Research on Fabric Supplier Selection of Uniqlo based on Strategic Sourcing

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I. Introduction

With the development of economic globalization and regional economic integration and the increasingly fierce global competition, the requirement of apparel industry is improved gradually. The power of a single clothing company can’t meet the personal demand of consumers any more. It is necessary to integrate industrial fabric suppliers and downstream distributors into a holistic supply chain system. Then SPA model (Specialty Store Retailer of Private Label Apparel) keeps up with the rapid development of the situation.

The SPA model is still in its early stages in China so that advanced SPA model oversea is really instructive to local apparel enterprise. As a famous clothing brand in SPA model, shell fabric is one of Uniqlo’s core competences. In recent years, Uniqlo attaches great importance to strategic purchasing. Owing to this, it is beneficial to do a research about the fabric supplier selection of Uniqlo whose fabric supplier are mostly in China. The economic development mode will be quickened to drive the regional development, even the transition of the trade if domestic textile enterprises can maintain friendly cooperation with Uniqlo. This paper is based on consulting and summarizing the research of domestic and foreign scholars on strategic purchasing, SPA model and supplier selection. In order to offer these significative suggestions for Uniqlo’s next fabric purchasing strategy, many efforts were made. Firstly, by interviewing consultants and technical staff of Uniqlo and researching the situation of present suppliers, I selected the factors of Uniqlo’s choosing suppliers, and then established index system of selection and evaluated weight of each index. Combining those indexes with the current Uniqlo’s fabric suppliers and exploiting empirical analysis, some feasible suggestions finally came out. At the same time, facing the actuality that more and more international SPA enterprises are marching into Chinese market, suggestions are also put forward to local Chinese enterprises’ in improving their competitiveness by making changes in fabric Sourcing. In addition, this paper combines with the Uniqlo’s selection criteria for fabric suppliers and puts forward suggestion to domestic textile enterprises to improve its own strength to join the procurement network of international SPA enterprises.

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II. The Literature Review

2.1 Research on Supplier Relationship in Strategic Sourcing

Project, market and technical knowledge of supplier is critical to the success of enterprises. Through effective cost management, strategic sourcing can deliver value and provide critical information about the supply business. Establishing close partnerships with key suppliers provides companies with competitive advantage. Carr (1999) considered that maintaining good relationships with suppliers contributes to the successful implementation of strategic sourcing, since it can meet their overall needs. Jayarama (2011) claimed that supplier is the most critical external resource for an enterprise, and establishing strategic partnerships with suppliers will help enterprises to obtain competitive advantage. Griffith (2011) observed that establishing strategic cooperative partnerships with supplier is beneficial to cooperation, which is also the source of innovation. After studying many large Japanese manufacturing companies, Choi and Hong (2002) found that these companies have implemented a strategic sourcing strategy, the perfect “alliance system” which is established with supplier dramatically improves the company’s competitive advantage. Therefore, a good supplier relationship management is important to enhance the performance of enterprises.

2.2 Research on Supplier Selection Index System

Dickson (1966) is a pioneer in supplier selection research, he studied a lot of literatures on sourcing, and he has summed up 50 factors that have effected on supplier selection. Besides, he generalized the 20 kinds of indexes when enterprises considered supplier selection and gave the order of importance of these indicators. The three most important indexes that enterprises emphasized are price, quality and efficiency of transport. Weber (1991) studied all the papers on supplier selection prior to 1991, and obtained the most valued indexes when companies choose partners by using specific statistical methods: cost, on-time delivery, quality, equipment. Zhiming combined the both correlational research of Dickson and Weber, summed up the new supplier selection criteria and the appropriate supplier selection methods by collating relevant literature of the subsequent supplier selection Index System.

III. The Construction of Uniqlo Fabric Supplier Selection Index System and Evaluation Criteria

3.1 Construction of Index System

In this paper, fabric supplier selection criteria layer containing six factors which include the quality of capacity, production skills, price level, market sensitivity, delivery capacity, environmental indicators has been established based on multi-objective decision theory of Analytic Hierarchy Process.

Wherein the capabilities include rate of qualified product, quality improvement capacity, quality system; production skills include productivity advantages, technical level, research and development capabilities; price level includes product cost and cost control ability; market sensitivity includes information processing capability and product improvements; delivery capacity includes delivery punctuality, the sample timely, emergency order processing; environmental indicators include labor working environment and environmental sustainability. As shown in Table 1.
3.2 Construction of evaluation criteria

After visiting experts including advisers, technical personnel and scholars who researching on SPA mode in Uniqlo, the evaluation criteria of related indicators of Uniqlo fabric supplier are summarized. Meanwhile, we ultimately come up with the evaluation criteria of Uniqlo fabric supplier selection based on the experience of fabric supplier selection of other international SPA enterprises. As shown in Table 4-1.

Table 1 Hierarchical structure chart of Uniqlo fabric supplier selection

Table 2 the evaluation criteria of Uniqlo fabric supplier selection (the five-grade marking system)

<table>
<thead>
<tr>
<th>Serial number</th>
<th>Evaluation index</th>
<th>1 point</th>
<th>2 points</th>
<th>3 points</th>
<th>4 points</th>
<th>5 points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rate of qualified products</td>
<td>&lt;96%</td>
<td>&gt;=96%but&lt;97%</td>
<td>&gt;=97%but&lt;98%</td>
<td>&gt;=98%but&lt;99%</td>
<td>&gt;= 99%</td>
</tr>
<tr>
<td>2</td>
<td>Quality improvement ability</td>
<td>Through the comments for quality improvement, but can not be recognised by customers</td>
<td>Through the comments for quality improvement and exceeding customer recognition</td>
<td>Through comments for quality improvement and exceed customer expectations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Quality system</td>
<td>Didn’t apply for ISO9001</td>
<td>In the application of ISO9001</td>
<td>Obtain the certification of ISO9001 and ISO14001</td>
<td>Obtain the certification of ISO9001 and ISO14001</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Productivity advantage</th>
<th>Production capacity is lower than the same level of industry about 10%</th>
<th>Production capacity is lower than the same level of industry about 5%</th>
<th>Production capacity is equal to the average size company</th>
<th>Production capacity is higher than the same level of industry about 5%</th>
<th>Production capacity is higher than the same level of industry about 10%</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Technological level</td>
<td>Production facilities, workers, technological level can’t meet the needs of the Uniqlo</td>
<td>Production facilities, workers, technological level can not fully meet the needs of the Uniqlo</td>
<td>Production facilities, workers, technological level can basically meet the needs of Uniqlo</td>
<td>Production facilities, workers, technological level can completely meet the needs of the Uniqlo</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>R&amp;D ability</td>
<td>Don’t have the personnel and new product development capability that Uniqlo needs</td>
<td>Equipped with a certain research and development personnel, but did not form effective development ability</td>
<td>Basicly have the personnel and new product development capability that Uniqlo needs</td>
<td>Completely have the personnel and new product development capability that Uniqlo needs</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Product costs</td>
<td>The average cost of product is higher than the industry level and above 5%</td>
<td>The average cost of product is higher than the industry level, but within 5%</td>
<td>The average cost of product is equivalent to the level of the industry</td>
<td>The average cost of product is more than 3% below the industry level</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Cost control ability</td>
<td>No plans to reduce costs</td>
<td>Ongoing cost reduction plan</td>
<td>Have been identified the factors of ability of reducing the cost</td>
<td>Have short-term plans to achieve cost reduction objectives</td>
<td>Have been identified the factors of ability of reducing the cost</td>
</tr>
<tr>
<td>9</td>
<td>Information processing capability</td>
<td>Can’t be able to obtain real-time updates production files and order system configuration through the information system</td>
<td>Can get update production file and order through the information system, but there are quite a time delay</td>
<td>Can regularly (twice a day) obtain the updated production files and order system configuration through the information system</td>
<td>Can obtain real-time update production documents and order system configuration Through the information system</td>
<td>Can get the update production file and immediately order system configuration through the information system, and automatically reply to confirm receipt</td>
</tr>
<tr>
<td>10</td>
<td>Product improvement cycle</td>
<td>Can’t meet the demands of Uniqlo’s rapid response</td>
<td>Can basically grasp the latest trends of the market, but the improved cycle of products can’t meet the demand of Uniqlo’s rapid response</td>
<td>Can basically meet the rapid response of Uniqlo’s needs</td>
<td>Can timely grasp the latest market demand, but the product’s ability that adapt to market needs to be improved</td>
<td>Can timely grasp the demands of market</td>
</tr>
</tbody>
</table>
3.3 Study of Uniqlo fabric suppliers Selection Model

3.3.1 Criteria layer weight calculation

Evaluation factors of criteria layer include quality capacity, production skills, the price level, market sensitivity, delivery capability, environmental indicators. According to the hierarchy shown in Table 1, and comments of relevant experts, the judgment matrix A can be obtained:

\[
\begin{bmatrix}
1 & 3 & 3 & 4 & 5 & 7 \\
1/3 & 1 & 2 & 3 & 4 & 6 \\
1/3 & 1/2 & 1 & 2 & 4 & 6 \\
1/4 & 1/3 & 1/2 & 1 & 3 & 5 \\
1/5 & 1/4 & 1/4 & 1/3 & 1 & 3 \\
1/7 & 1/6 & 1/6 & 1/5 & 1/3 & 1 \\
\end{bmatrix}
\]

We obtain eigenvectors:

\[ W^{(1)} = [0.3975, 0.2306, 0.1711, 0.1119, 0.0583, 0.0306]^T \]
Then we proceed consistency check:

\[
\begin{bmatrix}
1 & 3 & 3 & 4 & 5 & 7 \\
1/3 & 1 & 2 & 3 & 4 & 6 \\
1/3 & 1/2 & 1 & 2 & 4 & 6 \\
1/4 & 1/3 & 1/2 & 1 & 3 & 5 \\
1/5 & 1/4 & 1/4 & 1/3 & 1 & 3 \\
1/7 & 1/6 & 1/6 & 1/5 & 1/3 & 1
\end{bmatrix}
\]

\[
[0.3975 \quad 0.2306 \quad 0.1711 \quad 0.1119 \quad 0.0583 \quad 0.0306]^T =
\begin{bmatrix}
2.5559 \\
1.4578 \\
1.0596 \\
0.7017 \\
0.3674 \\
0.1962
\end{bmatrix}
\]

\[
\lambda_{max} = \frac{1}{6} \left( 2.5559 + 1.4578 + 1.0596 + 0.7017 + 0.3674 + 0.1962 \right) = 6.3207
\]

Thus we get:

\[
\begin{align*}
\lambda_{max} &= \frac{1}{6} \left( 2.5559 + 1.4578 + 1.0596 + 0.7017 + 0.3674 + 0.1962 \right) \\
&= 6.3207
\end{align*}
\]

Using the formula Matrix Consistency Index:

We can calculate the consistency ratio is 0.0509 < 0.1. In this case, the matrix pass the consistency test.

The results have been collated, summarized below in Table 3-1.

### Table 3-1 the results of criterion layer factor weight calculation of Uniqlo fabric supplier selection

<table>
<thead>
<tr>
<th>M</th>
<th>A₁</th>
<th>A₂</th>
<th>A₃</th>
<th>A₄</th>
<th>A₅</th>
<th>A₆</th>
<th>(W^{(i)})</th>
</tr>
</thead>
<tbody>
<tr>
<td>A₁</td>
<td>Quality ability</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>A₂</td>
<td>Production skills</td>
<td>1/3</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>A₃</td>
<td>Price level</td>
<td>1/3</td>
<td>1/2</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>A₄</td>
<td>Market sensitivity</td>
<td>1/4</td>
<td>1/3</td>
<td>1/2</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>A₅</td>
<td>Delivery Performance</td>
<td>1/5</td>
<td>1/4</td>
<td>1/4</td>
<td>1/3</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>A₆</td>
<td>Environmental index</td>
<td>1/7</td>
<td>1/6</td>
<td>1/6</td>
<td>1/5</td>
<td>1/3</td>
<td>1</td>
</tr>
</tbody>
</table>

### 3.3.2 Layer factors weights calculation

The three indiators of ability in quality include rate of qualified products, quality improvement capacity, quality system. According to the hierarchy shown in Table 1, and the comments of experts, the results are summarized in Table 3-2

### Table 3-2 Calculation results of index layer factors weights

<table>
<thead>
<tr>
<th>Aᵢ</th>
<th>Bᵢ</th>
<th>B₂</th>
<th>B₃</th>
<th>(W^{(i)})</th>
</tr>
</thead>
<tbody>
<tr>
<td>A₁</td>
<td>Rate of qualified products</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>B₁</td>
<td>Quality improvement ability</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>B₂</td>
<td>Quality system</td>
<td>1/3</td>
<td>1/3</td>
<td>1</td>
</tr>
</tbody>
</table>
After calculation, we obtain:

\[ \lambda_{\text{max}} = 3 \]
\[ n = 3 \]
\[ C.I. = 0 \]
\[ C.R. = 0 \leq 0.1 \]

Judgment matrix has consistency.

The weight set of factors A1 = (0.4286, 0.4286, 0.1428).

The indexes of Production skills include productivity advantages, technical level, research and development capabilities. According to the hierarchy shown in Table 1 and suggestions of experts, the results of calculation are in Table 3-3.

<table>
<thead>
<tr>
<th>A1</th>
<th>B2</th>
<th>B3</th>
<th>B4</th>
<th>W^2</th>
</tr>
</thead>
<tbody>
<tr>
<td>B2</td>
<td>Productivity advantage</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>B3</td>
<td>Technological level</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>B4</td>
<td>R&amp;D ability</td>
<td>1/3</td>
<td>1/3</td>
<td>1</td>
</tr>
</tbody>
</table>

After calculation, we obtain:

\[ \lambda_{\text{max}} = 3 \]
\[ n = 3 \]
\[ C.I. = 0 \]
\[ C.R. = 0 \leq 0.1 \]

Judgment matrix has consistency.

The weight set of factors A2 = (0.4286, 0.4286, 0.1428).

The indexes of price level include product cost, cost control. According to the hierarchy shown in Table 1, and comments of relevant experts, the calculation results are summarized in Table 3-4.

<table>
<thead>
<tr>
<th>A1</th>
<th>B2</th>
<th>B3</th>
<th>W^2</th>
</tr>
</thead>
<tbody>
<tr>
<td>B2</td>
<td>Product costs</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>B3</td>
<td>Cost control ability</td>
<td>1/3</td>
<td>1</td>
</tr>
</tbody>
</table>
After calculation, we obtain:

$$\lambda_{\text{max}} = 2$$
$$n = 2$$
$$C.I. = 0$$
$$C.R. = 0 \leq 0.1$$

Judgment matrix has consistency.

The weight set of factors $A_3 = (0.25, 0.75)$.

The indexes of market sensitivity include information processing capacity, product improvement cycle. According to the hierarchy shown in Table 1 and opinions of experts, the calculation results are summarized in Table 3-5.

<table>
<thead>
<tr>
<th>$A_i$</th>
<th>$B_{11}$</th>
<th>$B_{10}$</th>
<th>$W^{(2)}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$B_9$</td>
<td>Information processing capability</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>$B_{10}$</td>
<td>Product improvement cycle</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

After calculation, we obtain:

$$\lambda_{\text{max}} = 2$$
$$n = 2$$
$$C.I. = 0$$
$$C.R. = 0 \leq 0.1$$

Judgment matrix has consistency.

The weight set of factors $A_4 = (0.5, 0.5)$.

The indexes of delivery ability include delivery punctuality, sample timely emergency order processing capability. According to the hierarchy shown in Table 1, and comments of relevant experts, the calculation results are summarized in Table 3-6.
After calculation, we obtain:

\[ \lambda_{\text{max}} = 3 \]
\[ n = 3 \]
\[ C.I. = 0 \]
\[ C.R. = 0 \leq 0.1 \]

Judgment matrix has consistency.

The weight set of factors A5 = (0.6, 0.2, 0.2).

The indexes of environmental indicators include labor working environment, environmental sustainability, these two indicators, according to the hierarchy shown in Table 1, and organize comments relevant experts, the calculation results are summarized in Table 3-7.

\[ \lambda_{\text{max}} = 2 \]
\[ n = 2 \]
\[ C.I. = 0 \]
\[ C.R. = 0 \leq 0.1 \]

Judgment matrix has consistency.

The weight set of factors A6 = (0.5, 0.5).
Table 3-8 Index weight at all levels of Uniqlo fabric supplier selection

<table>
<thead>
<tr>
<th>First grade indicators</th>
<th>Second grade indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicators</td>
<td>Index</td>
</tr>
<tr>
<td></td>
<td>weight</td>
</tr>
<tr>
<td>Quality ability A1</td>
<td>0.3975</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Production skills A2</td>
<td>0.2306</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Price level A3</td>
<td>0.1711</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Market sensitivity A4</td>
<td>0.1119</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Delivery capacity A5</td>
<td>0.0583</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental index A6</td>
<td>0.0306</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Using Table 3-8, we can get the classification indexes weights of Uniqlo fabric supplier selection. According to previous calculation, the consistency ratio is less than 0.1. It can be seen, the indicators meet the consistency check.

IV. Empirical analysis

4.1 Using technique for Order Preference by Similarity to an Ideal Solution (TOPSIS) to select supplier

Three companies including Shenzhou International Group Holdings Limited, JIFA Group in Qingdao, Fujian Changle Jinyuan Textile Co.,Ltd are selected as examples to carry out empirical analysis of Uniqlo fabric supplier selection.

4.1.1 The structure of decision matrix

Set Uniqlo fabric suppliers that be assessed as Ci (i = 1,2,3, ..., m), and m is the number of suppliers that need to be chosen. Assessment indicators is Bj (j = 1,2,3, ..., n). Then, set up the program set C = {C1, C2, C3, ..., Cm} for the index set B = {B1, B2, B3, ..., Bn} to evaluation value Xij (i = 1,2,3, ..., mi j = 1,2,3, ..., n), configured to decision matrix X. According to the actual situation of the respective companies and Table 4-1, the three companies were scored, including Shenzhou International Group Holdings Limited for the A1, JIFA Group for the A2, Fujian Changle Jinyuan Textile Co.,Ltd for the A3, as shown in table 4-1.
### Table 4-1 Supplier rating

<table>
<thead>
<tr>
<th>Feature</th>
<th>A₁</th>
<th>A₂</th>
<th>A₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate of qualified products B₁</td>
<td>5</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Quality improvement ability B₂</td>
<td>5</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Quality system B₃</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Productivity advantage B₄</td>
<td>5</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Technological level B₅</td>
<td>4</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>R&amp;D ability B₆</td>
<td>5</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Product costs B₇</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Cost control ability B₈</td>
<td>4</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Information processing capability B₉</td>
<td>5</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Product improvement cycle B₁₀</td>
<td>5</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Delivery punctuality B₁₁</td>
<td>5</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Sample timely B₁₂</td>
<td>5</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Emergency order processing ability B₁₃</td>
<td>4</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Working environment of labor B₁₄</td>
<td>5</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Environmental sustainability B₁₅</td>
<td>5</td>
<td>5</td>
<td>4</td>
</tr>
</tbody>
</table>

According to Table 4-1, decision matrix X can be obtained as follows:

\[
\begin{array}{ccc}
5 & 5 & 4 \\
5 & 4 & 3 \\
5 & 5 & 5 \\
5 & 4 & 3 \\
4 & 5 & 3 \\
5 & 5 & 3 \\
3 & 4 & 5 \\
\end{array}
\]

\[
X = \begin{array}{ccc}
4 & 4 & 5 \\
5 & 4 & 3 \\
5 & 4 & 3 \\
5 & 5 & 4 \\
5 & 4 & 3 \\
4 & 4 & 3 \\
5 & 5 & 4 \\
5 & 5 & 4 \\
\end{array}
\]

#### 4.1.2 Dimensionless decision matrix

The data of decision matrix X is more complex, dimensions are not unified. We need to use formula 4-5 to standardize
process for relevant data of decision matrix, so that the decision matrix dimension is harmonized and finally won the decision matrix $X$:

$$
\begin{align*}
\begin{bmatrix}
1 & 1 & 0 \\
1 & 0.5 & 0 \\
0 & 0 & 0 \\
1 & 0.5 & 0 \\
0.5 & 1 & 0 \\
1 & 1 & 0 \\
0 & 0.5 & 1 \\
0 & 0 & 1 \\
1 & 0.5 & 0 \\
1 & 0.5 & 0 \\
1 & 1 & 0 \\
1 & 0.5 & 0 \\
1 & 1 & 0 \\
1 & 0.5 & 0 \\
1 & 1 & 0 \\
1 & 1 & 0 \\
\end{bmatrix}
\end{align*}
$$

4.1.3 Construct the weighted decision matrix and calculate the positive and negative ideal solution

After standardization and regulation of the indicators of the three options, we come up with positive and negative ideal solution for each scenario and make these solutions as the final results. Weighted decision matrix and negative ideal solution are shown as Table 4-2:
4.1.4 Calculate the Euclidean distance and relative closeness degree

By calculating the Euclidean distance value of positive ideal solution and negative ideal solution and the three companies, we ultimately determine the closeness between three companies and optimal solution. The size of $\eta_i$ value represents the degree of near-optimal solutions, the greater the value of $\eta_i$, i.e., the closer to best solution and the better the program. The results after calculating the parameters of three companies are shown as Table 4-3:

<table>
<thead>
<tr>
<th>suppliers</th>
<th>the positive ideal solution of Euclidean distance</th>
<th>the negative ideal solution of Euclidean distance</th>
<th>$\eta_i$</th>
</tr>
</thead>
<tbody>
<tr>
<td>A₁</td>
<td>0.1440</td>
<td>0.2876</td>
<td>0.6664</td>
</tr>
<tr>
<td>A₂</td>
<td>0.1313</td>
<td>0.2390</td>
<td>0.6454</td>
</tr>
<tr>
<td>A₃</td>
<td>0.2948</td>
<td>0.1353</td>
<td>0.3146</td>
</tr>
</tbody>
</table>

4.2 Analysis Vendor Selection

According to the method of TOPSIS, we calculate the value of relative closeness and sort the final evaluation of these suppliers, as shown in figure 4-4.
According to Table 4-4 and 4-1, both the results of Shenzhou International Group Holdings Limited and the JIFA Group are more close to Euclidean distance value of positive ideal solution, while the result of Fujian Changle Jinyuan Textile Co., Ltd has a certain gap. From the aspect of Euclidean distance values of negative ideal solution, there is a greater closeness in Changle Jinyuan Textile Co., Ltd. than in two other companies. We can see from the final results that the Shenzhou International Group Holdings Limited is the closest one to the best suppliers, the JIFA Group is the second closest and Changle Jinyuan Textile Co., Ltd. is the least closest.

After the aforementioned calculation, we can get the final result in the order given.

Shenzhou International Group Holdings Limited > the JIFA Group > Changle Jinyuan Textile Co., Ltd

Figure 4-5 is the bar chart of the weight of first grade indexes in Uniqlo fabric supplier selection which is determined by AHP. The first grade indicators are sorted as: quality capability > production skills > price level > market sensitivity > delivery capacity > environmental indicators. Among them, the weights of the quality of capacity, production skills, price level and market sensitivity are big, respectively 39.75%, 23.06%, 17.11% and 11.19%, with the sum more than 90%. The result is consistent with the operation principle of Uniqlo and the characteristics of SPA model. In this paper, index system is in line with the development needs of Uniqlo stage, which is rational to some degree.
The Shenzhou International Group Holdings Ltd has obvious advantages in quality, productivity and market sensitivity based on the analysis of Chapters III and IV of this article. The company can meet the requirements of high quality, high productivity, and fast market reaction in Uniqlo. Cost control, however, needs improvement. Uniqlo need to be able to provide a large number of low-cost high-quality products. In reality, the company is one of the earliest Chinese fabric suppliers of Uniqlo, it continues to improve its own production features to achieve high standards to meet Uniqlo’s requirements in cooperation.

Although the JIFA Group has full advantages in product quality and R & D capability, it is still way behind Shenzhou International Group under the professional requirements of rapid response of International SPA like Uniqlo,. In future, the company needs to improve its capacity in market demand and information transfer. Recently, the company began to cooperate with Uniqlo in the fabric supply for and became more familiar with Uniqlo’s fabric standards.

There is a obvious gap between Changle Jinyuan Textile Co., Lt and other two companies based on the calculation. Although the company has certain advantages in product costs and environmental indicators, its quality and production processes which Uniqlo most valued do not meet the standards. In the future, the company should continue to expand their production and control the quality strictly. It should also invest more in product development. In fact, the company is improving their product quality and production skills for early accession to the International SPA chain procurement network.

In summary, Uniqlo fabric supplier selection model which is constructed in this paper is roughly correspond to Uniqlo supplier selection in reality, it is rational to some degree.

V. Conclusion

Based on strategic sourcing, SPA model, supplier selection and the present fabric suppliers of Uniqlo, this paper concerned the factors that have an impact on the selection of fabric suppliers. We established the selection and evaluation system through qualitative analysis, quantitative analysis as well as case study. Then we conduct an empirical analysis of the evaluation system.

1. Raw material suppliers should response quickly to meet the demands of consumers for the speed that plays a vital role in the SPA model used by Uniqlo. This paper summarized six principles and fifteen operational levels to assure the fabric suppliers to be chosen that can response quickly and is fashionable. Capacity, production skills, price level are important among all the principles.
2. Faced with the competition from international SPA enterprises, Uniqlo must increase its core competitive power. Uniqlo needs a larger number of suppliers in the future to be less reliant on some certain suppliers, so that the suppliers can react faster. Meanwhile, Uniqlo can raise product quality through building strategic alliances with suppliers.

3. Companies in China can learn a lot from the SPA model of international enterprises. Local clothing brands should increase the capacity of independence innovation and establish a supply-chain with quick response to build our own SPA model. Textile business in China should consider the standards of Uniqlo's fabric supplier collection to help them join in the Uniqlo's procurement network.

References
Zhiming Zhang, Jiasu Lei, Ning Cao, Kinman To, Kengpo Ng. Evolution of Supplier Selection Criteria and Methods[M], WorkingPaper.