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SUPPLY CHAIN EVOLUTION

Stakeholder Requirements for Supply Chain Viability

Report 1

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The Need for Purposeful Supply Chain Management

Climate change, geopolitical tensions, and unforeseen events increasingly disrupt global supply chains while our economic and ecological systems reach more and more their limits. In this context, purposeful supply chain design is essential to manage volatility and ensure responsible resource use.

The Concept of Supply Chain Viability (SCV)

To manage these challenges, it is crucial to understand the relationships and synergies between three target dimensions: efficiency, resilience, and sustainability[1,2]. An integrated approach, known as Supply Chain Viability (SCV), was introduced by researchers Ivanov and Dolgui in 2020[3].

Balancing the Three Target Dimensions

Focusing exclusively on one of these dimensions is neither effective nor realistic. Companies must consider all three dimensions simultaneously and harmonize them. To illustrate the need for a sweet spot, some examples:

> *Overemphasizing cost efficiency* may leave companies vulnerable to supply chain disruptions, resulting in delays and financial losses.
>
> *Prioritizing resilience* (e.g., by maintaining high inventory levels) to be prepared for disruptions can increase storage costs and reduce profitability.

Thus, achieving the right balance between efficiency and resilience is essential for long-term success. Additionally, integrating sustainability as a third dimension ensures compliance with environmental and social standards, which is crucial for a supply chains long-term viability.

Identifying Stakeholder Requirements as the First Step towards Viability

To optimize SCV, it is essential to understand the expectations and requirements placed on the company by stakeholders, both internally (e.g., shareholders or top management) and externally (e.g., customers or regulations). Identifying and balancing these requirements serves as a foundational step toward achieving SCV[4,5].

Getting Started with Supply Chain Viability: Your Guideline to Identify Stakeholder Requirements

This guideline will help you to identify SCV stakeholders and their specific requirements. The results are based on exploratory and qualitative research as part of our innovation project. The research approach combined an extensive literature review with expert interviews from various stakeholder groups (consulting and services, value creation, logistics service providing, regulatory affairs, and society) between December 2023 and March 2024. The results were presented to a panel of experts, who reflected and reviewed them with the research team.

The derived procedure can be divided into four phases, which are divided into eight steps. The first phase analyzes the supply chain and its surrounding environment. The second phase focuses on identifying and prioritizing key stakeholders. The third phase outlines stakeholder requirements, ranks their importance, and lastly, the fourth phase presents key conclusions.

Analysis of the Supply Chain and Its Environment

Building a Team and Defining the Scope

Create a cross-functional team with people from supply chain management, logistics, sourcing and procurement, quality management, marketing, finance, environmental sustainability, IT, sales/customer support, and production. Bring in roles from different age groups and levels of experience.

Decide which areas, product lines, or departments will be included in the analysis. Small and medium-sized enterprises (SMEs) usually consider the entire organization, but you can focus on specific parts if needed.

Analyzing the Supply Chain Environment

Conduct a PESTEL analysis with your team. Focus the analysis entirely on your supply chain. In the PESTEL analysis (political, economical, sociocultural, technological, ecological, and legal), you try to understand the macroeconomic environment affecting your supply chain.

Evaluate how political changes, trade agreements, or tariffs could affect your supply chain. Analyze economic trends, inflation, or growth affecting costs and availability. Research demographic changes, consumer trends, or social movements influencing demand.

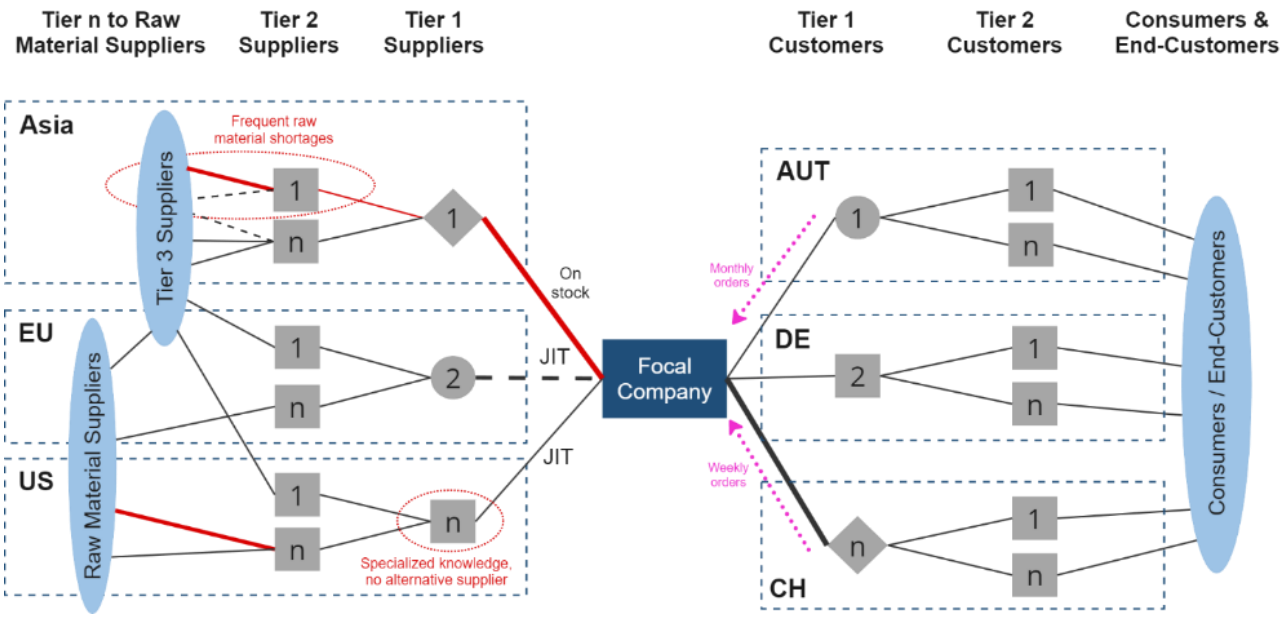
Assess the impact of new technologies on your supply chain and the potential linkages to the SCV dimensions. Evaluate environmental aspects such as sustainability standards or carbon footprint. Lastly, check the impact of legal requirements and laws relevant to your supply chain.

Developing a Supply Chain Map

Create a supply chain map based on the defined scope. Focus on the most essential parts of your supply network. Choose a tool like Microsoft Visio or MIRO. If you have advanced IT skills, you may build up a database and can use R or Python with iGraph, Neo4j, or NetworkX. However, start simple, and do not initially make your map too complicated. The goal is to incrementally expand your understanding of your network.

Figure 1 illustrates an example map of a Supply Chain Network. Your map could include companies and suppliers, key technologies, and capabilities affecting your supply chain, like just-in-time delivery for specific parts. Place your company at the center of the map and use different symbols for each entity.

Figure 1
Sample Supply Chain Map



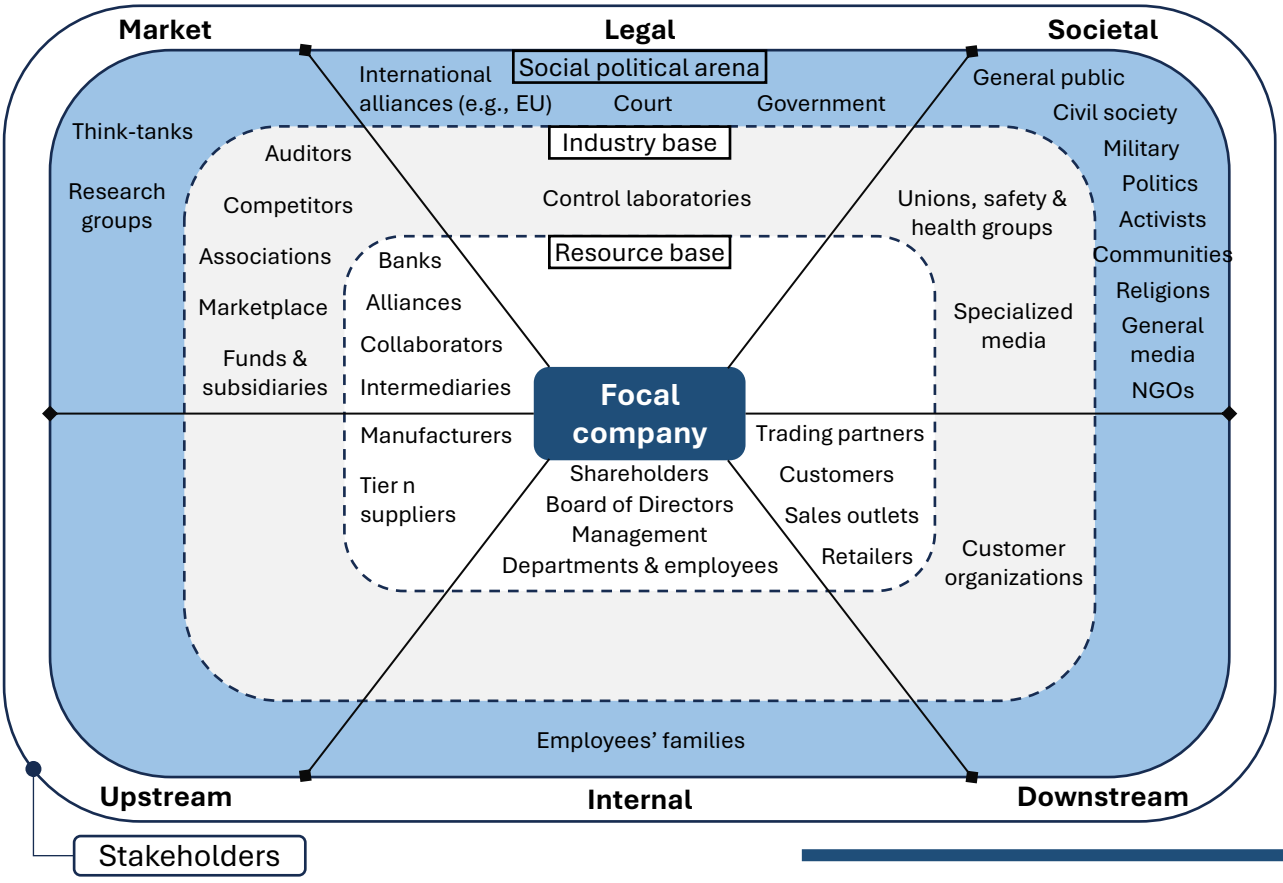
You can detail multiple tiers, like tier-2 suppliers, down to raw material suppliers and group entities by location, show material and information flow, and highlight critical points and bottlenecks. There is also the opportunity to map risk levels, such as political stability and natural disasters, and include production or delivery capacities with key performance indicators (KPIs) and thresholds or target values. Additionally, you can show required compliance or certifications and transportation routes and modes. In your map, highlight important nodes by making their symbols larger to indicate bigger companies or higher market shares. Use wider lines to show important transactions or information flow. Use different colors or symbols to represent network communities and their membership[6,7,8].

Stakeholder Identification and Prioritization

Identifying Key Stakeholders

Brainstorm and list all potential stakeholders that could impact your supply chain or have a special relationship with it. Note their primary interests in efficiency, resilience, sustainability, and influence on your supply chain.

Figure 2
Supply Chain Stakeholder Map



The Stakeholder Map[9,10] in Figure 2 can guide your discussion, alongside the results of the PESTEL analysis and supply chain map, which will serve as the basis for identifying your key stakeholders. The Stakeholder Map is grouped into six classes. Upstream stakeholders are those who contribute to creating a product. Internal stakeholders are those directly involved in the company's operations and decision-making processes, while downstream stakeholders use your products or services. Market stakeholders are the entities you interact with within the marketplace and can affect your performance. Legal stakeholders establish the regulatory framework within which your company operates, and societal stakeholders represent societal interests and concerns related to your company's impact on society and the environment[11,12,13].

Prioritize your Stakeholders

First, assess the level of interest as high, medium, or low for all identified stakeholders. Second, evaluate their influence or power over your company and supply chain, including their ability to impact decisions or activities.

Review the list and determine which stakeholders are most important to collect detailed requirements. Based on the findings, prioritize at least these stakeholders for further investigation: Tier 1 suppliers, shareholders and investors, board of directors, top management, customer organizations, and end customers. Check at least marketplace and industry expectations, industry associations, leading competitors, laws and regulations, government agencies, safety and health groups, financial institutions if applicable, and NGOs related to your use case.

Identification and Prioritization of Requirements

Explore Common Stakeholder Requirements

The innovation project identified the most frequently mentioned stakeholder requirements. You can find them in Figure 3. These requirements are grouped by stakeholder categories, and the letter within the brackets ([E] for efficiency, [R] for resilience, and [S] for sustainability) indicates the dimension to which each requirement is linked. Check those to get an initial understanding. Keep in mind that the standardized requirements are just a first direction. They might be very specific in your context[14,15,16,17].

Figure 3
Stakeholder Requirements for Supply Chain Viability

From Legal Stakeholders

- Financial health [E]
- Legal compliance & certification [S]
- Social responsibility & health/safety assurance [S]

From Societal Stakeholders

- Transparency in operations [E]
- Sustainability accountability by external pressure [S]
- Environmental impact reduction [S]
- Social responsibility & ethical standards [S]

From Market Stakeholders

- Implementation of efficient machinery & technology [S]
- Resource-efficient product design [S]

From Upstream Stakeholders

- Accurate demand forecasting [E]
- Support for joint development [E]
- Risk-sharing mechanisms [R]
- Sustainability expertise [S]

From Internal Stakeholders

- Financial health & stability [R]
- Management attitude towards sustainability & future success [S]

From Downstream Stakeholders

- Consistent quality [E]
- Responsive customer service [E]
- Reliable product delivery [R]
- Product transparency [S]
- Identification with the brand [S]

Gathering Detailed Stakeholder Requirements

Now that you have a list of stakeholders and an overview of typical requirements, identify their specific requirements for efficiency, resilience, and sustainability.

Internal Data Sources

– Check company documentations and reports, such as the intranet, departmental folders, project management tools, and organizational charts, for previous stakeholder analyses or project reports.

– Look into CRM systems (Customer Relationship Management), e.g., in the sales and marketing departments, for contact details, communication history, customer feedback, and contract registers that indicate customer and partner requirements and expectations.

– Dive into ERP systems (Enterprise Resource Planning) and check logistics, purchasing, production, and finance departments for information on suppliers, logistics partners, and cost structures, providing insights into the supply chain and efficiency/sustainability requirements.

External Data Sources

- Use online databases like Statista to identify industry reports and market studies, check industry associations, and check consulting companies to find industry trends, challenges, and best practices highlighting stakeholder requirements.
- Visit libraries and online portals for specific trade journals and to find articles and studies that provide insights into new developments, regulatory changes, and industry standards.
- Check social media and forums, e.g., LinkedIn and industry forums, for discussions, comments, and posts by and about stakeholders that reflect their opinions, concerns, and requirements.

You may conduct additional surveys, questionnaires, and interviews for upstream and downstream stakeholders to gather information from relevant suppliers or customers. Engage directly on social media, use analytics tools like Hootsuite or Brandwatch, and analyze customer feedback through targeted interviews.

Engage internal stakeholders by conducting surveys or interviews, especially with top management, the board of directors, shareholders, and investors. Consider organizing a workshop for general management. Study industry reports from associations, consulting firms, and research institutions for market, legal, and societal stakeholders. Compare your processes and performance with leading companies in your industry to identify best practices, and review case studies to learn from previous experiences. Analyze websites and laws of governmental institutions and refer to consulting firms like the EQS Group for overviews of legal regulations. Determine the orientations of key NGOs, using resources like WANGO to identify important NGOs and their global directions. Study networks and platforms for activist groups and review journals and newspapers.

Prioritizing Stakeholder Requirements

For “Must-have” requirements, consider them essential for your company’s survival, as non-compliance could pose existential threats (e.g., violating laws). For example: “Our customers require that our products always meet defined quality standards to avoid risking their own production processes.”

For “Important” requirements, fulfilling them brings significant benefits to the company. Non-compliance can have severe consequences, such as losing key customers or suppliers. For example: “Our customers require fast and accurate maintenance services and spare parts, even during unexpected disruptions.”

For “Nice-to-have” requirements, while not critical, implementing them could enhance the company’s image. Non-fulfillment does not lead to severe consequences. For example: “End consumers appreciate it when we use sustainable, minimalist packaging that is easy to recycle, even if this is not a decisive factor in their purchasing decision.”

Summarize the Insights and Create a Roadmap

At this point, you have several lists with information: identified and prioritized supply chain stakeholders and their requirements, as well as new insights into your supply network (e.g., through the supply chain map, PESTEL and SWOT analysis, and new stakeholder perspectives). Summarize these insights and set priorities for the coming years. Developing a roadmap can be the first step toward defining new strategic directions.

Based on the prioritized stakeholder requirements, decide which requirements you want (or need) to meet in the future and what resources will be necessary to implement them. Include a timeline in the roadmap with short-term, mid-term, and long-term goals. Some requirements are easy to fulfill with minimal resources and can have a big impact, while others are more complex and need more resources.

Focus first on measures that offer high benefits at a low cost to achieve quick success and build momentum. Plan more challenging measures for the long term and regularly check if the necessary conditions and resources are available. In the roadmap, specify each measure's personnel, financial, and technological resources and assign these resources to the corresponding milestones and tasks.

Managerial Implications

(1) *Build cross-functional teams* with members from different departments and with various experience levels. This diversity opens multiple perspectives on both stakeholder's and company actions.

(2) *Identify synergies* and develop strategies to minimize trade-offs between efficiency, resilience and sustainability. E.g., investing in long-term supplier relationships can improve quality, supply consistency and reduce costs.

(3) *Focus on end consumer requirements*, as they are the main source of value, and their fulfillment can boost satisfaction and loyalty.

(4) *Collaborate closely with Tier-1 suppliers* as facilitators for further upstream supply chain development. Share customer requirements with them, making them close partners in achieving your SCV goals.

(5) *Use tools like CRM and ERP* to collect and analyze relevant stakeholder data. This will also support legitimacy towards top management.

(6) *Translate the insights into clear roadmaps* with long-term planning and concrete steps for compliance, capability building, and resource allocation.

Beyond the Steps in this Guide, the Following Implications can be derived:

(7) *Include short training programs for SCV* to raise awareness of SCV across all levels of the organization and to help employees understand efficiency, resilience, and sustainability and apply them in daily decisions.

(8) *Communicate the value of SCV* to internal stakeholders. Initial investments in SCV might not yield quick returns. Emphasize that the gains from a SCV often come gradually and require a long-term view.

(9) *Regularly reassess and adapt stakeholder prioritization* and their requirements to align with changing market and societal needs.

(10) *Develop competitive strategies* based on stakeholder requirements. Use the insights from stakeholder analysis to create strategies that offer competitive advantages. For smaller companies, this is crucial for standing out in the market.

Conclusions

In an unpredictable world, companies must design supply chains that are efficient, resilient, and sustainable. The supply chain viability integrates these dimensions while addressing stakeholder requirements. By identifying and prioritizing internal and external requirements, companies build a foundation for future-proof supply chains. This approach enhances competitiveness as well as legal and social standards compliance.

System understanding is crucial for resilience and sustainability. A clear view of the supply chain and its stakeholders helps uncover weaknesses and risks (e.g., through mapping). Without this, critical weaknesses and risks remain hidden. Furthermore, stakeholder engagement is key for managing disruptions. Companies that prioritize stakeholder requirements support SCV and gain long-term competitive advantages. Furthermore, sustainability should be an integral part of strategy. It strengthens resilience and competitiveness while meeting regulations and building social acceptance.

Last, digitalization and technology in supply chain development are important, but using them alone is insufficient. For SMEs with limited resources, it is crucial to understand their supply chains and identify the real issues before implementing new technologies. Rushing to adopt every new technological solution can distract from the root problems, leading to superficial improvements while fundamental weaknesses remain. Awareness is the first step; the right digital tools and strategies can be chosen.

Companies take the first step toward a more viable and sustainable future by analyzing stakeholder requirements and improving their competitiveness while contributing to a healthier planet and a fairer society.

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Looking Ahead

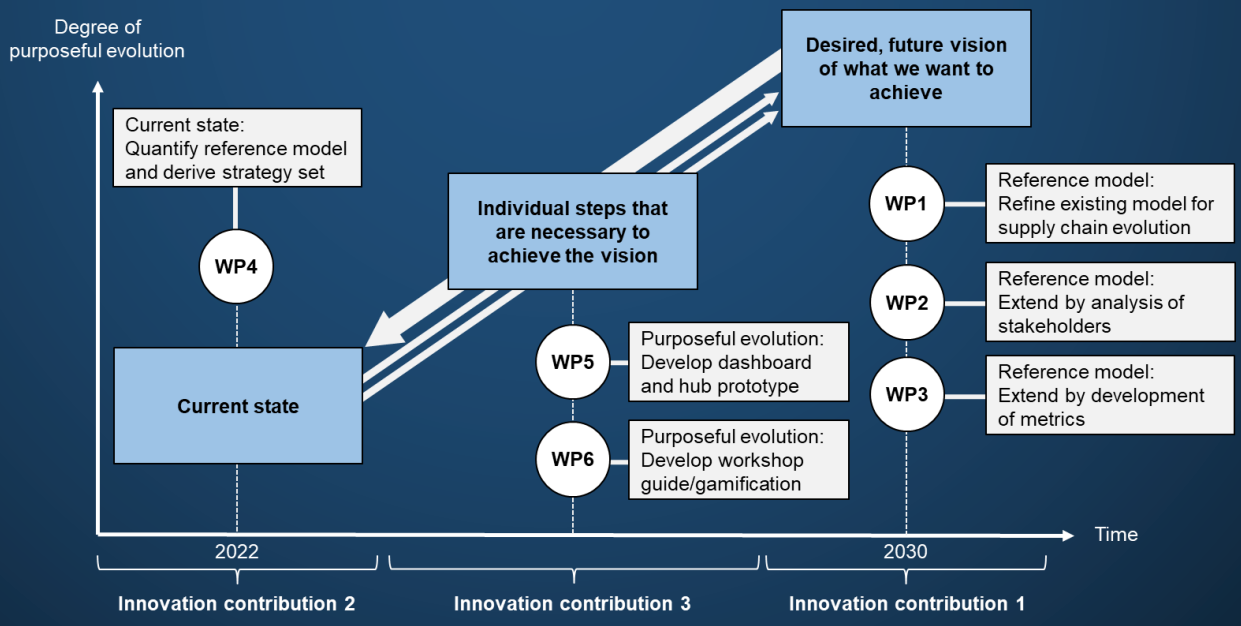
Our Innovation Contributions

Report 1, with the stakeholder analysis, lays the foundation for building viable supply chains in practice. Our innovation project uses a backcasting approach with three key innovation contributions, organized into six work packages:

Working Packages 1-3 (WP1-3) enhance the supply chain reference model, ensuring it addresses all relevant stakeholders and metrics. In addition, we analyze the tensions and synergies between the three target dimensions (efficiency, resilience and sustainability) and develop interlinked metrics.

Working Package 4 (WP4) assesses the current state of SCV by quantifying the reference model and providing best practices to help organizations improve their viability.

Working Packages 5-6 (WP5-6) focus on creating practical tools, including an SCV dashboard and workshop guides with gamification elements, to help businesses achieve and maintain supply chain viability.



Contact us to learn more about our innovation project and purposeful supply chain development.

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