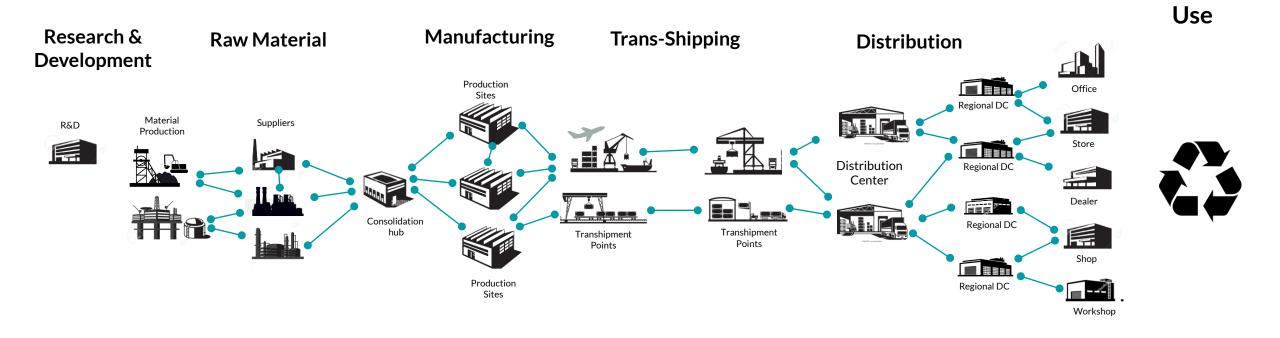
Business criterids for selection of 3D-printed components

RI. SE

The global supply chain





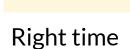
The Challenges of Logistics



Right product

Right quantity

Right place





Digitalisation of Transportation

Control Towers

Connectivity

Artificial Intelligence



Autonomous

RI. SE

Digitalisation of physical movement

Postal logistics digital transformation



From prototyping to mass production

The HP Metal Jet for mass production of metallic 3D printing

hp

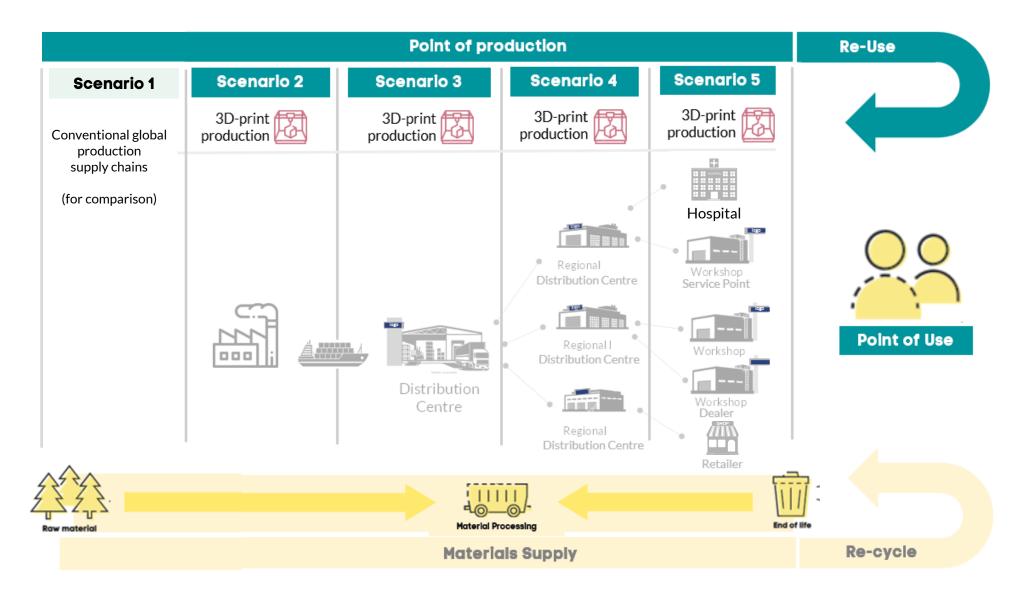


04h:S1min



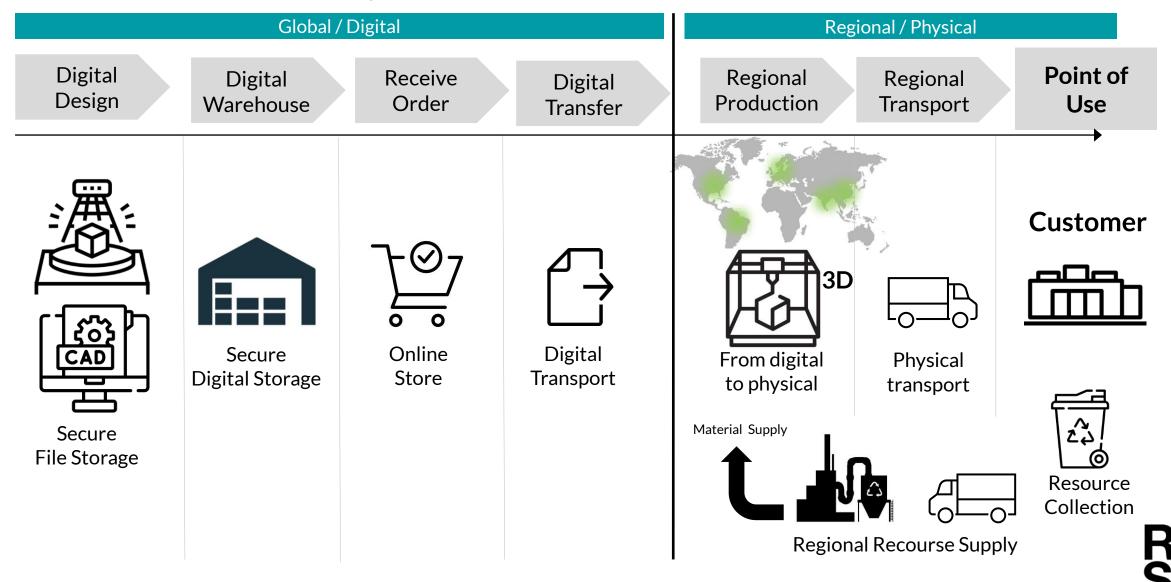
How will AM (3D-print) change business?

5 Supply Chain Scenarios



RI. SE

Example of Digital Supply Chain Scenario



Supply Chain Values

Reduce	Reduce	Reduce	Reduce	Optimize Demand
transportation	Production Cost	Warehouse costs	Inventory Costs	management
Reduce air Transports Reduce road transports Reduce logistics risks e.g. delays Reduce transportation Lead Time	Small scale production to reduce product cost for small volumes.	Optimise space usage Reduce heating Reduce inventory Material handling	Reduce dead stock Obsolesce Reduce depreciation volumes Fulfil All-Time Requirement)	Just-In-Demand production From Forecast to demand driven Avoid Out-of -Stock

Business Opportunities

Sustainability	Increase	Increase Parts	Deliver on	Extend over the		
	Uptime	Availability	Customer Promise	product lifecycle		
Sustainability savings + image Lifecycle perspective Produce component Transport Warehousing Space + energy Scrapping	Decrease leadtime of parts delivery Right product at the right	0,5% increase in availability increases sales with 1%	Deliver on contracted part availability +15 Parts Availability End-of-production	By possible availability of old parts we can get.		



SPARSAM

Sustainability Parameters for Parts Analyses and Selection for Additive Manufacturing

VOLVO





SPARSAM Summary of Results

NEW



Which Components shall be 3D printed?

Technical Selection Criteria's

- Complex shape
- Expensive material
- Low weight is essential
- Technical properties can be improved •
- Individual variations (tailored)
- Potential to parts consolidation
- A need to reduce assembly time
- Smaller series .

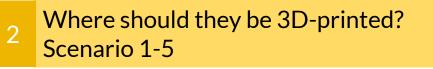
Business Selection Criteria's

- Reduced Warehouse cost
- Reduced Inventory Costs ٠
- Increased Part Availability ٠
- Lead time
- **Optimized Demand Management**
- **Reduced Transportation** ٠
- Reduced Production Cost .
- Increased Uptime ٠

Sustainability Selection Criteria's

- CO2 Emissions
- Material Consumption
- Energy Usage ٠

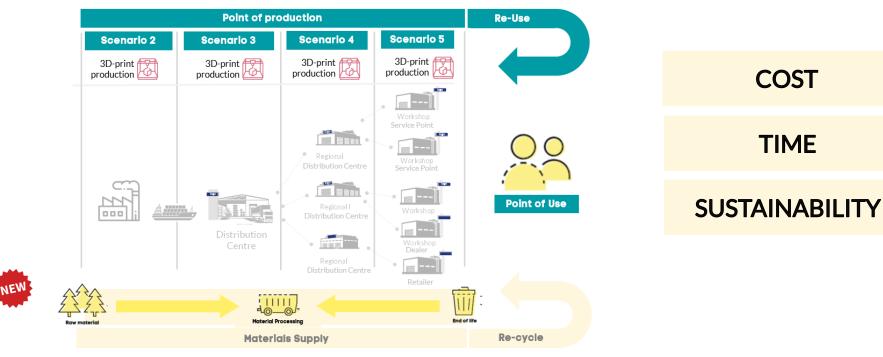
SPARSAM: Extends the technical selection criteria's with business and sustainability selection criteria's



What are the saving and value in each scenario?

COST

TIME



SPARSAM: Provides a generic model to describe convectional

supply chains and production scenarios based on 3D-printing

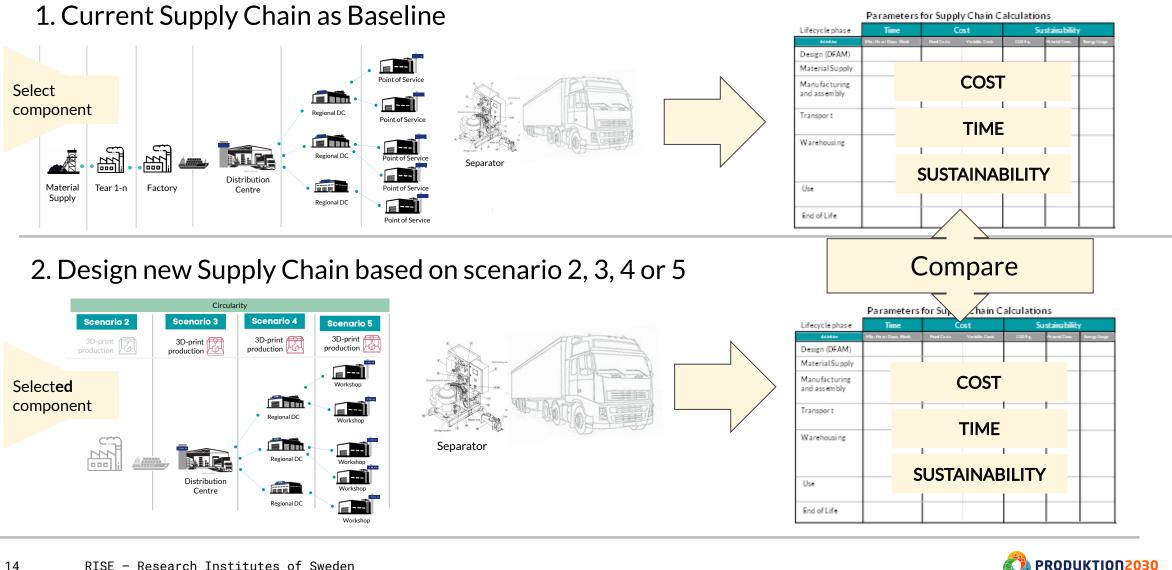
NEW

3

SPARSAM: Provides a model to calculate the value with-3d print compared to conversional methods

Example of use

Verify and develop the model to quantify Time, Cost, Sustainability Gains



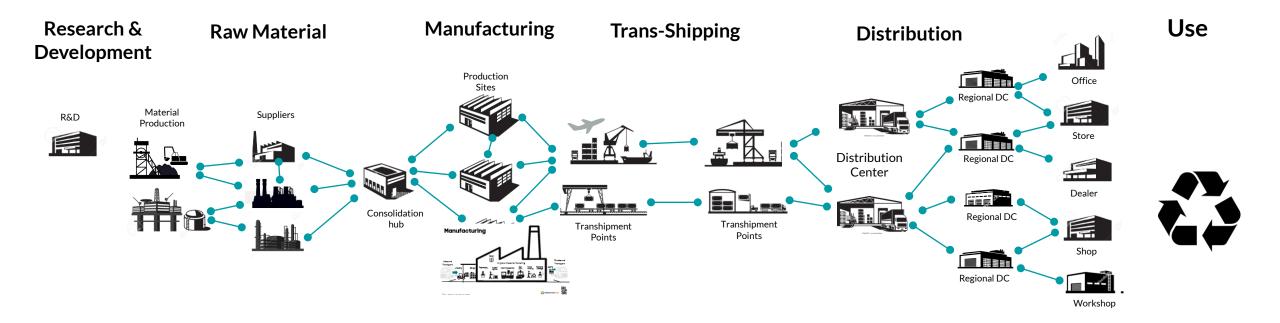


The Principle

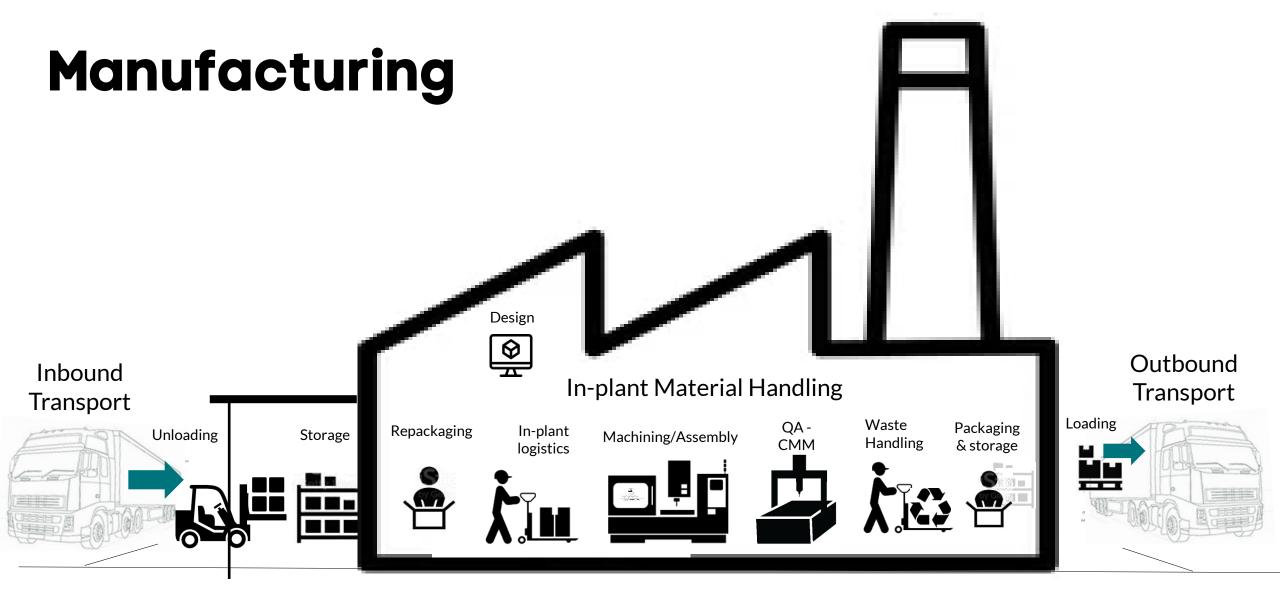
For calculating cost, time & sustainability savings for 3D-printed parts



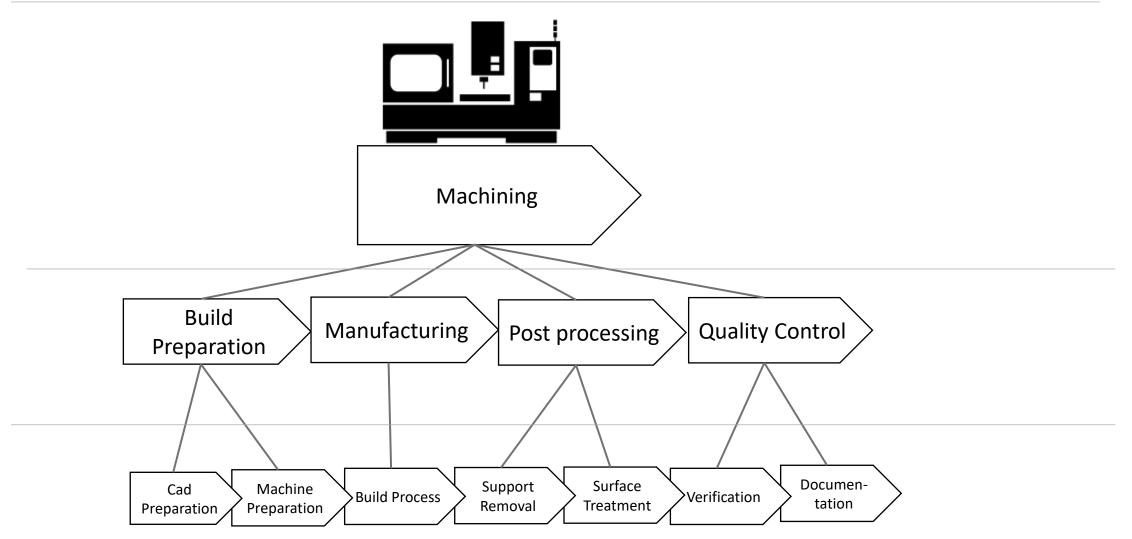
Scenario 1 - The traditional supply chain

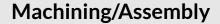


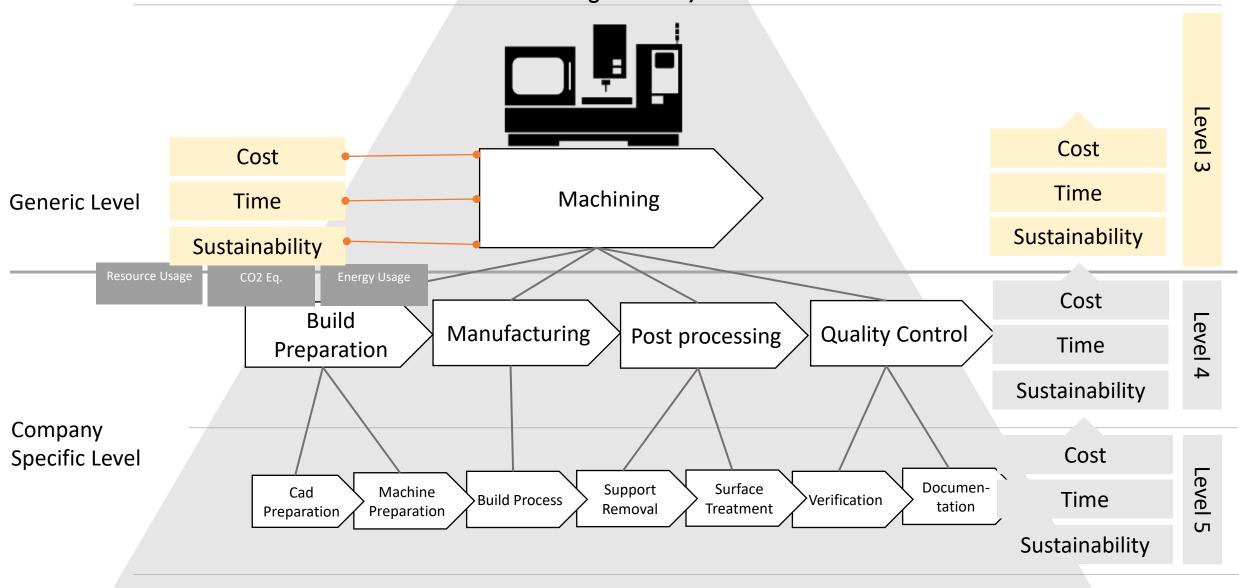






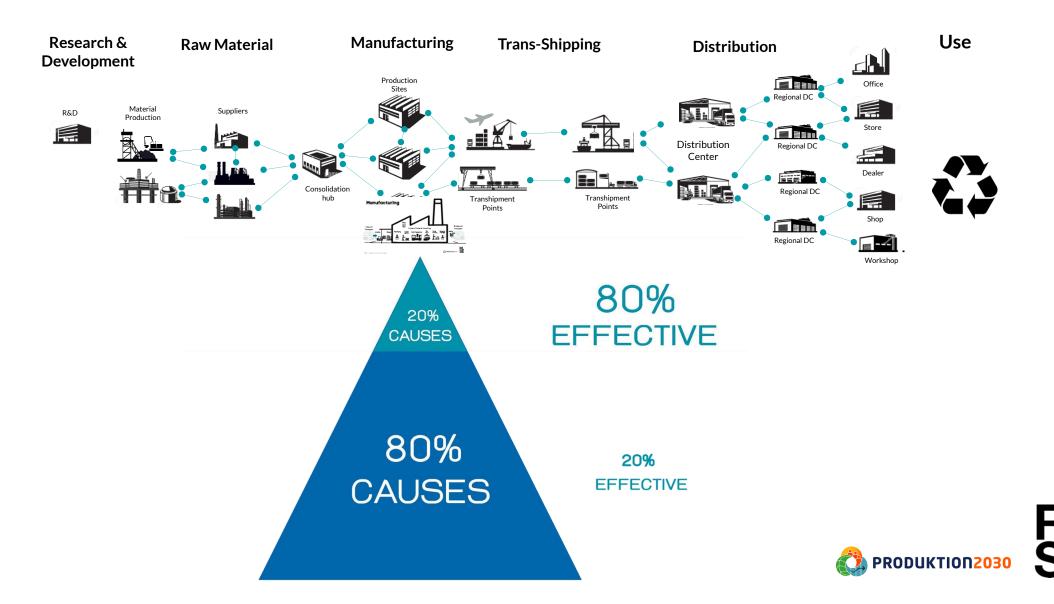






Level 2

Pareto Principle



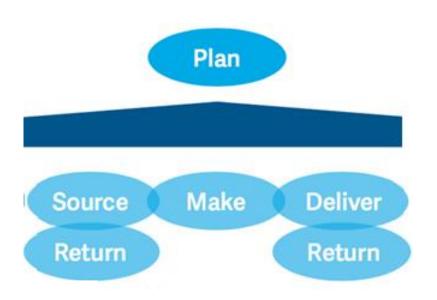
The Method

For calculating cost, time & sustainability savings for 3D-printed parts





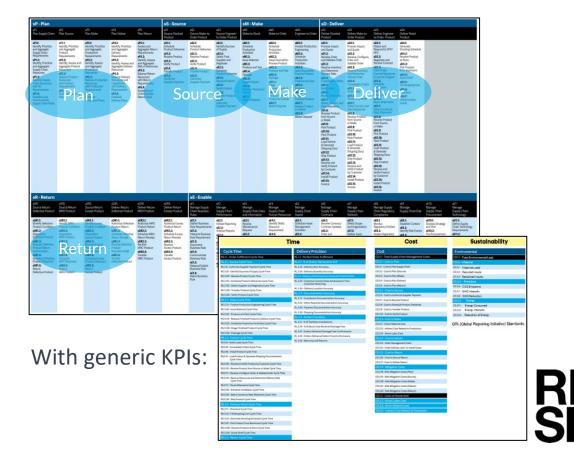
SCOR consists of five key processes:



The SCOR (Supply Chain Operations Reference) model is a widelyused framework for analyzing and optimizing supply chains.

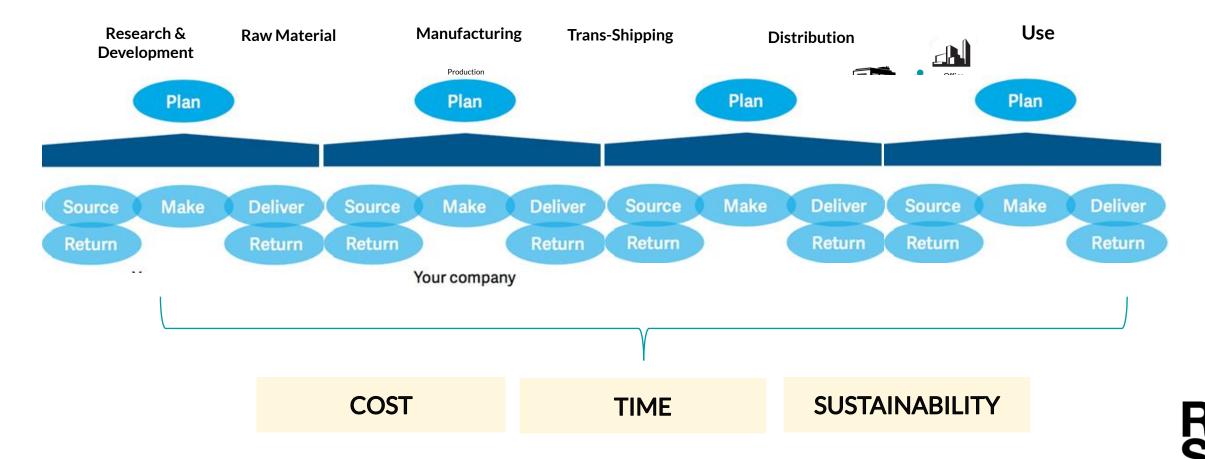
It was developed by the Supply Chain Council, a non-profit organization and is an open access framework.

Each of the 5 process is further broken down into a set of generic sub-processes

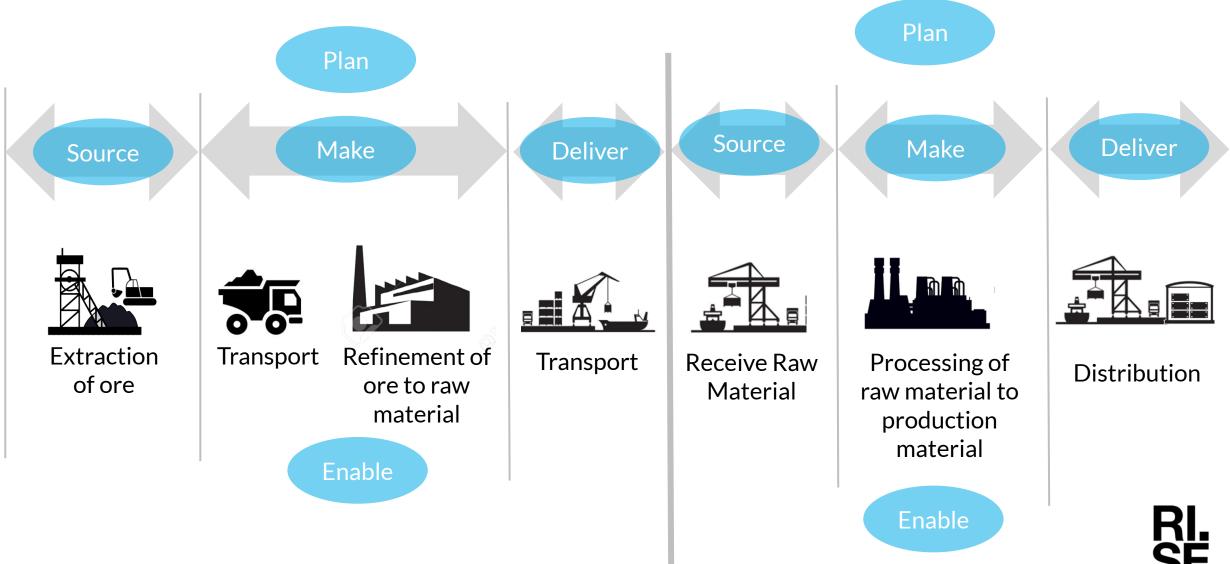


SCOR - To model a traditional supply chain





Example Raw material supply chain



Build unique supply chains with generic activities

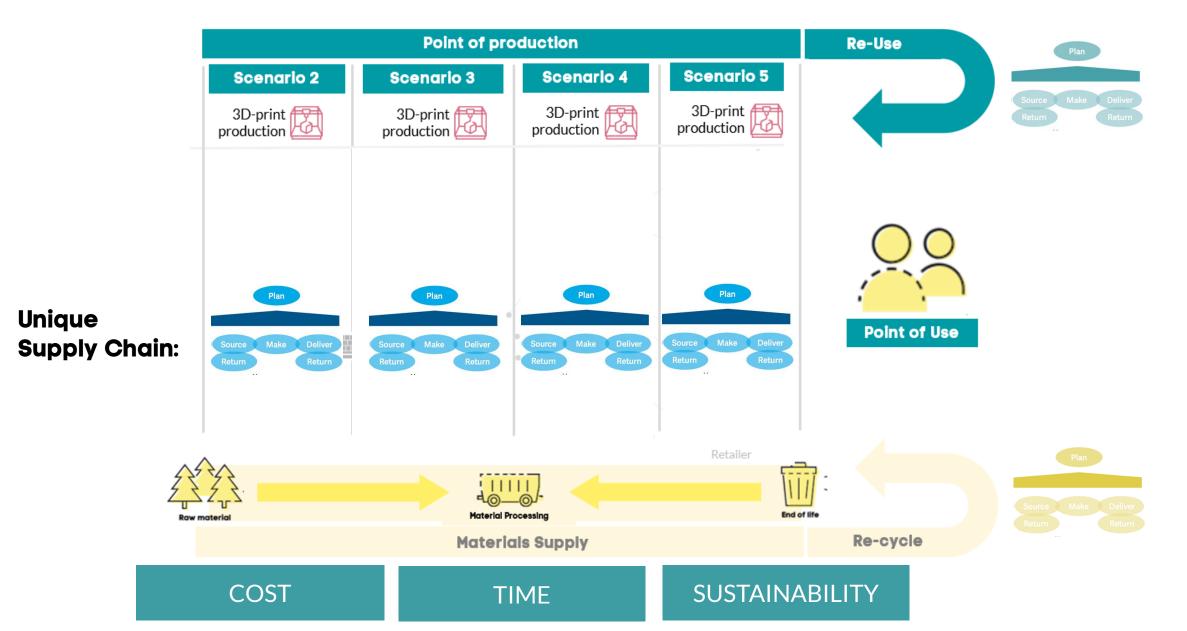
A box of generic activities:

sP - Plan sS - Source				sM - Make			sD - Deliver									
Pl Tan Supply Chain	192 Plan Source	s73 Pian Male	sN RetDelver	95 Par Return	dST Source Stocked Preduct	152 Source Make to Order Product	103 Source Engineer- to-Oxfee Product	shi Male to Stock	sk2 Note to Order	MS Engineer to Coder	sZR Delver Stocked Product	102 Delver Mile to Order Probat	103 DelverEngineer- tu-Order Product	sD4 Deliver Retail Peokast		
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Model supply chains with AM/3D print



The Results

What are the cost, time & sustainability savings for 3D-printed parts?

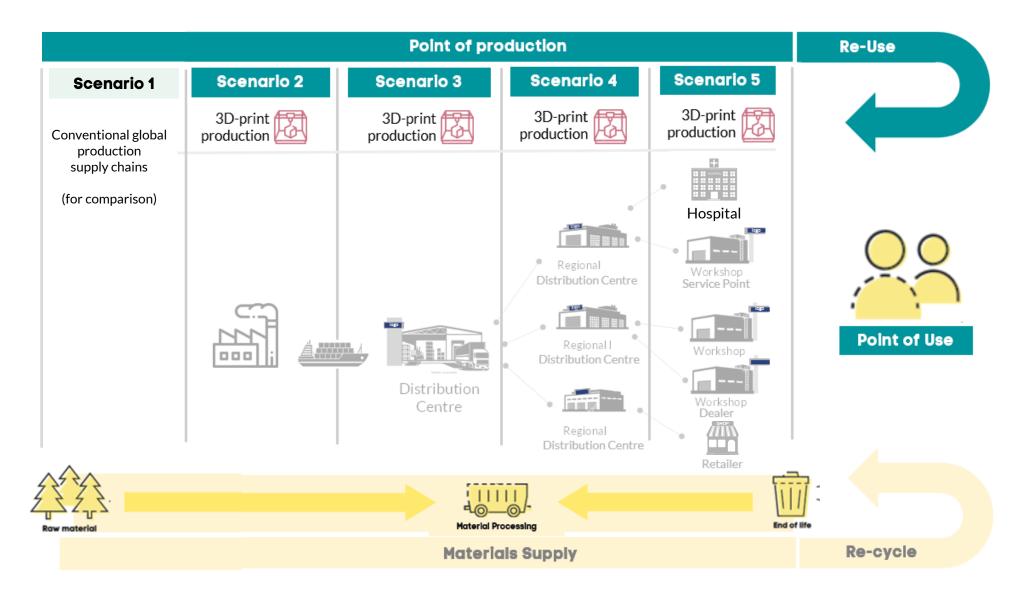




Researching...



5 Supply Chain Scenarios



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Follow or participate in the research!



Markus Eriksson +46 733 98 23 36 markus.eriksson@ri.se



Research: Just-In-Demand Matching demand with 3D-printed supply



Project: SPARSAM Quantify Cost, Time & Sustainability savings with 3D-print

