Priority Analysis of Decision Making in Social Entrepreneurship

M Khaﬁ Zuhanda1, Muhathir2, Denny Meisandy Hutauruk1

1Department of Civil Engineering, Faculty of Engineering at Universitas Medan Area, Medan, Indonesia
2Department of Informatics Engineering, Faculty of Engineering at Universitas Medan Area, Medan, Indonesia

Received 14 January 2020; Accepted 30 January 2020

Abstract: Social entrepreneur is someone who understands social problems and uses the ability of entrepreneurship to make social change. There are several criteria in choosing the priority aspects of a social entrepreneur's decision making, including aspects of social change, aspects of community needs, aspects of ROI, and aspects of renewal that need to be considered by a social entrepreneur. Therefore, a social entrepreneur needs the ability to analyze in every decision taken, because it involves the economic sustainability of the people involved. Analytic hierarchy process (AHP) method is one of the decision making models that is often used. AHP is generally used with the aim to prioritize various alternatives/options available and the choices are complex or multi-criteria. In general, by using AHP, the resulting priorities will be consistent with the theory, logical, transparent, and participatory. So this method will be used as a decision maker in social entrepreneurship.

Keywords: Social Entrepreneurship, AHP, Decision Making

I. INTRODUCTION

Today, most college graduates prioritize after graduation looking for work compared to entrepreneurship. Though a college graduate should be more critical and innovative in opening up employment opportunities to face life's challenges.

A social entrepreneur is someone who has the ability to understand social problems and uses the ability of his/her entrepreneurship to make social changes, especially in the areas of welfare, education and health. If business entrepreneurs measure the success of their financial performance (profit or income), then the social entrepreneur's success is measured by the benefits felt by the community.

Social entrepreneurship is usually preceded by a sense of concern for the social conditions in the community which empties into a new or novelty business model. Social entrepreneurship is a fusion or a combination of great passion in social mission with discipline, innovation and determination as is commonly found in the business world. All that can be said is that social entrepreneurship uses an entrepreneurial mental attitude for social purposes.

Social entrepreneurship is an alternative solution that is creative, and educative because it is not only oriented to mere profit but also the welfare of society. Through social entrepreneurship Indonesia's economic problems can be slightly resolved. Because with this, the community will be directly involved in becoming business people and the profits will be returned to the community to be developed. The long-term goal, social entrepreneurship can help people become more financially independent and not always rely on government policies that tend to be only artificial sweeteners, such as subsidies and direct cash assistance.

A Social Entrepreneur must be clever in making decisions in reading opportunities because it involves the lives of many people. There are several aspects of strategy in decision making such as aspects of return of investment (ROI), aspects of community needs, aspects of social change, to renewal. Generally it can be said that taking or making a decision means choosing one of the many alternatives. There are at least two alternatives and in practice more than two alternatives where the decision maker or decision maker must choose one based on certain considerations or criteria (Dalalah, 2010). Social entrepreneurship, there are several alternatives in weighing in prioritizing decision strategies such as innovation, market development and developing the potential of local communities.

The essence of decision making is located in the formulation of various selection alternatives appropriate after an evaluation (assessment) of its effectiveness in achieving the desired goals of the decision maker. One of the most important components of the decision making process is the activity of gathering information from which an appreciation of the decision situation can be made (Mousavi, 2010).

Decision makers almost always make decisions, even in their daily lives. When humans make decisions, there is a process that occurs in the human brain that will determine the quality of decisions made. When decisions are made as simple as choosing the color of clothes, humans can easily make decisions. However, when decisions to be taken are complex with large risks such as policy formulation, decision makers often need tools in the form of analyzes that are scientific, logical, and structured/consistent. One such analysis tool is a decision making model that allows them to make decisions for complex problems.
As social entrepreneurs must also make various decisions, one of the most common types of decisions is to prioritize (choose) business opportunities from various alternatives / choices. Every time an entrepreneur is faced with several choices of opportunities. In this case, an entrepreneur must arrange research priorities based on agreed criteria (Zhang, 2009).

Analytic hierarchy process (AHP) method is one of the decision-making models that is often used. AHP is generally used with the aim of prioritizing various alternatives / options available and the choices are complex or multi-criteria. In general, by using AHP, the resulting priorities will be consistent with theory, logical, transparent, and participatory (Ameri, 2013). With increasingly high demands relating to transparency and participation. Analytic hierarchy process (AHP) is very suitable to be made as a decision maker in social entrepreneurship. In line with this paper, researchers will try to solve problems in determining priorities in decision making in social entrepreneurship.

II. RESEARCH METHODS

In general, research conducted with several stages, namely:
1. Conduct studies of journals, books and articles on the internet related to the analytic hierarchy process.
2. Arrange the questionnaire.
3. Distribution of questionnaires to respondents.
4. Analyze data using the basic principles of the analytic hierarchy process method.
5. Conclusions from the results of research in order of priority decisions using the analytic hierarchy process (AHP).

III. DISCUSSION

This chapter will examine the determination of the priority order of the criteria of social entrepreneurs in determining priorities in making social decision strategies using the AHP method.

3.1 Calculation of the Hierarchy Weighting Factor For All Criteria

To calculate the criteria matrix values are as follows:
1. Compile the data criteria that become aspects of social entrepreneurship in making priority decisions in the company on a pairwise comparison matrix.
2. Simplify the matrix by adding up the values in each column of the matrix. With the following calculation:

\[ J_{c1} = \sum_{i=1}^{4} a[i,1], \]
\[ J_{c2} = \sum_{i=1}^{4} a[i,2], \]
\[ J_{c3} = \sum_{i=1}^{4} a[i,3], \]
\[ J_{c4} = \sum_{i=1}^{4} a[i,4]. \]

Information:
\( J_{c1} \) = Number of column return of investment aspect criteria
\( J_{c2} \) = Number of column requirement orientation aspect criteria
\( J_{c3} \) = Number of column social transformation aspect criteria
\( J_{c4} \) = Number of column renewal aspect criteria

The results of the sum of the criteria columns can be seen in Table 1.
Table 1. Hierarchy Weighting Factor Matrix for All Simplified Criteria

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Return of Investment Aspect</th>
<th>Requirement Orientation Aspect</th>
<th>Social Transformation Aspect</th>
<th>Renewal Aspect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return of Investment Aspect</td>
<td>1</td>
<td>0,91</td>
<td>0,85</td>
<td>0,98</td>
</tr>
<tr>
<td>Requirement Orientation Aspect</td>
<td>1.1</td>
<td>1</td>
<td>2,08</td>
<td>1,36</td>
</tr>
<tr>
<td>Social Transformation Aspect</td>
<td>1.18</td>
<td>0,48</td>
<td>1</td>
<td>1,38</td>
</tr>
<tr>
<td>Renewal Aspect</td>
<td>1,02</td>
<td>0,73</td>
<td>0,73</td>
<td>1</td>
</tr>
</tbody>
</table>

∑ = 4,3 3,12 4,66 4,72

3. Normalize the matrix by dividing the value of each cell in Table 1 by the number of each column. Then, normalized relative weights will be obtained. The eigenvector value is generated from the average relative weight for each row. With the following calculation:

Element Value of Each Column

Normalization of Eigen Vectors = (Number of Each Line) / (Number of Lines)

Information : N_{ek} = The value of the element in each criterion column

For elements a_{11} = \frac{1}{4,3} = 0,232558, etc.

Eigen vector (first line) = \frac{0,232558 + 0,291667 + 0,182403 + 0,207627}{4} = 0,2224 etc.

Then, the results obtained from the calculations can be seen in Table 2.

Table 2. Hierarchy Weighting Factor Matrix for All Normalized Criteria

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Return of Investment Aspect</th>
<th>Requirement Orientation Aspect</th>
<th>Social Transformation Aspect</th>
<th>Renewal Aspect</th>
<th>Vector Normalization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return of Investment Aspect</td>
<td>0,2325</td>
<td>0,2916</td>
<td>0,1824</td>
<td>0,2076</td>
<td>0,2285</td>
</tr>
<tr>
<td>Requirement Orientation Aspect</td>
<td>0,2558</td>
<td>0,3205</td>
<td>0,4463</td>
<td>0,2881</td>
<td>0,3277</td>
</tr>
<tr>
<td>Social Transformation Aspect</td>
<td>0,2744</td>
<td>0,1538</td>
<td>0,2145</td>
<td>0,2923</td>
<td>0,2338</td>
</tr>
<tr>
<td>Renewal Aspect</td>
<td>0,2372</td>
<td>0,2339</td>
<td>0,1566</td>
<td>0,2118</td>
<td>0,2099</td>
</tr>
</tbody>
</table>

4. Calculate the maximum eigenvalue \lambda_{\text{maximum}} which is obtained by adding up the multiplication results of the number of columns with eigen vectors.

\lambda_{\text{maximum}} = (4,3x0,2285) + (3,12x0,3277) + (4,66x0,2338) + (4,72x0,2099)

= 4,085

5. Calculate the consistency index value. Because the matrix is order 4 (ie consists of 4 criteria), the consistency index value obtained is

CI = \frac{\lambda_{\text{maximum}} - n}{n - 1} \cdot \frac{n}{n - 1}

= \frac{4,085 - 4}{0,085} \cdot \frac{4}{3}

= 0,282

For n = 4, so RI = 0,90:

CR = \frac{CI}{RI} = \frac{0,282}{0,9} = 0,031 < 0,1000
Because $CR < 0.1000$ then the results of the calculation of the criteria are consistent. From the calculation results in Table 2 shows that aspect criteria.

![Figure 1. Normalization of Eigen Vectors](image)

Need orientation is the most important criterion that is highly considered in the process of decision making strategies in social entrepreneurship with a weight of 0.3277 or 32.77%, next is the social change aspect criteria with a weight of 0.2338 or 23.38%, then the Return Aspect criteria of Investment with a weight of 0.2285 or 22.85%, and finally the renewal aspect criteria with a weight of 0.2099 or 20.99%.

### 3.2 Calculation of Evaluation Factors for Return of Investment Aspects

To calculate the criteria matrix values are as follows:

1. Compile data criteria that become aspects of social entrepreneurship in decision making in the company on a pairwise comparison matrix.
2. Simplify the matrix by adding up the values in each column of the matrix. With the following calculation:

$$J_{k1} = \sum_{i=1}^{3} a[i,1],$$

$$J_{k2} = \sum_{i=1}^{3} a[i,2],$$

$$J_{k3} = \sum_{i=1}^{3} a[i,3],$$

Information:

- $J_{k1}$ = Number of innovation strategy criteria columns
- $J_{k2}$ = Number of market development strategy criteria columns
- $J_{k3}$ = Number of local potential development strategy criteria columns

The results of the sum of the criteria columns can be seen in Table 3.

#### Table 3. Hierarchy Weighting Factor Matrix for All Simplified Criteria

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Innovation Strategy</th>
<th>Market Development Strategy</th>
<th>Local Development Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation Strategy</td>
<td>1</td>
<td>1.19</td>
<td>0.72</td>
</tr>
<tr>
<td>Market Development Strategy</td>
<td>0.84</td>
<td>1</td>
<td>1.23</td>
</tr>
<tr>
<td>Local Potential Development Strategy</td>
<td>1.39</td>
<td>0.81</td>
<td>1</td>
</tr>
<tr>
<td>$\sum$</td>
<td>3.23</td>
<td>3</td>
<td>2.95</td>
</tr>
</tbody>
</table>

3. Normalize the matrix by dividing the value of each cell in Table 3 by the number of each column. Then, normalized relative weights will be obtained. The eigenvector value is generated from the average relative weight for each row. With the following calculation:
Priority Analysis of Decision Making in Social Entrepreneurship

Nek = Element Value of Each Column
Normalization of Eigen Vectors
= Normalization of Number of Columns
Number of Each Line
Number of Lines
Information: Nek = The value of the element in each criterion column
For elements a11 = \( \frac{1}{3,23} = 0,3095 \), etc
Eigen vector (baris pertama) = \( \frac{0,3095 + 0,3966 + 0,2440}{3} \)
= 0,3167 etc.
Then, the results obtained from the calculations can be seen in Table 4.

Table 4. Hierarchy Weighting Factor Matrix for All Normalized Criteria

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation Strategy</td>
<td>0,3095</td>
<td>0,3966</td>
<td>0,2440</td>
<td>0,3167</td>
</tr>
<tr>
<td>Market Development Strategy</td>
<td>0,2600</td>
<td>0,3333</td>
<td>0,4169</td>
<td>0,3367</td>
</tr>
<tr>
<td>Local Potential Development Strategy</td>
<td>0,4303</td>
<td>0,27</td>
<td>0,3389</td>
<td>0,3464</td>
</tr>
</tbody>
</table>

4. Calculate the maximum eigenvalue \( \lambda_{\text{maximum}} \) which is obtained by adding up the multiplication results of the number of columns with eigen vectors.
\[
\lambda_{\text{maximum}} = (3,23 \times 0,3167) + (3 \times 0,3367) + (2,95 \times 0,3464)
\]
\[
= 3,054921
\]
5. Calculates the consistency index value. Because the matrix is order 3 (ie consists of 3 criteria), the consistency index value obtained is:
\[
\text{CI} = \frac{\lambda_{\text{maximum}} - n}{n - 1} = \frac{3,054 - 3}{3 - 1} = \frac{0,054}{2} = 0,027
\]
For n = 3, so RI = 0,58
\[
\text{CR} = \frac{\text{CI}}{\text{RI}} = \frac{0,027}{0,58} = 0,046 < 0,1000
\]
Because CR < 0,1000 then the results of the calculation of the criteria are consistent.
Priority Analysis of Decision Making in Social Entrepreneurship

Figure 2. Normalization of Eigen Vectors

From the results of calculations in Table 4 shows that: Local Potential Development Strategy criteria are the most important criteria and are highly considered in the decision making process based on the Aspect of Return of Investment in social entrepreneurship with a weight of 0.3464 or 34.64%, next is the Strategy criteria Market Development with a weight of 0.3367 or 33.67%, and finally the Innovation Aspect criteria with a weight of 0.3167 or 31.67%.

3.3 Calculation of Factor Evaluation of Orientation Aspects of Community Needs

To calculate the criteria matrix values are as follows:
1. Compile the data criteria that become aspects of social entrepreneurship in decision making in the company on a pairwise comparison matrix.
2. Simplify the matrix by adding up the values in each column of the matrix. With the following calculation:
   \[ J_{k1} = \sum_{i=1}^{3} a[i, 1], \]
   \[ J_{k2} = \sum_{i=1}^{3} a[i, 2], \]
   \[ J_{k3} = \sum_{i=1}^{3} a[i, 3], \]

   \[ J_{k1} = \text{Number of innovation strategy criteria columns} \]
   \[ J_{k2} = \text{Number of market development strategy criteria columns} \]
   \[ J_{k3} = \text{Number of local potential development strategy criteria columns} \]

The results of the sum of the criteria columns can be seen in Table 5.

Table 5. Hierarchy Weighting Factor Matrix for All Simplified Criteria

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation Strategy</td>
<td>1</td>
<td>1.78</td>
<td>1.08</td>
</tr>
<tr>
<td>Market Development Strategy</td>
<td>0.56</td>
<td>1.02</td>
<td>0.98</td>
</tr>
<tr>
<td>Local Potential Development Strategy</td>
<td>0.93</td>
<td>0.98</td>
<td>1.02</td>
</tr>
<tr>
<td>( \sum )</td>
<td>2.49</td>
<td>3.8</td>
<td>3.06</td>
</tr>
</tbody>
</table>
3. Normalize the matrix by dividing the value of each cell in Table 5 by the number of each column. Then, normalized relative weights will be obtained. The eigenvector value is generated from the average relative weight for each row. With the following calculation:

\[ N_{ek} = \frac{\text{Element Value of Each Column}}{\text{Number of Columns}} \]

Normalization of Eigen Vectors

\[ = \frac{\text{Number of Each Line}}{\text{Number of Lines}} \]

Information: \( N_{ek} \) = The value of the element in each criterion column

For elements \( a_{11} = \frac{1}{2.49} = 0.4016 \), etc.

\[ \text{Eigen vector (first line)} = \frac{0.4016 + 0.4684 + 0.3529}{3} = 0.4076 \text{ etc.} \]

Then, the results obtained from the calculations can be seen in Table 6.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation Strategy</td>
<td>0.4016</td>
<td>0.4684</td>
<td>0.3529</td>
<td>0.4076</td>
</tr>
<tr>
<td>Market Development Strategy</td>
<td>0.2249</td>
<td>0.2631</td>
<td>0.3202</td>
<td>0.2694</td>
</tr>
<tr>
<td>Local Potential Development Strategy</td>
<td>0.3734</td>
<td>0.2684</td>
<td>0.3267</td>
<td>0.3229</td>
</tr>
</tbody>
</table>

4. Calculate the maximum eigenvalue \( \lambda_{\text{maximum}} \) which is obtained by adding up the multiplication results of the number of columns with eigen vectors.

\[ \lambda_{\text{maximum}} = (2.49 \times 0.4076) + (3.8 \times 0.2694) + (3.06 \times 0.3229) \]
\[ = 3.0267 \]

5. Calculates the consistency index value. Because the matrix is order 3 (ie consists of 3 criteria), the consistency index value obtained is:

\[ CI = \frac{\lambda_{\text{maximum}} - n}{n - 1} \]
\[ = \frac{3.0267 - 3}{3 - 1} \]
\[ = \frac{0.0267}{2} \]
\[ = 0.01335 \]

For \( n = 3 \), \( RI = 0.58 \) so:

\[ CR = \frac{CI}{RI} = \frac{0.01335}{0.58} = 0.023 < 0.1000 \]

Because CR < 0.1000 the results of the calculation of the criteria are consistent.
From the calculation results in Table 6 shows that: Innovation Strategy criteria are the most important criteria and are highly considered in the process of decision making strategies based on the orientation aspects of community needs in social entrepreneurship with a weight of 0.4076 or 40.76%, next is the Potential Development Strategy criteria Local with a weight of 0.3229 or 32.29%, and finally the criteria for Market Development Aspect with a weight of 0.2694 or 26.94%.

3.4 Calculation Factors Evaluating Aspects of Social Change

To calculate the criteria matrix values are as follows:
1. Compile the data criteria that become aspects of social entrepreneurship in decision making in the aspect of social change in the pairwise comparison matrix.
2. Simplify the matrix by adding up the values in each column of the matrix. With the following calculation:

$J_{k_1} = \sum_{i=1}^{3} a[i, 1]$

$J_{k_2} = \sum_{i=1}^{3} a[i, 2]$

$J_{k_3} = \sum_{i=1}^{3} a[i, 3]$

$J_{k_1}$ = Number of innovation strategy criteria columns

$J_{k_2}$ = Number of market development strategy criteria columns

$J_{k_3}$ = Number of local potential development strategy criteria columns

The results of the sum of the criteria columns can be seen in Table 7.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation Strategy</td>
<td>1</td>
<td>0.97</td>
<td>0.6</td>
</tr>
<tr>
<td>Market Development Strategy</td>
<td>1.03</td>
<td>1</td>
<td>0.85</td>
</tr>
<tr>
<td>Local Potential Development Strategy</td>
<td>1.66</td>
<td>1.18</td>
<td>1</td>
</tr>
<tr>
<td>$\sum$</td>
<td>3.69</td>
<td>3.15</td>
<td>2.45</td>
</tr>
</tbody>
</table>

3. Normalize the matrix by dividing the value of each cell in Table 7 by the number of each column. Then, normalized relative weights will be obtained. The eigenvector value is generated from the average relative weight for each row. With the following calculation:
Priority Analysis of Decision Making in Social Entrepreneurship

\[
N_{ek} = \frac{\text{Element Value of Each Column}}{\text{Number of Columns}}
\]

Normalization of Eigen Vectors = \[
\frac{\text{Number of Each Line}}{\text{Number of Lines}}
\]

Information: \(N_{ek} = \text{The value of the element in each criterion column}\)

Untuk elemen \(a_{11} = \frac{1}{3,69} = 0,2710\), etc.

Eigen vector (baris pertama)
\[
= \frac{0,4016 + 0,4684 + 0,3529}{3}
= 0,4076 \text{ etc.}
\]

The results of the sum of the criteria columns can be seen in Table 8.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation Strategy</td>
<td>0.2710</td>
<td>0.3079</td>
<td>0.2448</td>
<td>0.2746</td>
</tr>
<tr>
<td>Market Development Strategy</td>
<td>0.2791</td>
<td>0.3174</td>
<td>0.3469</td>
<td>0.3145</td>
</tr>
<tr>
<td>Local Potential Development Strategy</td>
<td>0.4498</td>
<td>0.3746</td>
<td>0.4081</td>
<td>0.4108</td>
</tr>
</tbody>
</table>

4. Calculate the maximum eigenvalue \(\lambda_{\text{maximum}}\) which is obtained by adding up the multiplication results of the number of columns with eigen vectors.
\[
\lambda_{\text{maximum}} = (3,69 \times 0,2746) + (3,15 \times 0,3145) + (2,45 \times 0,4108)
\]
\[= 3,0104\]

5. Calculates the consistency index value. Because the matrix is order 3 (ie consists of 3 criteria), the consistency index value obtained is:
\[
\text{CI} = \frac{\lambda_{\text{maximum}} - n}{n} \times \frac{n - 1}{n - 1}
\]
\[= \frac{3,0104 - 3}{3}
\]
\[= \frac{0,0104}{3}
\]
\[= 0,0052\]

For \(n = 3, RI = 0,58\) so:
\[
\text{CR} = \frac{\text{CI}}{\text{RI}} = \frac{0,0052}{0,58} = 0,0089 < 0,1000
\]

Because \(\text{CR} < 0.1000\) the results of the calculation of the criteria are consistent.
Priority Analysis of Decision Making in Social Entrepreneurship

Figure 4. Normalization of Eigen Vectors

From the results of calculations in Table 8 shows that: the criteria of the Local Potential Development Strategy is the most important criteria and is highly considered in the process of decision making strategies based on aspects of social change in social entrepreneurship with a weight of 0.4108 or 41.08%, then the strategy criteria Development of Local Potential with a weight of 0.3145 or 31.45%, and finally the Innovation Aspect criteria with a weight of 0.2746 or 27.46%.

3.5 Calculation Factor Evaluation of Renewal Aspects

To calculate the criteria matrix values are as follows:

1. Compile data criteria that become aspects of social entrepreneurship in decision making in the renewal aspect of the pairwise comparison matrix.

2. Simplify the matrix by adding up the values in each column of the matrix. With the following calculation:

\[ J_{k1} = \sum_{i=1}^{3} a[i,1], \]

\[ J_{k2} = \sum_{i=1}^{3} a[i,2], \]

\[ J_{k3} = \sum_{i=1}^{3} a[i,3], \]

\[ J_{k1} = \text{Number of innovation strategy criteria columns} \]

\[ J_{k2} = \text{Number of market development strategy criteria columns} \]

\[ J_{k3} = \text{Number of local potential development strategy criteria columns} \]

The results of the sum of the criteria columns can be seen in Table 9.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Innovation Strategy</th>
<th>Market Development Strategy</th>
<th>Local Development Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation Strategy</td>
<td>1</td>
<td>1.69</td>
<td>1.35</td>
</tr>
<tr>
<td>Market Development Strategy</td>
<td>0.59</td>
<td>1</td>
<td>1.53</td>
</tr>
<tr>
<td>Local Potential Development Strategy</td>
<td>0.74</td>
<td>0.66</td>
<td>1</td>
</tr>
<tr>
<td>( \sum )</td>
<td>2.33</td>
<td>3.35</td>
<td>3.88</td>
</tr>
</tbody>
</table>

3. Normalize the matrix by dividing the value of each cell in Table 9 by the number of each column. Then, normalized relative weights will be obtained. The eigenvector value is generated from the average relative weight for each row. With the following calculation:

\[ N_{ek} = \frac{\text{Element Value of Each Column}}{\text{Number of Columns}} \]

\[ \text{Normalization of Eigen Vectors} = \frac{\text{Number of Each Line}}{\text{Number of Lines}} \]

Information: \( N_{ek} \) = The value of the element in each criterion column
For element \( a_{11} = \frac{1}{2,33} = 0,4292 \), etc.

Eigen vector (first line) = \( \frac{0,4292 + 0,5045 + 0,3479}{3} = 0,4272 \)

The results of the sum of the criteria columns can be seen in Table 10.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation Strategy</td>
<td>0,4292</td>
<td>0,5045</td>
<td>0,3479</td>
<td>0,4272</td>
</tr>
<tr>
<td>Market Development Strategy</td>
<td>0,2532</td>
<td>0,2985</td>
<td>0,3943</td>
<td>0,3154</td>
</tr>
<tr>
<td>Local Potential Development Strategy</td>
<td>0,3176</td>
<td>0,1970</td>
<td>0,2577</td>
<td>0,2574</td>
</tr>
</tbody>
</table>

4. Calculate the maximum eigenvalue \( \lambda_{\text{maximum}} \) which is obtained by adding up the multiplication results of the number of columns with eigen vectors.

\[
\lambda_{\text{maximum}} = (2,33 \times 0,4272) + (3,35 \times 0,3154) + (3,88 \times 0,2574)
\]

\[= 3,0506\]

5. Calculate the consistency index value. Because the matrix is order 3 (ie consists of 3 criteria), the consistency index value obtained is:

\[
CI = \frac{\lambda_{\text{maximum}} - n}{n - 1} = \frac{3,0506 - 3}{3 - 1} = \frac{0,0506}{2} = 0,0253
\]

For \( n = 3 \), RI = 0.58 so:

\[
CR = \frac{CI}{RI} = \frac{0,0253}{0,58} = 0,043 < 0,1000
\]

Because CR <0.1000 the results of the calculation of the criteria are consistent.

From the results of calculations in Table 10 show that: Innovation Strategy criteria are the most important criteria and are highly considered in the process of decision making strategies based on novelty aspects in social entrepreneurship with a weight of 0.4272 or 42.72%, then the Market Development Strategy criteria with a weight of 0.3154 or 31.54%, and finally the criteria for Local Potential Development Strategy with a weight of 0.2574 or 25.74%.
3.6 Calculation of Total Ranking/Global Priorities

3.6.1 Total Evaluation Factors

From all evaluations carried out on the 4 criteria, namely the Return of Investment Aspect, the Orientation Aspect of Community Needs, the Social Change Aspect, and the Renewal Aspect, which are then multiplied by the priority vector. Thus, obtained a table of the relationship between criteria and alternatives.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Return of Investment Aspect</th>
<th>Requirement Orientation Aspect</th>
<th>Social Transformation Aspect</th>
<th>Renewal Aspect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation Strategy</td>
<td>0.3167</td>
<td>0.4076</td>
<td>0.2746</td>
<td>0.4272</td>
</tr>
<tr>
<td>Market Development Strategy</td>
<td>0.3367</td>
<td>0.2694</td>
<td>0.3145</td>
<td>0.3154</td>
</tr>
<tr>
<td>Local Potential Development Strategy</td>
<td>0.3464</td>
<td>0.3229</td>
<td>0.4108</td>
<td>0.2574</td>
</tr>
</tbody>
</table>

3.6.2 Total Ranking

To find the total ranking of each alternative of the selection process is to multiply the evaluation factors of each alternative by the weighting criteria criteria by multiplying the matrix of Table 11 with Table 2 so that it can be described in the form of a matrix as follows:

\[ Ax = b \]

Information:
- A = Vector eigen of each criterion
- x = Eigen Vector pairwise comparison of each criterion
- b = Global priority or ranking

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Ranking</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation Strategy</td>
<td>0.2777</td>
<td>3</td>
</tr>
<tr>
<td>Market Development Strategy</td>
<td>0.3149</td>
<td>2</td>
</tr>
<tr>
<td>Local Potential Development Strategy</td>
<td>0.4072</td>
<td>1</td>
</tr>
</tbody>
</table>

From Table 12 it can be seen that a Social Entrepreneur prefers priorities to develop the potential of the surrounding community, then subsequently provides and develops existing markets, then looks at the innovation side to be able to compete and exist with other competitors.

IV. CONCLUSION

The results of the analysis by the AHP method in making priority decisions in social entrepreneurship:

1. Aspect of orientation needs is the most important criterion that is highly considered in the process of decision making strategies in social entrepreneurship with a weight of 0.3277 or 32.77%, then the criteria for aspects of social change with a weight of 0.2338 or 23.38%, then criteria for the aspect of return of investment with a weight of 0.2285 or 22.85%, and the last criterion for the renewal aspect with a weight of 0.2099 or 20.99%.

2. Potential potential development strategies are the most important criteria and are highly considered in the decision making process process based on aspects of return of investment in social entrepreneurship with a weight of 0.3464 or 34.64%, then the market development strategy criteria with a weight of 0.3367 or 33.67%, and finally the criteria for Transformational Innovation Aspects with a weight of 0.3167 or 31.67%.

3. Transformational innovation strategy is the most important criteria and is highly considered in the process of decision making strategies based on the orientation aspects of community needs in social entrepreneurship with a weight of 0.4076 or 40.76%, next is the criteria for developing a local potential strategy with a weight of 0.3229 or 32.29%, and finally the criteria for Market Development aspects with a weight of 0.2694 or 26.94%.
4. Local potential development strategies are the most important criteria and are highly considered in the process of decision making strategies based on aspects of social change in social entrepreneurship with a weight of 0.4108 or 41.08%, then the criteria for local potential development strategies with a weight of 0.3145 or 31.45%, and finally the criteria for transformational innovation aspects with a weight of 0.2746 or 27.46%.

5. Transformational innovation strategy is the most important criteria and is highly considered in the process of decision making strategies based on novelty aspects in social entrepreneurship with a weight of 0.4272 or 42.72%, then the market development strategy criteria with a weight of 0.3154 or 31.54 %, and the last is the local potential development strategy criteria with a weight of 0.2574 or 25.74%.

6. In the aggregate the total social entrepreneur prefers the priority of developing the potential of the surrounding community, then subsequently providing and developing the existing market, then looking at the innovation side to be able to compete and exist with other competitors.

REFERENCE


