COMPETITIVENESS THROUGH

SUPPLY CHAIN INNOVATION

TOOLS

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The Danish Industry Foundation

SYDDANSK UNIVERSITET

Based on a major report, this workbook is developed to illustrate how Danish companies can work with supply chain innovation through the use of a selection of tools

The workbook consists of the following:

- Key concepts
- Two video case studies: Dinex A/S and TRESU Digital Solutions
- 20 tools with focus on supply chain innovation.

SUPPLY CHAIN MANAGEMENT

- Supply chain management focuses on material, information and financial flows in supply chains and networks of companies.
- It is customer oriented and starts in the need for goods and services, creating demand backwards in the supply chain and supply network.
- Supply chain management is about differentiated management, since companies do not approach all customers and suppliers in the same way.
- The focus is on business processes, both intra- and inter-organizational.

INNOVATION

- Innovation is about transforming new ideas and putting them into practice.
- Traditionally, a distinction is made between invention and innovation.
- Invention is used to describe the idea and concerns only the first step in an often lengthy process, in which the idea is disseminated and effectively applied.
- To use the term innovation, the idea has to be commercialized.
- The degree to which an innovation is considered new depends on the individual or the individual organization. You may find innovations that are not new to the world, but new to the company or the individuals involved.
- Innovation can be manifested in many different forms, both in technology and in the way we work.

SUPPLY CHAIN INNOVATION

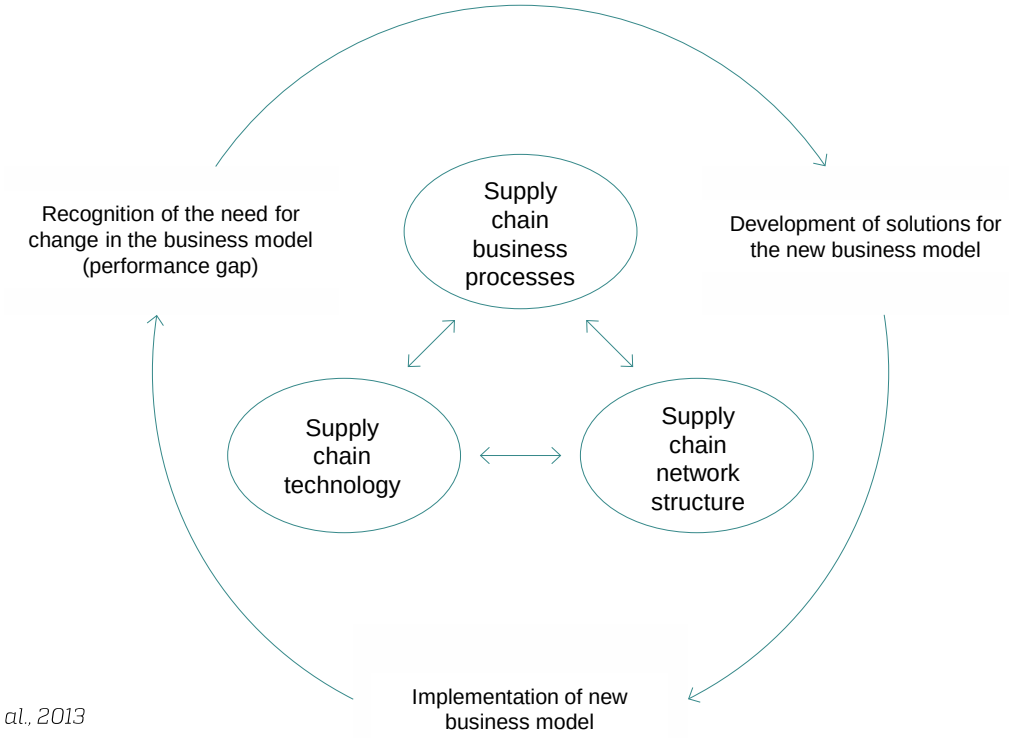
"Supply Chain Innovation is a change (incremental or radical) within a supply chain network, supply chain technology, or supply chain process (or a combination of these) that can take place in a company function, in a company, in an industry or in a supply chain in order to enhance new value creation for the stakeholder."

- Arlbjørn et al. (2011)

Supply chain innovation is composed of three elements:

1. **Business processes:** groups of activities that provide a measurable output. Typically, activities in business processes will go across the traditional functional "silos" of a company such as sales, inventory, production, and procurement.
2. **Technology:** innovation in supply chain technology relates to the technology and to its application in a supply chain context. Supply chain technologies can be used independently or in combination with other technologies, creating a supply chain innovation.
3. **Supply chain network:** the network structure of a supply chain concerns the depth as well as width of upstream and downstream relationships. Innovation in the supply chain network structure is related to the creation of value through knowledge sharing in virtual networks.

Framework for understanding supply chain innovation



Arlbjørn et al., 2013

OPERATION CONTRA DEVELOPMENT

In all organizations the dilemma regarding the allocation of resources to operations and development can be found. This phenomenon is known as ambidexterity.

In an organizational context it refers to the ability to explore and exploite (March, 1991).

- Exploration includes activities such as search, variation, risk management, experimentation, play, flexibility, discovery and innovation.
- Exploitation includes fine-tuning, choice, production, efficiency, selection, implementation and execution.

Two capacities are required to work with and master ambidexterity:

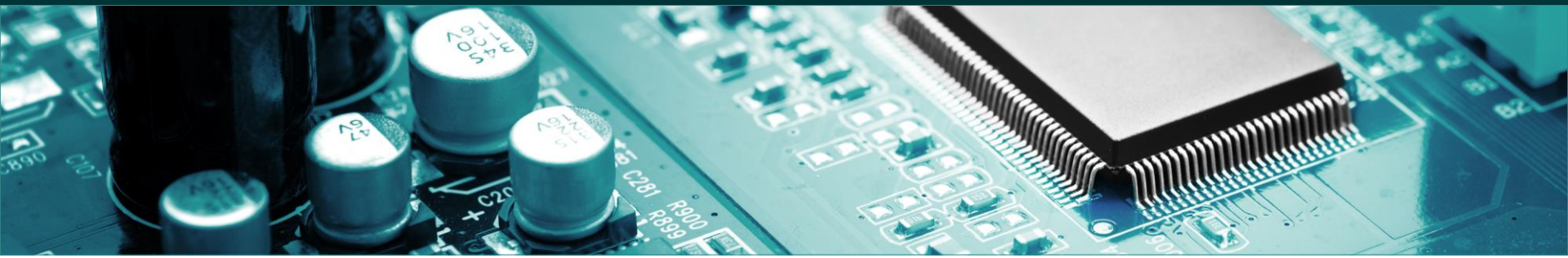
1. The company must be able to notice changes in the competitive environment, changes in technology, competition, customer portfolio and government regulation etc.
2. The company must be able to act on these opportunities and threats.

Exploration as well as exploitation are self-reinforcing phenomena and companies can get caught in their own success. Too much exploration can lead to a learning trap, while companies that only work with exploitation can be caught in a competence trap, as they focus on existing skills.

PROBLEM TYPE

The challenges of a company - generally as well as specifically for the supply chain - can be categorized into two types: tame problems and wicked problems.

The distinction between tame and wicked problems should be seen in relation to the individual company. What is regarded as a tame problem in one company can be seen as a wicked problem in another and vice versa.



A tame problem is a problem to which the solution is known, and the parties involved can test the applicability of a suggested solution.

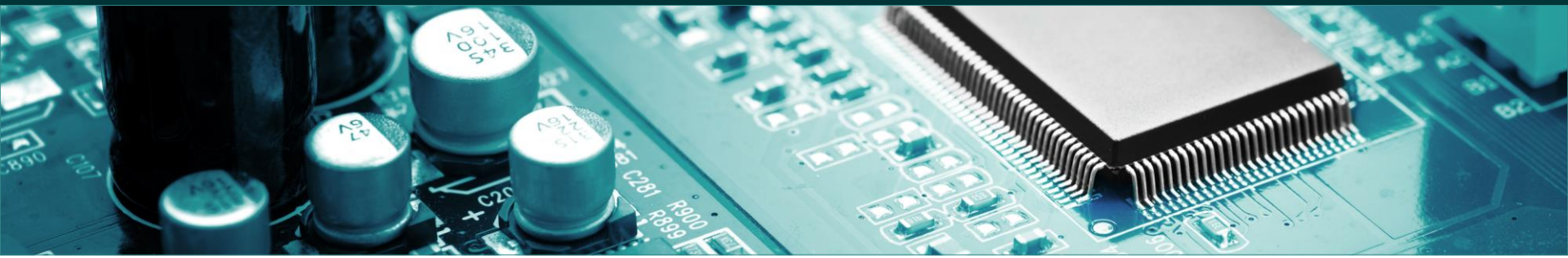
Examples of tame problems in a supply chain context could be:

- Reorganisation of stock after picking frequency.
- Establishment of performance management
- Implementation of vendor managed inventories.

A wicked problem is characterized as a problem to which the solution is not known. Therefore, one can not reach a clear or definitive solution but only a solution that is “satisfactory” with the given resources.

Examples of wicked problems in a supply chain context could be:

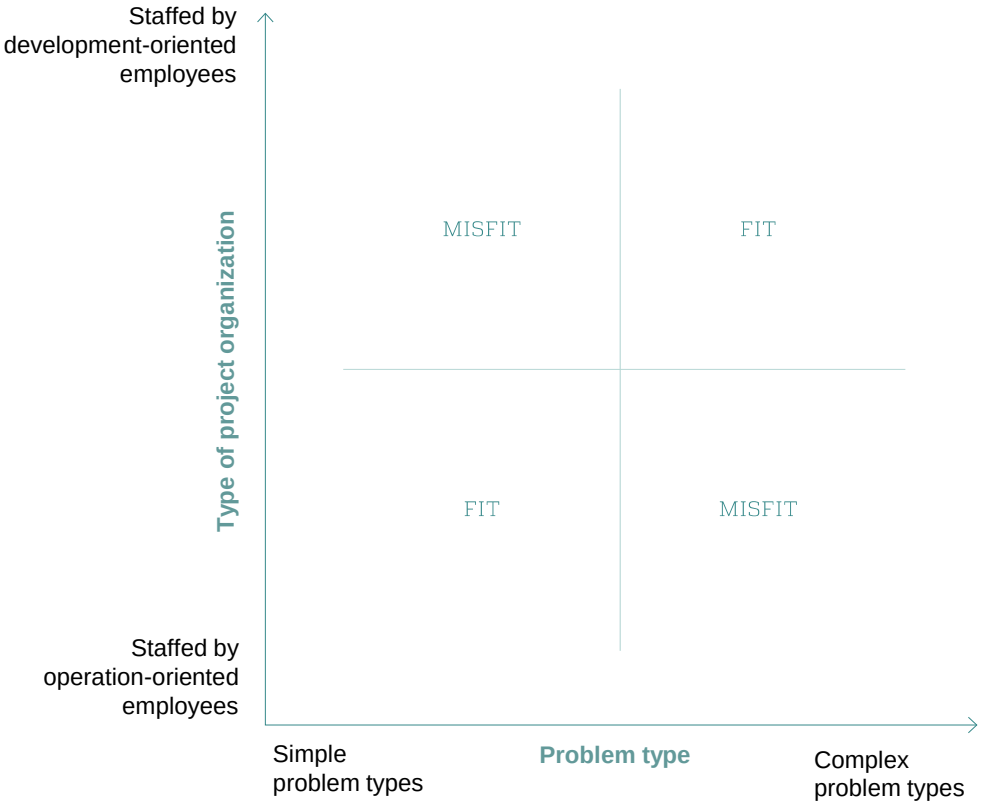
- Domiciling a European warehouse of finished goods to meet the demands for short lead-time for various European markets.
- Optimized phasing in and out of products or components.
- Supplier reorganization.



In a supply chain innovation context, it is important to bear in mind the relationship between organization and type of problem.

When combining the concepts of operation and development with tame and wicked problems, you will have four problem situations.

Relationship between project organization and problem type



The figure illustrates that a fit is achieved when innovation projects covering simple or tame problems are staffed with predominantly operation-oriented employees.

Likewise, a fit is achieved when projects including complicated or wicked problems are staffed with development-oriented employees.

It is important to point out that the axes in the figure should be read as a continuum, meaning that a problem can be respectively tame or wicked to a greater or lesser extent, and staffing of projects is described as being primarily operation-oriented toward being development-oriented.

This means that there may be development-oriented resources in innovation projects dealing with tame problems. Likewise there can be operations-oriented resources in wicked innovation projects.

MISFIT occurs when management does not have sufficiently focus on the organization working with the specific development project

VALUE BASED SUPPLY CHAIN INNOVATION

Value based supply chain innovation can be understood through the concepts; Value Capture and Value Delivery (Munksgaard, Stentoft & Paulraj, 2014)

In the context of supply chain innovation, the company must create awareness of the way in which the specific innovation includes both value capture and value delivery.

Value capture focuses on the way in which the specific supply chain innovation captures value. This means that it refers to the company's profit as well as how the company efficiently performs its value-adding activities. As examples of value capture can be mentioned improved internal processes, cost reductions, and quality improvements as a result of a supply chain innovation.

Value delivery focuses on the processes that create value for external partners (usually customers). These are activities that go across company functions, for example reduced lead times to customers, improved delivery performance, and delivery information.

CASES

- Dinex A/S is a leading global manufacturer and distributor of innovative exhaust and emission control products and solutions for the heavy duty diesel and gas engine industry.
- TRESU Digital Solution is a leading manufacturer of flexo printing machines and equipment for the graphics industry within flexo, offset and digital.

- The video case material has been prepared as examples of how to work with supply chain innovation at different stages.
- The material is available at www.industriensfond.dk and www.recoe.dk

THE TOOLS: AN OVERVIEW

The workbook consists of 20 tools that are split into two main areas, 1) tools developed to deliver specific supply chain facts and 2) tools related to monitoring and follow-up.

For all tools apply that they can be used to determine how the actual practice is (AS-IS) as well as to determine the frame for the future (TO-BE).

Supply chain innovation is often a part of the company's overall strategy. These strategy processes must be implemented with careful attention to the company's specific characteristics and the degree of dynamic in the environment.

The workbook's supply chain facts oriented tools are divided into five areas:

- Strategy
- Systems
- Performance
- Organization
- Structure

In addition, five tools for monitoring and follow-up are presented.

An overview over tools for supply chain innovation

SUPPLY CHAIN FACTS

STRATEGY	• Supply chain SWOT • Supply chain gap analysis • Strategic requirements for the supply chain
SYSTEMS	• Master data • System infrastructure • IT readiness
PERFORMANCE	• Definition of a measurement • Reporting of a measurement • Supply chain accounting
ORGANIZATION	• Stakeholder analysis • Balance between operation and development • Competence to change
STRUCTURE	• Supply chain segmentation • Centralised versus decentralised stock • Supply chain complexity

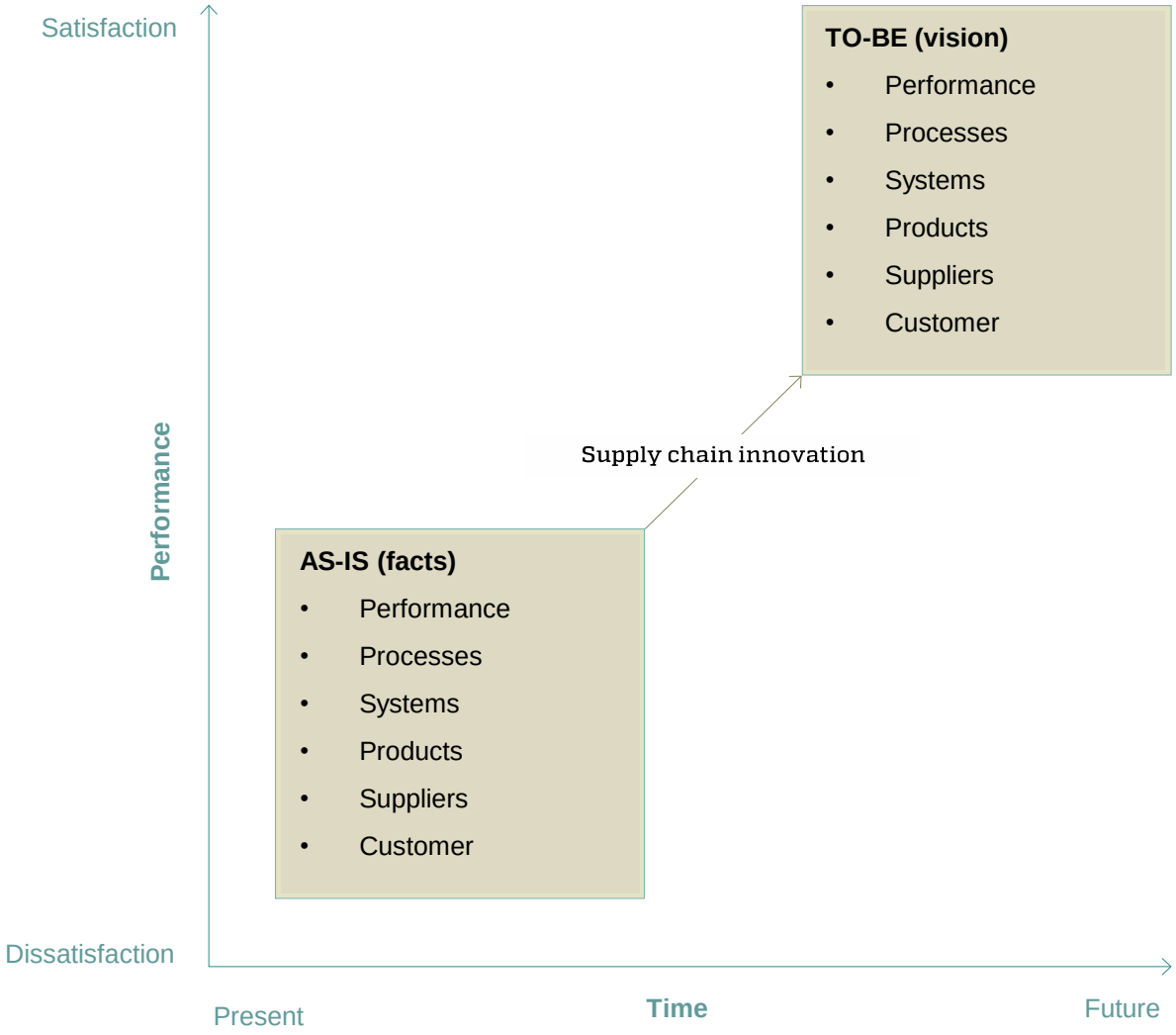
MONITORING / FOLLOW-UP

MANAGEMENT	• Business case • Project reporting • Project portfolio • Communication plan • Risk management in supply chains

The tools may be used to create facts on the current supply chain performance and may contribute to the vision processes concerning the future supply chain performance.

The message is that any performance gap can be closed with supply chain innovation.

Fact driven development



The tools have been developed from a supply chain innovation perspective and each tool is described by the following six headings:

1. **Purpose:** the purpose of using the tool.
2. **Participant(s):** Who (within a company's supply chain) should implement the tool or provide input.
3. **Application:** When the tool is used.
4. **Method:** How the tool is used.
5. **Benefits:** What can be gained by implementing the tool.
6. **Output:** What is the specific output of the tool.