LONG-TERM SUPPLY CHAIN DEMAND MANAGEMENT: A STRATEGIC FACTOR FOR SUSTAINABLE SUCCESS

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Hella Abidi*
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1. Introduction
2. Collaborative forecasting planning process
3. Analytical network process
4. Research results
5. Conclusion
1. Introduction

- Sudden and spontaneous developments push companies to adapt trends quickly
- Success key elements like financial resources, production technology or economies of scale undergo a shift to include the companies’ ability to adapt and to initiate strategic change
- Long-term demand planning process that monitors environmental changes and draws the right conclusion to improve a company’s strategic position
- Most companies’ do not spend time or money in enhancing the long-term demand planning process
  - Challenges in supply chain demand management
  - Demand management is key to sustainable success of a supply chain
2. Collaborative forecasting planning process

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**Supplier**
- Forecasting Management
  - Long-term
  - Mid-term
  - Short-term

**Manufacturer**
- Forecasting Management
  - Long-term
  - Mid-term
  - Short-term

**Retailer**
- Forecasting Management
  - Long-term
  - Mid-term
  - Short-term

- **Strategy**
- **Planning & Operation**
- **Marketing**
- **Sales**
- **Product Development**
- **etc.**

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Forecasting information

Confirmation
3. Analytical network process

- Extension of analytical hierarchy process
- Multi Criteria Decision Making (MCDM) method for complicated and unstructured problems
- Solve multiple qualitative and quantitative criteria problems in a network process
- allows groups or individuals to deal with the interconnections (dependence and feedback) between factors of complex structure in decision making process
3. Analytical network process

- Pair-wise comparison of criteria based on a fundamental scale
- Convert individuals preferences into ratio scale weights
- Fulfillment of 4 axioms
  - Reciprocal condition
  - Homogeneity
  - Dependence
  - Integrity

<table>
<thead>
<tr>
<th></th>
<th>Equal Importance</th>
<th>Two activities contribute equally to the objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Weak Importance</td>
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<tr>
<td>3</td>
<td>Moderate Importance</td>
<td>Experience and judgment slightly favor one activity over another</td>
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<td>4</td>
<td>Moderate plus</td>
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<tr>
<td>5</td>
<td>Strong Importance</td>
<td>Experience and judgment strongly favor one activity over another</td>
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<td>6</td>
<td>Strong plus</td>
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<tr>
<td>7</td>
<td>Very Strong or demonstrated Importance</td>
<td>An activity is favored very strongly over another; its dominance is demonstrated in practice</td>
</tr>
<tr>
<td>8</td>
<td>Very, very strong Importance</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Extreme Importance</td>
<td>The evidence favoring one activity over another is of the highest possible order of affirmation</td>
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4. Research results

- Identification of the selection criteria and alternatives
- Construction of the ANP model
  - Create and form a hierarchical network with overall objectives and criteria to present relationship between different level
- Calculation of rankings of alternatives

Problem formulation

Identification and classification of selected criteria

Identification criteria/alternatives interdependence

ANP model construction

Pair-wise comparison to determine criteria priorities

Pair-wise comparisons to determine alternative priorities with respect to each criterion

Determine overall priority for each alternative

Select alternative with the highest priority
4. Research results

Goal
- Long-term demand management

Criteria
- Expert knowledge
- Mathematical models
- Information sharing with immediate suppliers & customers
- Accuracy
- Cost efficiency
- Manageability
- Understandability
- Flexibility
- Performance measurement
- Integration into short- & midterm demand management process
- IT-support

Alternatives
- Cost
- Quality
- Usability

Goal
- Long-term demand management

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Alternatives
- Cost
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# 4. Research results

## What industry does your company belong to?

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<tbody>
<tr>
<td>Sector</td>
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<td>Transportation</td>
<td>Energy</td>
<td>Energy</td>
<td>Transportation</td>
<td>Chemical</td>
<td>Energy</td>
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## How large is your company?

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<tr>
<td>&gt;500 employees</td>
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## Relevance

<table>
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<tr>
<th>Accuracy of the long-term demand management</th>
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<tr>
<td>Relevance</td>
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<td>7.5</td>
<td>6</td>
<td>4</td>
<td>5</td>
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<td>Average</td>
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## 4. Research results

### a. Demand predictability < 3 years

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### b. Demand predictability > 3 years

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### c. How would you describe the demand volume for your company with regard to the next 3 years

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</thead>
<tbody>
<tr>
<td></td>
<td>high volume</td>
<td>high volume</td>
<td>high volume</td>
<td>low volume</td>
<td>high volume</td>
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### d. How would you describe the demand volume for your company with regard to a time horizon > 3 years

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<td>low volume</td>
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</table>
4. Research results

- Referring to the aspect 'usability': Integration into short-term and midterm demand management process, IT support, manageability, mathematical models and understandability are most important.

- Referring to the preference 'quality': Information sharing with immediate suppliers and customer, integration into short-term and midterm demand management process, understandability are most important.

- Referring to the preference 'costs': Usability, flexibility, information sharing with immediate suppliers, understandability and manageability are of high relevance.

- Requirements such as expert knowledge, cost effectiveness, IT-support are less important compared to other requirements.

- The raw values are directly adapted from the super matrix.

- The ideal values are the raw values multiplied by the cluster weight.

- The normal values are obtained by normalizing ideal values as to sum up to 1.
5. Conclusion

- Research showed that the most important factor for a long-term demand plan is its usability
  - 42% of the supply chains are of the lean type
  - 14% of the supply chains are of the agile type
  - 28% of the supply chains are of the hybrid type
- The strategic importance of the long-term demand process is firmly integrated into the companies mind set
- Demand planning on a strategic basis is equally important to companies as for example short term demand optimization
- Costs do not seem to play an important role when designing the long-term demand plan
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Thank you for your attention!

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