Uncertainty supply chain model and transport in its deployments

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**Research Problem:**
Considering the Matrix of Uncertainty Supply Chain Model: how transportation fits and supports global competition of these matrices and subsidiaries, since the source of raw material supply is far from manufacturing industry?

**Keywords:** Uncertainty Supply chain Model, Agile supply chain; Manaus industrial pole; logistics, transport.
Introduction
This article discusses the Uncertainty Model of Supply Chain, and proposes a matrix with their transportation modes best suited to their chains.

From the detailed analysis of the matrix of uncertainty, it is suggested transportation modes best suited to the management of these chains, so that transport is the most appropriate optimization of the gains previously proposed by the original model, particularly when supply chains are distant from suppliers of raw materials and / or supplies.

Here we analyze in detail Agile Supply Chains, which is a result of Uncertainty Supply Chain Model, with special attention to Manaus Industrial Center. This research was done at Manaus Industrial Pole, which is a model of industrial agglomerations, based in Manaus, State of Amazonas (Brazil), which contemplates different supply chains and strategies sharing same infrastructure of transport, handling and storage and clearance process and uses inbound for suppliers of raw material.
The state of art contemplates supply chain management, uncertainty supply chain model, agile supply chains, Manaus Industrial Center (MIC) and Brazilian legislation, as a business case, and presents concepts and features, of each one.

The main goal is to present and discuss how transport is able to support Uncertainty Supply Chain Model, in order to complete management model.

The results obtained confirms the hypothesis of integrated logistics processes are able to guarantee attractivity for industrial agglomerations, and open discussions when the suppliers are far from the manufacturer center, in a logistics management.
Methodology

• Business Case using Manaus Industrial Pole (MIP)
  
  • MIP is an industrial clustering which includes approximately 600 different national, multinational and global industries, sharing the same infrastructure of transport.
  
• Two different supply chains of each strategy were followed to identify their main transport mode and suggest based on data obtained, which mode would be the best.
# The Uncertainty Matrix

<table>
<thead>
<tr>
<th>Uncertainty of Supply</th>
<th>Uncertainty of Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low (Stable Process)</td>
<td>Low (Functional Products)</td>
</tr>
<tr>
<td></td>
<td>Candies, basics, common apparel, foodstuffs, oil and gas</td>
</tr>
<tr>
<td>High (Development Process)</td>
<td>High (Innovative Products)</td>
</tr>
<tr>
<td></td>
<td>Fashion apparel, computers, audio, video</td>
</tr>
<tr>
<td></td>
<td>Hydroelectric apparatus, some food segments</td>
</tr>
<tr>
<td></td>
<td>Telecom, high-end computers, semi-conductors</td>
</tr>
</tbody>
</table>

*Source: Aligning Supply Chain Strategies with Product Uncertainties: Lee, 2002*
<table>
<thead>
<tr>
<th>Uncertainty of Supply</th>
<th>Supply Chain Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low (Stable Process)</td>
<td>Efficient Supply Chains</td>
</tr>
<tr>
<td>High (Development Process)</td>
<td>Sensitive Supply Chains</td>
</tr>
<tr>
<td></td>
<td>Supply Chains with Risk Coverage</td>
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<tr>
<td></td>
<td>Agile Supply Chains</td>
</tr>
</tbody>
</table>

*Source: Aligning Supply Chain Strategies with Product Uncertainties: Lee, 2002*
Matrix Model Suggested:

<table>
<thead>
<tr>
<th>Uncertainty of Supply</th>
<th>Supply Chain Strategies and Transport</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low (Stable Process)</td>
<td>Efficient Supply Chains (Sea Transport)</td>
</tr>
<tr>
<td>High (Development Process)</td>
<td>Sensitive Supply Chains (Sea-Air Transport)</td>
</tr>
<tr>
<td></td>
<td>Supply Chains with Risk Coverage (Sea Transport)</td>
</tr>
<tr>
<td></td>
<td>Agile Supply Chains (Air Transport)</td>
</tr>
</tbody>
</table>

*Source: Aligning Supply Chain Strategies with Product Uncertainties: Lee, 2002*
Conclusion

The difficulty in supply chain management for the representatives in the Uncertainty Model was the reason for this article, which sought to discuss how transport could be adapted the Uncertainty Supply Chain Model and how it would help to develop MIC to be a global competitor even far from supply basis, for example west versus east.

In this sense, air transport is a fundamental pre-requisite for attending the supply chains in the uncertainty model, for innovative products which are 45% of total revenue for this model.

It needs to have an improved infrastructure and guarantee the agility and attractiveness of this model of high aggregated technology also in the Manaus Industrial Center (MIC).

With the MIC being one of the foremost export centers in Brazil, there is a need to improve the services and infrastructure for air transport as a fundamental support for developing high technology production and, consequently, products on the cutting edge of technology, which could contribute greatly to the level of Brazilian exports, given their high aggregated value.
References:

Thank you!

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