Sustainable Supply Chain
Function Deployment

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Hamburg-Harburg
1. Introduction
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1. Introduction

- Increasing interest for sustainable supply chain management in the last years
- More and more companies illustrate the three-dimensions-approach via internet
- Supply chain management is a holistic approach
- Main objective is to realize customer satisfaction
- A method in quality management to increase customer satisfaction is the quality function deployment

Research-question: Is it possible to apply the quality function deployment for a sustainable supply chain management approach?
2. Sustainable Supply Chain Management

- Different definitions in literature are given
- Usually many definitions consider the ecological, economical and social perspectives
- In our understanding one factor is important too: Education!
Drivers for sustainable supply chain management are

- **Internal**
  - Warranty
  - Service and repairs
  - Product return and recovery
  - Claims and recalls
  - Remanufacturing

- **External**
  - Customers
  - Environment
  - Financial
  - Legislation
3. Quality Function Deployment

- QFD is a tool to identification costumers requirements
- 1966 developed by Akao and implemented by Bridgestone
- In Europe applied by Ford and Kodak in the late 1980s
- To meet the costumer requirements manufacturers and scientists use different approaches
- Possible to consider factors like social and ecological
- In 1990s first sustainable approach in literature can be found
3. Quality Function Deployment

- QFD-Phases in supply chain management:

  1. **Product Planning**: Exactly description of customer requirements and requirements of product and supply chain performances

  2. **Product & SC Design**: Product and SC design with environmentally friendly and social performance requirements

  3. **Intra-& Inter-Organizational Process Planning**: Description the requirements on equipment and supply chain processes

  4. **Production & SC Operation**: Control phase for operative implementation of define equipment & processes parameters
3. Quality Function Deployment

- QFD-Design for sustainable supply chain function deployment

Correlation matrix

How do we meet the requirements of product and supply chain?

Relationships
(How’s to what)
Examples for sustainable supply chains:

Economical:
- Competitive prices
- Efficient processes
- Transparency and flexibility in SC

Ecological:
- Environmentally friendly product & SC-Design
- Reduction of emissions

Social:
- Fair conditions
- Employee protection
- Work life balance

Customer assessment
comparison and bench-marking to other supply chains

How much do we want to achieve product and supply chain requirements?

What?
Demand for Economical Ecological Social
### 4. Sustainable Supply Chain Function Deployment

<table>
<thead>
<tr>
<th>Direction of Improvement</th>
<th>Supply Chain Management Processes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Procurement</td>
</tr>
<tr>
<td>Customer Requirements (What)</td>
<td></td>
</tr>
<tr>
<td>Logistics</td>
<td></td>
</tr>
<tr>
<td>Flexibility</td>
<td>1</td>
</tr>
<tr>
<td>Quality</td>
<td>9</td>
</tr>
<tr>
<td>Safety</td>
<td>1</td>
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<tr>
<td>Transparency</td>
<td>1</td>
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<tr>
<td>Reduce</td>
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<tr>
<td>Costs</td>
<td>9</td>
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<tr>
<td>Emissions</td>
<td>1</td>
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<tr>
<td>Pollutions</td>
<td>1</td>
</tr>
<tr>
<td>Social</td>
<td></td>
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<tr>
<td>Fair Conditions</td>
<td>3</td>
</tr>
<tr>
<td>Compliance</td>
<td>3</td>
</tr>
<tr>
<td>Rating</td>
<td></td>
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</tbody>
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1 = Weak correlation
9 = Strong correlation
4. Sustainable Supply Chain Function Deployment

- Sustainable supply chain function deployment illustrates that
  - Supply chain processes have to be considered by product planning
  - Existing processes have to be changed for a sustainable approach

<table>
<thead>
<tr>
<th>Before / today</th>
<th>After / in future</th>
</tr>
</thead>
<tbody>
<tr>
<td>JIT/JIS-concepts</td>
<td>Bundling orders</td>
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<tr>
<td></td>
<td>Central warehouses</td>
</tr>
<tr>
<td>Global sourcing</td>
<td>Local sourcing</td>
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<tr>
<td>Production in cheap wage countries</td>
<td>No child labor</td>
</tr>
<tr>
<td>Non-compliance legal driving hours</td>
<td>compliance legal driving hours</td>
</tr>
<tr>
<td>Direct delivery concepts</td>
<td>Bundling delivery concepts</td>
</tr>
<tr>
<td>Each company distribute themselves</td>
<td>Collaborative distribution</td>
</tr>
</tbody>
</table>
5. Conclusion

- Application of QFD is possible in SCM
- Helpful tool to meet customer and supply chain requirements
- Benchmarking with other supply chains is feasible
- Sustainable supply chain function development illustrates trade-offs before designing products and supply chain processes
- Method illustrates the complexity of supply chains in practice too
- Coordinated and cooperative approaches are essential to realize a sustainable supply chain management
- **Customer have to want a sustainable approach!** (Basics of each supply chain is the costumer)
Sustainable Supply Chain

Function Deployment

Thanks for your attention!

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