Global Supply Chain Optimisation
By Using Sensing Solutions

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Traditional supply chain structures no longer fit today's turbulent, complex, and volatile world. Supply chain visibility, enabled by digital technologies, is therefore required to reduce the vulnerability of supply chains and allow an easier bounce back from disruptions.

Background

The recent global events have disrupted supply chains heavily, affecting both organisations and consumers. The disruptions affected everything from consumer goods shortages, such as hand sanitiser, to semiconductor shortages and their implications for manufacturing industries. These disruptions led to an imbalance between supply and demand, driving up costs for both organisations and consumers. To mitigate these effects, it's crucial to have better visibility into the entire supply chain and the ability to quickly adapt to changes in demand.
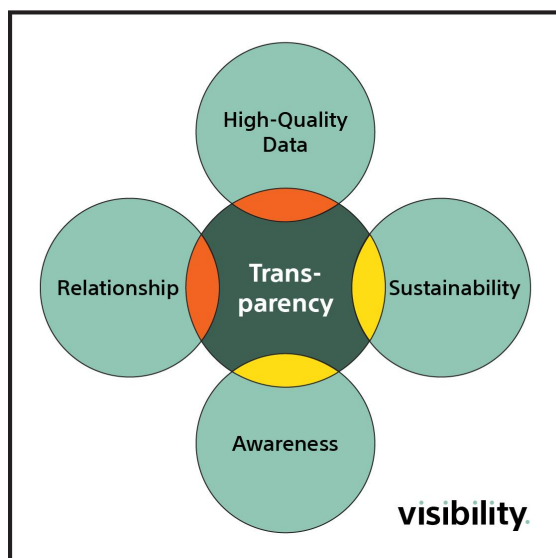
Visibility Factors

The project's results indicate that digital technologies enable better visibility in the global supply chain. It also demonstrates that visibility is mainly affected by transparency. Transparency is, in turn, interrelated to four other factors as the research showed. These factors are referred to as dimensions by the authors, which are (1) High-quality data, (2) Relationship, (3) Awareness, and (4) Sustainability. The authors identified these dimensions to categorise the opportunities brought by better visibility. The dimensions make the opportunities more

manageable to collaborate with. Some of the opportunities brought by the dimensions include enhanced decision-making, increased collaboration, optimised route planning, and minimised CO_2 emissions.

Visibility Model

After identifying what factors are needed to enable better visibility, a model referred to as the visibility model has been developed, see figure 1 below. The model emphasises the importance of visibility and its interconnection with the other identified factors. The model illustrates that visibility is the frame for all the factors. Transparency is set as the core as it plays a crucial role in the visibility and the four dimensions. Further, the model illustrates two different types of transparency, i.e., ex-ante and ex-post. Ex-ante refers to the dimensions that come in the early stage, whereas ex-post refers to the dimensions that come after achieving a certain level of transparency.

Figure 1: The visibility model (authors)

Objective

The objective of this project is to identify and study the opportunities for supply chain visibility that are offered through adopting sensing solutions. The project investigates how Visilion meets the market needs and provides recommendations for future developments of Visilion's solution. Studying this topic contributes to a better understanding of a widely used term in the supply chain, i.e., visibility. Further, as visibility has conceptual characteristics, meaning it is hard to measure its improvements, the visibility model can be used by organisations to make tangible changes in each dimension to improve their visibility.

Supply Chain 4.0

The project connects different supply chain topics, i.e., supply chain resilience, visibility, transparency, and technology. All these areas were considered from the fourth industrial revolution perspective and how technology can help enable real-time visibility as well as a quicker revolution in the supply chain. The supply chain revolution and the digital transformation are referred to as supply chain 4.0, which is the industry 4.0-adapted supply chain. The sensing solutions that Visilion is developing are key in enabling supply chain 4.0. The introduced visibility model creates a strong connection between the four identified dimensions. This model illustrates the interdependence and the correlation between the various dimensions of visibility and transparency.

Implementation

This project can be used in future studies of supply chain visibility and what effect sensing solutions have on it. Additionally,

it can be used to find literature on the topics discussed where the theoretical platform links those different topics together from several sources. Moreover, the result of this project can be used by Visilion to develop the product further. The results also present the underserved needs based on the theoretical platform and empirical findings. Last but not least, the result shows that Visilion's solution addresses almost all the identified market needs despite some underserved needs that can be considered as future development.

Approach
The research approach of the project is an exploratory single-case study methodology, and the data is collected through an abductive approach. Further, the data is obtained through expert interviews and literature reviews, both academic and practitioner literature, and analysed using pattern matching and product-market fit analysis.