\tilde{A}}(x) = \begin{cases} (x-l)/(m-l), & l \ll x \ll m, \\ (u-x)/(u-m), & m \ll x \ll u, \\ 0, & otherwise. \end{cases} \quad (1)$$

If a TFN be $\tilde{A} = (l, m, u)$, the operational law of two TFNs $\tilde{A}_1 = (l_1, m_1, u_1)$ and $\tilde{A}_2 = (l_2, m_2, u_2)$ are:

1) $\tilde{A}_1 + \tilde{A}_2 = (l_1, m_1, u_1) + (l_2, m_2, u_2) = (l_1 + l_2, m_1 + m_2, u_1 + u_2)$. (2)
2) $\tilde{A}_1 - \tilde{A}_2 = (l_1, m_1, u_1) - (l_2, m_2, u_2) = (l_1 - u_2, m_1 - m_2, u_1 - l_2)$. (3)
3) $\tilde{A}_1 \times \tilde{A}_2 = (l_1, m_1, u_1) \times (l_2, m_2, u_2) \cong (l_1 \times l_2, m_1 \times m_2, u_1 \times u_2),\ for\ l_i > 0, m_i > 0, u_i > 0$. (4)
4) $\tilde{A}_1 / \tilde{A}_2 = (l_1, m_1, u_1) / (l_2, m_2, u_2) \cong (l_1/u_2, m_1/m_2, u_1/l_2)\ for\ l_i > 0, m_i > 0, u_i > 0$. (5)

The steps of Chang's extent analysis can be given as in the following:

Step.1: The fuzzy synthetic extent value $(S_i)$ with respect to the $i^{th}$criterion is defined as following equation (Eq.6):

$$S_k = \sum_{j=1}^{n} \mathrm{M}_{\mathrm{gi}}^{\mathrm{j}} \left[ \sum_{i=1}^{n} \times \sum_{j=1}^{m} \mathrm{M}_{\mathrm{gi}}^{\mathrm{j}} \right]^{-1} \quad (6)$$

To obtain $\sum_{j=1}^{n} \mathrm{M}_{\mathrm{gi}}^{\mathrm{j}}$, the fuzzy addition operation of m extent analysis values for a particular matrix is performed such as

$$\sum_{j=1}^{n} \mathrm{M}_{\mathrm{gi}}^{\mathrm{j}} = \left( \sum_{j=1}^{m} l_j, \sum_{j=1}^{m} m_j, \sum_{j=1}^{m} u_j, \right) \quad (7)$$

And to obtain $\left[ \sum_{i=1}^{n} \times \sum_{j=1}^{m} \mathrm{M}_{\mathrm{gi}}^{\mathrm{j}} \right]^{-1}$, the fuzzy addition operation of $\mathrm{M}_{\mathrm{gi}}^{\mathrm{j}}$ values is performed such as:

$$\sum_{i=1}^{n} \times \sum_{j=1}^{m} \mathrm{M}_{\mathrm{gi}}^{\mathrm{j}} = \left( \sum_{j=1}^{m} l_j, \sum_{j=1}^{m} m_j, \sum_{j=1}^{m} u_j, \right) \quad (8)$$

then the inverse of the vector above is computed, such as

$$\left[ \sum_{i=1}^{n} \times \sum_{j=1}^{m} \mathrm{M}_{\mathrm{gi}}^{\mathrm{j}} \right]^{-1} = \left( \frac{1}{\sum_{j=1}^{m} u_j}, \frac{1}{\sum_{j=1}^{m} m_j}, \frac{1}{\sum_{j=1}^{m} l_j}, \right) \quad (9)$$

Step.2: If $M_1$ and $M_2$ are two triangular fuzzy numbers, the degree of possibility of $M_2 = (l_2, m_2, u_2) \geq M_1 = (l_1, m_1, u_1)$ is defined as:

$$V(M_2 \geq M_1) = Sup_{y \geq x}\left(min\left(\mu_{M_1}(x), \mu_{M_2}(y)\right)\right) \quad (10)$$

And can be equivalently expressed as follows:

$$V(M_2 \geq M_1) = hgt(M_1 \cap M_2) = \mu_{M_2}(d)$$

$$= \begin{cases} 1 & if\, m_2 \geq m_1, \\ 0 & if\, l_2 \geq u_2, \\ \dfrac{l_1 - u_1}{(m_2 - u_2) - (m_1 - l_1)} \end{cases} \quad (11)$$

The degree possibility for a convex fuzzy number to be greater than k convex fuzzy numbers $M_i (i = 1,2,3, \dots, k)$ can be defined by:

$$V(M_2 \geq M_1, M_2, \dots, M_k) = V[(M \geq M_1) \text{and } (M \geq M_2) \text{and } \dots (M \geq M_K)] = \min(M \geq M_1),\ i = 1,2,3, \dots, k \quad (12)$$

Assume that

$$d'(A_i) = \min V(S_i \geq S_k) \quad (13)$$

For $K = 1,2,3, \dots, n; K \neq i$ . Then the weight vector is given by

$$W' = \left((d'(A_1), d'(A_2), \dots, d'(A_n))\right)^T, \quad (14)$$

Where $A_i (i = 1,2,3, \dots, n)$ are $n$ elements.

Step 4: With normalization, the normalized weight vectors are

$$W = (d(A_1), d(A_2), \dots, d(A_n))^T \quad (15)$$

In this paper, the strategies considered as a group. It means, when SO selected after applying method, the SO's strategies are selected as the best strategies. After applying method, the result is:

$$SO > WO > ST > WT$$

## 4.2 Prioritization of the Strategies according to Generic Strategies (FTOPSIS)

Porter has defined a category scheme consisting of three general types of strategies that are widely used in businesses to achieve and maintain competitive advantage. Porter's generic strategy matrix, which highlights cost leadership, differentiation and focus [29] as the three basic choices for firms, has dominated corporate competitive strategy for the last three decades [30]. Porter called the generic strategies "Cost Leadership", "Differentiation" and "Focus". Also he subdivided the Focus strategy into two parts: "Cost Focus" and "Differentiation Focus". Table.3 shows the generic strategies.

Table.3. shows the generic strategies

| Scope | | Source of Competitive Advantage: Cost | Source of Competitive Advantage: Differentiation |
|---|---|---|---|
| | Board | Cost Leadership | Differentiation |
| | Narrow | Cost Focus | Differentiation Focus |

In this paper, the Generic strategies are used as criteria for prioritization of selected strategies to achieve and maintain optimum competitive advantage. In this paper, the Fuzzy Technique for order performance by similarity to ideal solution (FTOPSIS) is employed to prioritize the selected strategies. The original TOPSIS method developed and introduced by [31] .TOPSIS is based on the concept that the selected alternative must have the shortest distance from the positive ideal solution and the farthest from the negative ideal solution for solving a multiple criteria decision-making problem[32;33]. The original decision matrix of selected strategies as alternatives and Porter's Generic strategies as criteria is as follow the Table.6 and the Linguistic

variables for the importance weight of each criterion and the Linguistic variables for the scoring of each alternative are shown in Table.4 and Table.3:

TABLE 4
Linguistic variables for the importance weight of each criterion.

| Description | Scale | Measure |
|---|---|---|
| Almost Certain | VL | (0,0,0.1) |
| Highly Likely | L | (0,0.1,0.3) |
| Likely | ML | (0.1,0.3,0.5) |
| Possible | M | (0.3,0.5,0.7) |
| Unlikely | MH | (0.5,0.7,0.9) |
| Rare | H | (0.7,0.9,1) |
| None-Identified | VH | (0.9,1,1) |

TABLE 4
Linguistic variables for the scoring of each alternative

| Description | Scale | Measure |
|---|---|---|
| Very Poor | VP | (0,0, 1) |
| Poor | P | (0, 1, 3) |
| Medium Poor | MP | (1, 3, 5) |
| Fair | F | (3, 5, 7) |
| Medium Good | MG | (5, 7, 9) |
| Good | G | (7, 9,1) |
| Very Good | VG | (9,1,1) |

Table.6. the decision matrix

| | Cost Leadership | Cost Focus | Differentiation | Differentiation Focus |
|---|---|---|---|---|
| $SO_1$ | G | P | VG | M |
| $SO_2$ | F | P | G | MP |
| $SO_3$ | F | MG | G | F |
| $SO_4$ | MP | MP | MG | P |
| $SO_5$ | MG | F | VG | VP |

The FTOPSIS technique is as following steps:
By respect to the

$max_j, \tilde{x}_j^+ = \left(a_j^+, b_j^+, c_j^+\right), \quad j = 1,2,\dots,n$ (16)

$min_j, \tilde{x}_j^+ = \left(a_j^-, b_j^-, c_j^-\right), \; j = 1,2,\dots,n$ (17)

**Step.1** The normalized decision matrix calculated as:

If $\left(\tilde{x}_{ij}\right)$ belongs benefit criteria then $\tilde{r}_{ij} = \tilde{x}_{ij}(/)\tilde{x}_j^+ = \left(\frac{a_{ij}}{c_j^+}, \frac{b_{ij}}{b_j^+}, \frac{c_{ij}}{a_j^+}\right)$ (18)

If $\left(\tilde{x}_{ij}\right)$ belongs cost criteria then

$\tilde{r}_{ij} = \tilde{x}_j^-(/)\tilde{x}_{ij} = \left(\frac{a_j^-}{c_{ij}}, \frac{b_j^-}{b_{ij}}, \frac{c_j^-}{a_{ij}}\right)$ (19)

**Step.2** With respect to the (Eq.20):
$\tilde{a} = (a_1, a_2, a_3), r \times \tilde{a} = (ra_1, ra_2, ra_3)$ (20)
The weighted decision matrix will calculate as (E.q.21)

$\tilde{v}_{ij} = w_j(\times)\tilde{r}_{ij}$ (21)
Where $W_j = (0.102, 0.331, 0.013, 0.522)$
The weights are depending on the expert decision:
**Step.3** Determining fuzzy positive and negative ideal solutions are defined as:

$M(v_{ij}) = \frac{-a_{ij}^2 - a_{ij}.b_{ij} + b_{ij}.c_{ij} + c_{ij}^2}{3(c_{ij} - a_{ij})}$ [34] (22)

Where $\tilde{a} = (a_1, a_2, a_3)$

The maximum of $M(v_{ij})$ will be selected as positive ideal ($v_j^+$). Eq. (23)

The minimum of $M(v_{ij})$ will be selected as positive ideal ($v_j^-$). Eq. (24)

$v_j^+ = (a^+.b^+, c^+), \quad \tilde{v}_j^+ = \max_i(\tilde{v}_{ij}) \quad i = 1,2,\dots,m; \quad j = 1,2,3,\dots,n$ (23)

$v_j^- = (a^-.b^-, c^-), \quad \tilde{v}_j^- = \min_i(\tilde{v}_{ij}) \quad i = 1,2,\dots,m; \quad j = 1,2,3,\dots,n$ (24)

And

$A^+ = [v_1^*, v_2^*, v_3^*, v_4^*]; \; A^- = [v_1^-, v_2^-, v_3^-, v_4^-]$ (25)

**Step.4** the distance between alternatives to the ideal solutions computed as:

According to the vertex method [35]:

$d(\tilde{a}, \tilde{b}) = \left(\frac{1}{3}[(a_1 - b_1)^2 + (a_2 - b_3)^2 + (a_3 - b_3)^2]\right)^{\frac{1}{2}}$ (26)

Where $\tilde{a} = (a_1, a_2, a_3)$ and $\tilde{b} = (b_1, b_2, b_3)$

*(d)* is the distance (interval) between two fuzzy numbers therefore

$$D_{ij}^{+} = \quad d(\tilde{v}_{ij}, \tilde{v}^{+}) = \left(\frac{1}{3}\left[(a_{ij} - a^{+})^2 + (b_{ij} - b^{+})^2 + (c_{ij} - c^{+})^2\right]\right)^{\frac{1}{2}} \quad (27)$$

$$D_{ij}^{-} = \quad d(\tilde{v}_{ij}, \tilde{v}^{-}) = \left(\frac{1}{3}\left[(a_{ij} - a^{-})^2 + (b_{ij} - b^{-})^2 + (c_{ij} - c^{-})^2\right]\right)^{\frac{1}{2}} \quad (28)$$

Where $D_{ij}^{+}$ and $D_{ij}^{-}$ are crisp and $\tilde{x}_{ij} = (a_{ij}, b_{ij}.c_{ij})$.

The distance between $A_i$ and positive ideal, $A_i$ and negative ideal is:

$$S_i^{+} = \sum_{j=1}^{n} D_{ij}^{+} \quad (29) \quad ; S_i^{-} = \sum_{j=1}^{n} D_{ij}^{-} \quad (30)$$

**Step.5** Calculation of the relative closeness to the ideal solution (Eq.31):

$$CC_i^{+} = \frac{S_i^{-}}{S_i^{+} + S_i^{-}} \quad (31) \quad \begin{cases} CC_1^{+} = 0.5374 \\ CC_2^{+} = 0.5647 \\ CC_3^{+} = 0.9467, \\ CC_4^{+} = 0.2355 \\ CC_5^{+} = 0.1850 \end{cases}$$

**Step.6** Ranking and prioritization of the alternatives based on their relative closeness to the ideal solution.

$$SO_3 > SO_2 > SO_1 > SO_4 > SO_5$$

# 5 Conclusion

Recently in Iran, One of the most successful businesses is the Waste Recycling. This business has opened its way as an old and a new business or industry form in domestic production chain. Old and New because of many different products that have recycled .Today many companies are producing and using recycles wastes and waste products as their industries raw materials .One of the wastes that widely used in the industries is cellulose wastes that use in paper mills for recycled paper products. By attention of this growing industry and the untapped markets and the high volume of trade for industries, the wastes recycling companies need to choose the best strategies to obtain more shape of domestic markets or keep their shape. Iran is one of the developing countries and its waste production is such as the other developing countries. The most important feature of Iranian paper recycling industry can be considered low quality and technology level in factory equipment. Although the low level of used technology is compatible with limited investment but it cannot compete with the best quality paper products. This paper aims to use a formulated framework to select and prioritize the best strategies of waste paper recycling industry. At first, the SWOT matrix designed depends on experts' opinions and decision. As mentioned in SWOT the Opportunities of this industry overcomes to its' Threats. By attention to Strengths and Opportunities factors, this industry is a high profit business and as it seemed after analyzing SWOT matrix by FAHP the SO strategies has been selected. In next step, to achieve and maintain competitive advantage, the paper used Generic Porter's Strategies. it is widely used in business analysis processes. And after ranking of SO strategies the result are as follow:

$$SO_3 > SO_2 > SO_1 > SO_4 > SO_5$$

By looking at the SO strategies, Strengths and Opportunities factors, this prioritization is completely logical.

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