



# Business Applications supporting Supply Chain Management (SCM)

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Global BA Lead Supply Chain and Procurement

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# Who I Am

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- 2002 Matriculation at German School in Pretoria (South Africa)
- 2006 B.Eng. Industrial Engineering @ University of Pretoria (South Africa)



- Supply chain trainee, coordinator and manager @ Avery Dennison (Netherlands, UK and Germany)



- 2013 M.Sc. Wirtschaftsinformatik @ University of Hamburg
- Business Analyst SC -> Global BA Lead Supply Chain and Procurement @ Avery Dennison



## Who We Are

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Avery Dennison is a global materials manufacturer of branding and information labeling solutions and functional materials for consumer goods, apparel, food, logistics, industrial and healthcare industries.

Number of employees worldwide  
**More than 32,000**

Operations in more than  
**50 countries**

Sales in 2020  
**\$7 billion**

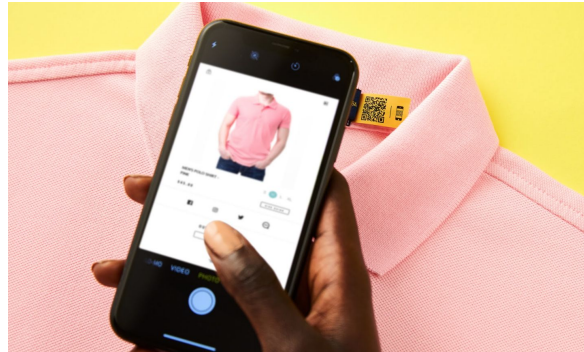
Fortune rank as of the end of 2020  
**435**

# Our Businesses at a Glance



## Label and Graphic Materials

- Label and Packaging Materials
- Graphics Solutions
- Reflective Solutions



## Retail Branding and Information Solutions

- Tickets, Tags, Labels, and Embellishments for Retail Apparel
- Radio-Frequency Identification
- Printer Solutions



## Industrial and Healthcare Materials

- Performance Tapes
- Adhesives
- Fastener Solutions
- Medical Solutions

### 2020 SALES

\$4.7 bil.

\$1.6 bil.

\$626 mil.

## Our Competitive Advantages

- **Global scale; ~190 operating locations**  
Recognized industry leader with a global footprint, including a strong presence in emerging markets
- **Innovative materials science capabilities; vertically integrated in adhesives**
- **Innovative process technology**
- **Operational and commercial excellence**
- **Industry-leading innovations enabling functionality and sustainability**



# Avery Dennison Coating Machines



# Avery Dennison Products

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# Avery Dennison End Products

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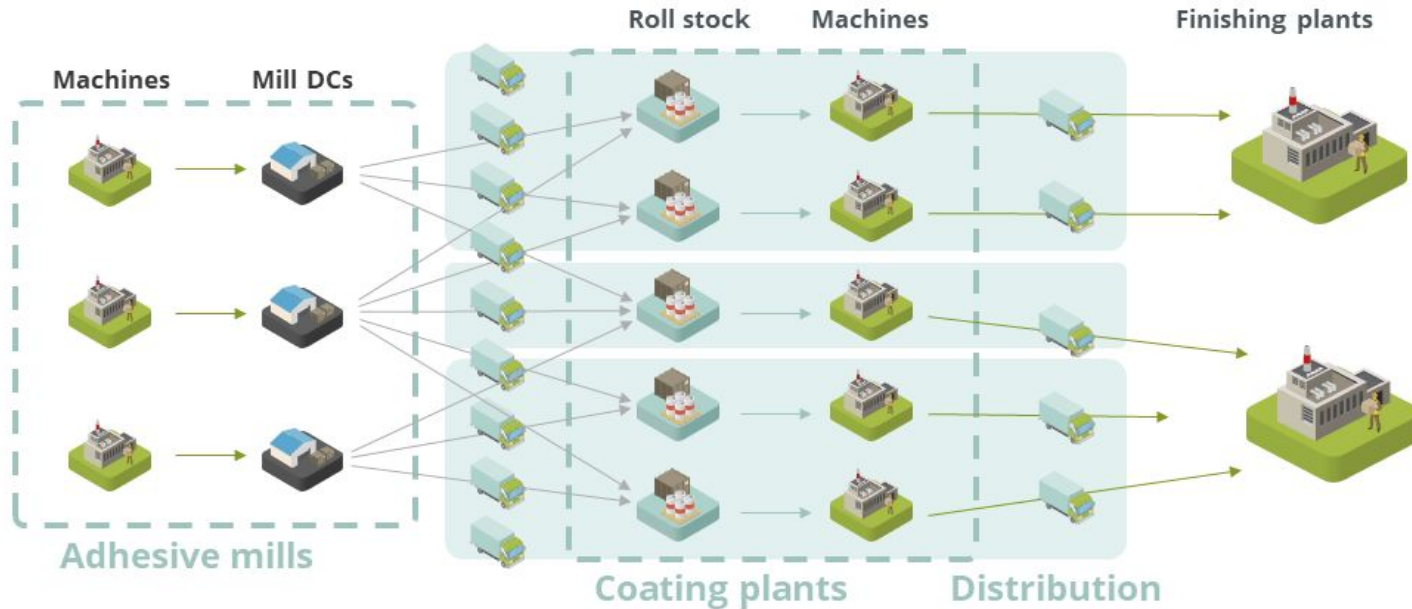
# Avery Dennison End Products

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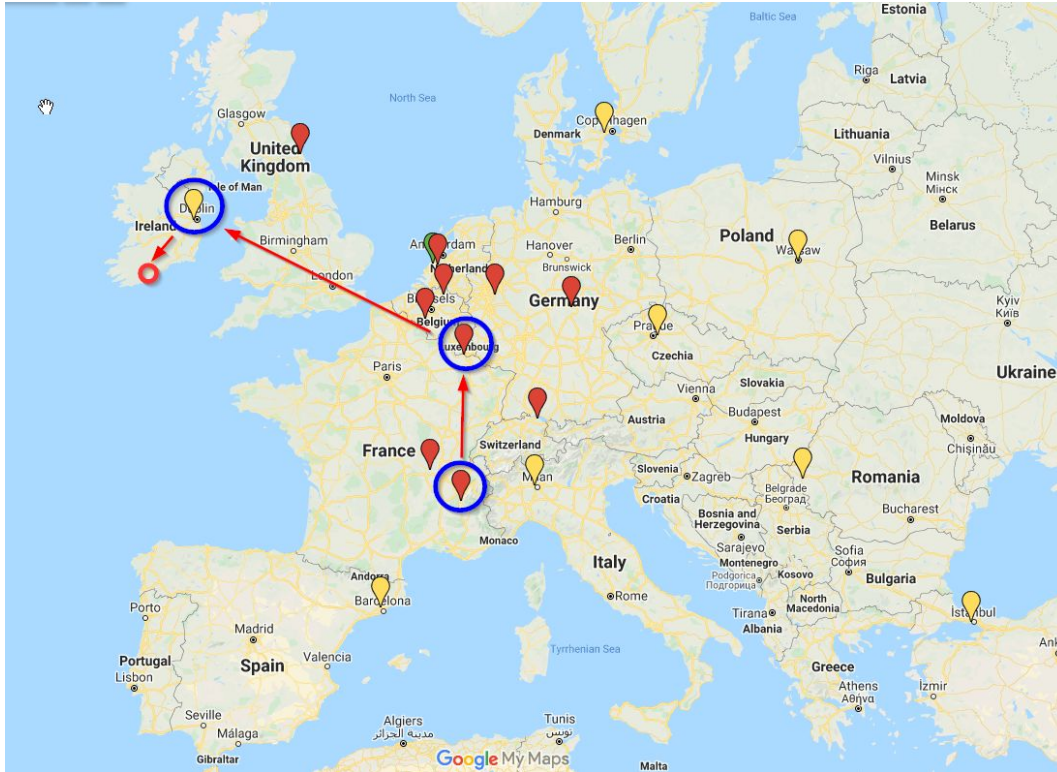


# What is SCM @ Avery Dennison

**Supply-chain management** has been defined as the "design, planning, execution, control, and monitoring of supply-chain activities with the objective of creating net value, building a competitive infrastructure, leveraging worldwide logistics, synchronizing supply with demand and measuring performance globally"



# “Make to Order” Fulfillment Example



- A Customer in Ireland Orders a Speciality Product which requires Manufacturing
- The main manufacturing step (coating) can only be done in our french Factory in Champ-sur-drac
- All shipments into the Irish market are consolidated through our main Logistics hub in Athis
- The final manufacturing step (finishing) is done in the local Distribution Center in Dublin
- The final delivery to the Customer will be a small delivery vehicle to southern Ireland

# Stakeholder Questions towards the Supply Chain (Current state)

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- **Sales:** How many unfulfilled Sales Orders does this Customer have?
- **Finance:** Are there any outstanding Payments due and what risks are associated with this customers?
- **Procurement:** How much raw material is available in the production site and do we have an alternative approved supplier?
- **Operations:** When is the Production Planned for and do we require an overtime shift on the weekend?
- **Quality:** We received a Quality claim from the last production. Are there any other impacted Customers?
- **Trade Compliance:** Are deliveries travelling through the UK or will they travel by boat and stay within the European Union?

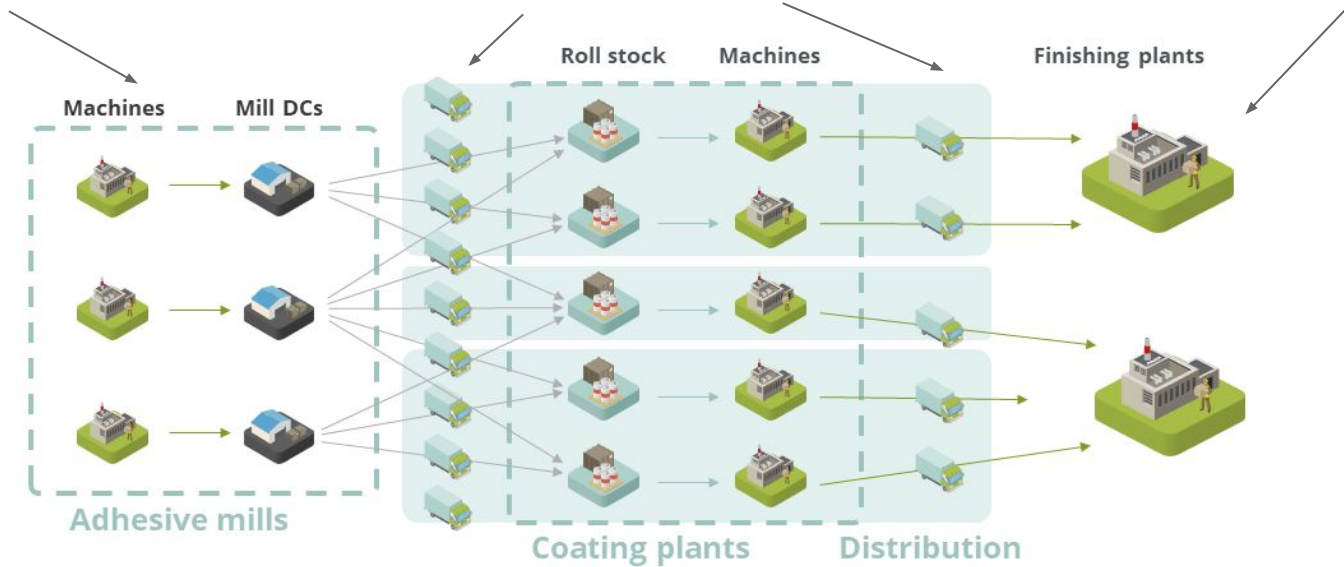
# Digital Twin of the Current Supply Chain

Central ERP - Central System of Record

**MES: Controlling the Shopfloor**

**TMS: Controlling Transport**

**WMS: Controlling the Warehouse**



# Monitoring and Responding to Deviations in the Supply Chain

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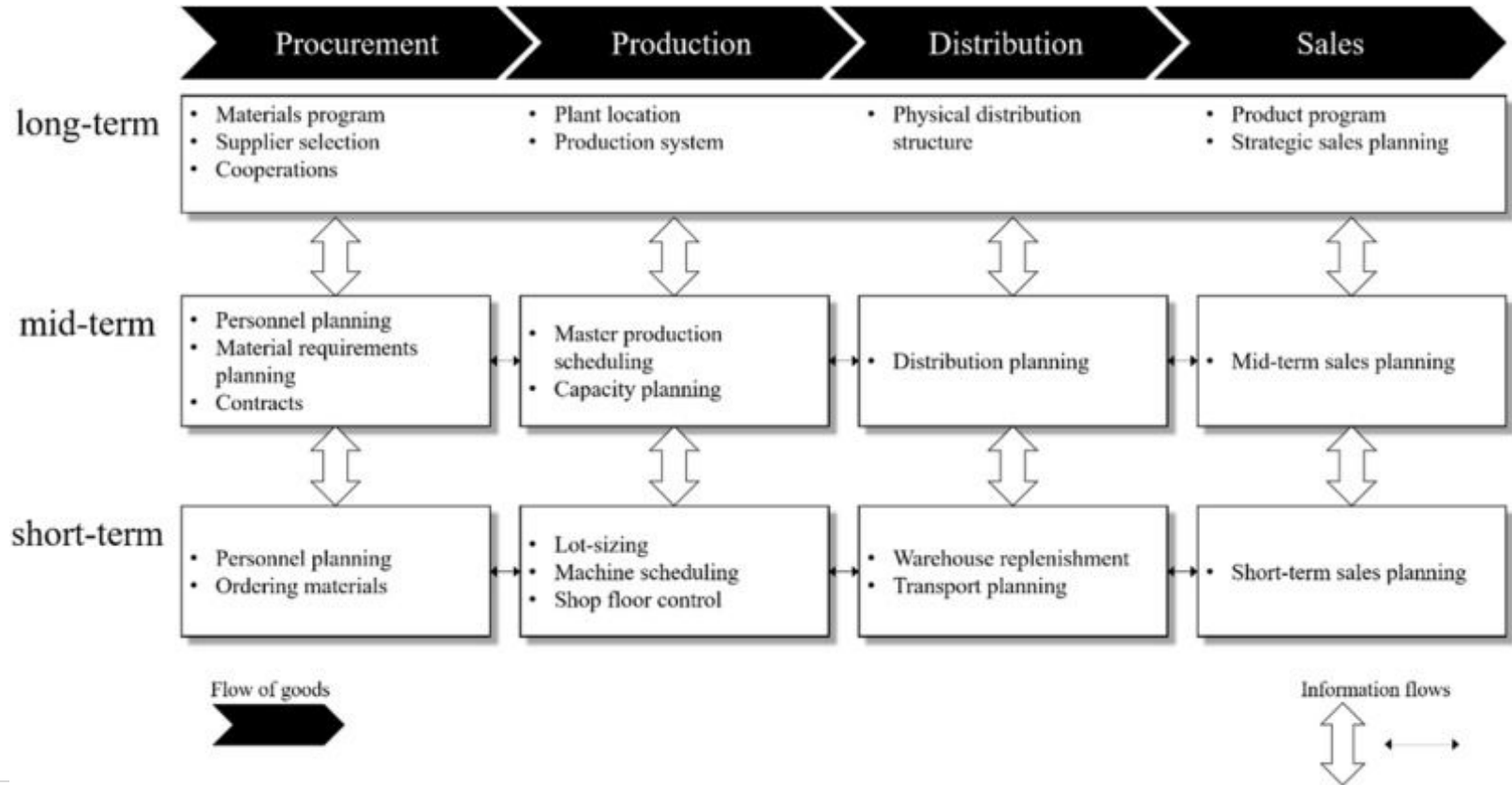
- EDW
- KPI Reporting
- Alerts
- Deviations

# Stakeholder Questions towards the Supply Chain (Future state -> Planning)

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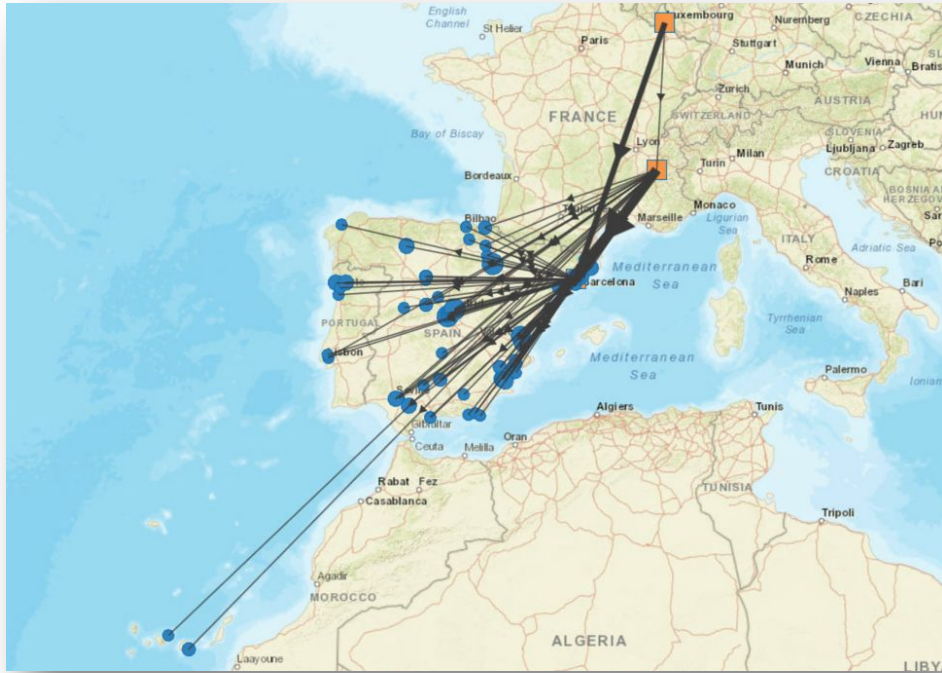
- **Sales:**
- **Finance:**
- **Procurement:**
- **Operations:**
- **Quality:**
- **Trade Compliance:**

# SCM Planning Matrix

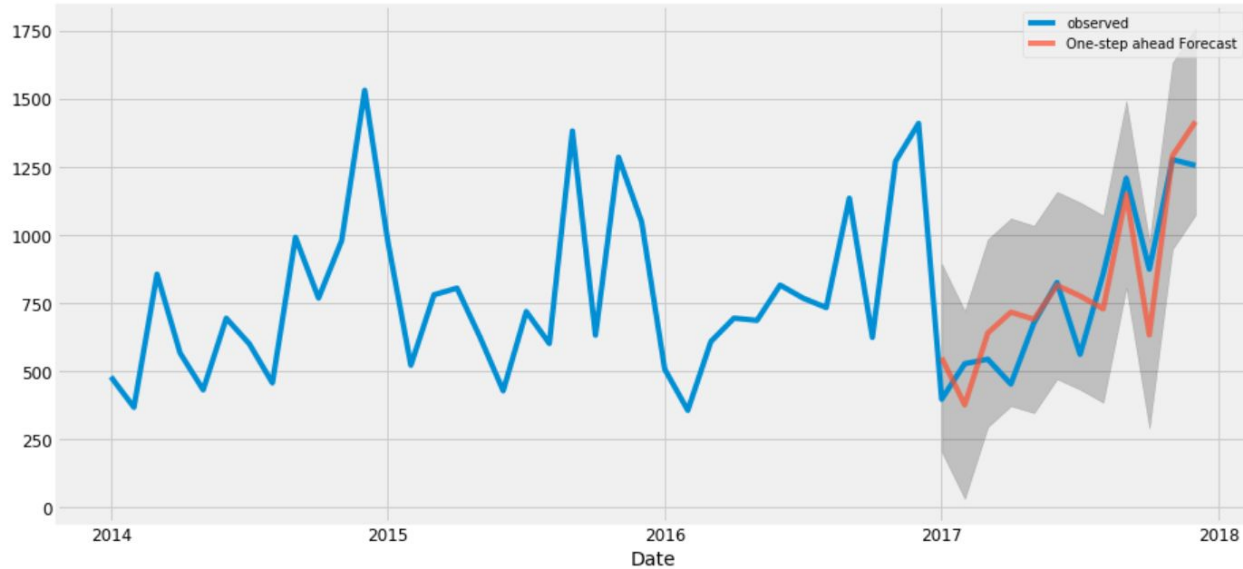




# Typical SCM Systems: Network Design



# Typical SCM Systems: Forecasting



# Typical SCM Systems: Supply Planning

Product Planning

Find: IST

- All productlocations (3/3639)
  - 1. SELECTION FINAL (5/1314)
    - LUX1 (21/900)
    - LUX2 (3/136)
  - RS000N (4/22)
    - S692N (4/37)
      - AF185 (9/17)
      - AL539 (7/8)
      - AL597 (6/11)
        - CRA (1/1)
        - GTH (1/1)
        - IST (2/2)
        - LUX (5/5)
          - AL59701/LUX/MR/LM
          - AL59702/LUX/MR/LM
          - AL59704/LUX/MR/LM
          - BS80501/LUX/MR/LM
          - BS80502/LUX/MR/LM
          - MIL (1/1)
          - WRS (1/1)
          - BU349 (1/1)
          - TRUE CUT (13/77)
            - LUX31 (6/187)
            - LUX32 (2/79)
            - ~ (1/12)
  - 2. NOT STOCKABLE (5/1419)
  - 4. NO RESPONSIBILITY (1/906)

AD Volume Planning
AD Distribution Planning

21:23:22

	2020-04-07	2020-04-08	2020-04-09	2020-04-10	2020-04-11	2020-04-12
LUX1	[Gantt chart showing resource usage for LUX1]					
LUX2	[Gantt chart showing resource usage for LUX2]					
LUX31	[Gantt chart showing resource usage for LUX31]					

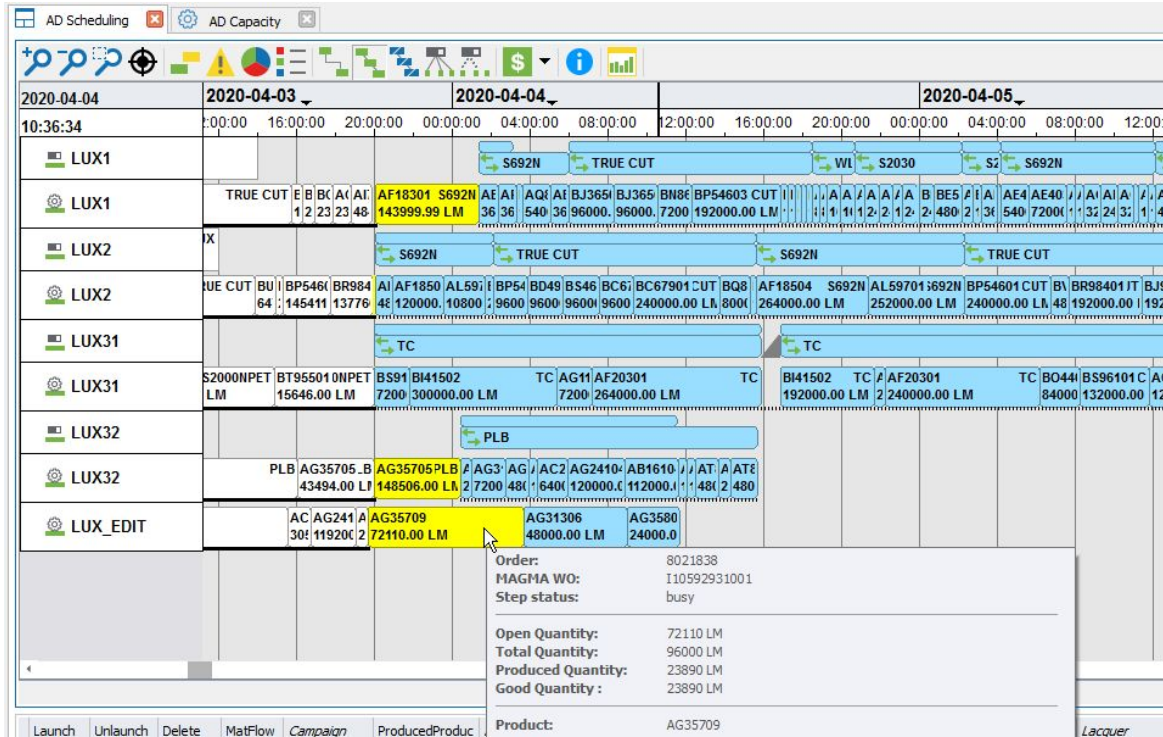
Planning | Campaign Plan | Campaign Assignment | Coating Plan | Finishing Plan | Processes | Stock per Date | Planning Review

S Item Col	Start	2020-04-03	2020-04-04	2020-04-05	2020-04-06	2020-04-07	2020-04-08	2020-04-09	2020-04-10	2020-04-11	2020-04-12	2020-04-13	2020-04-14	2020-04-15	2020-04-16	2020
AL59702/LUX/MR/LM																
Tot.Dep.Req.		735			48,565	20,000	66,167	30,484	153,648				120,376	20,447	246,720	
Tot.Plan Avail.			22,700	85,300	72,000				108,000		288,000	36,000		72,000	72,000	
Tot.Plan	265,829	22,700	85,300	72,000				108,000		288,000	36,000		72,000	72,000		
Tot.Inv.Movement	-30,317															
Tot.Inventory	43,441	42,706	65,406	150,706	174,141	154,141	87,974	57,490	11,843	11,843	299,843	335,843	215,467	267,020	92,300	
Indep. Req. (Forecast) -		79,605							27,909	27,909			20,685	20,685	20,685	
Tot.Inventory (Forecast)	43,441	-36,899	-14,199	71,101	66,627	18,718	-75,358	-133,751	-207,307	-207,307	80,693	96,008	-45,052	-14,184	-209,588	
Campaign - S692N / LUX2						-0.3	2.5	2.5	3.6	3.2	-0.2		0.6	3.0	1.5	
Tot.Target Inv.	91,068	91,068	91,068	91,068	91,068	91,068	91,068	91,068	91,068	91,068	91,068	91,068	91,068	91,068	91,068	

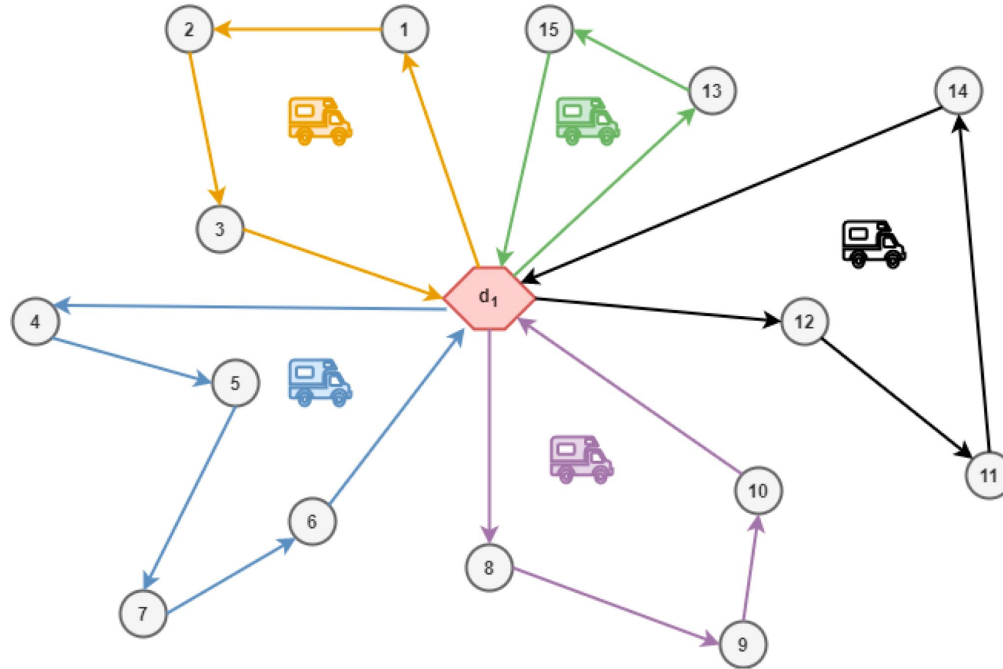
Actual Components | Product Info | Inventory Movements | Machines | Actual Where Used All Levels | Possible Components | Possible Where Used

S Item Col	Start	2020-04-03	2020-04-04	2020-04-05	2020-04-06	2020-04-07	2020-04-08	2020-04-09	2020-04-10	2020-04-11	2020-04-12	2020-04-13	2020-04-14	2020-04-15	2020-04-16	2020
BI41502/LUX/IM/LM																
Tot.Dep.Req.		22,700	218,838	262,462		72,000	12,000	108,000		288,000	36,000	12,000	180,000	316,000	64,000	
Tot.Plan	846,301	86,950	405,050			289,215	144,000			492,000	72,000				2	
Tot.Inv.Movement	-49,171															
Tot.Inventory	148,944	126,244	-5,644	136,944	136,944	64,944	342,159	378,159	378,159	90,159	546,159	606,159	426,159	110,159	46,159	
ATP	-197,841	-197,841	-197,841	-197,841	-197,841	-197,841	-197,841	-197,841	-197,841	-197,841	-197,841	-197,841	-197,841	-197,841	-197,841	
Campaign - TC / LUX31						1.5				-0.7	-1.3	-0.4	-0.3			
BI41302/LUX/FA/LM																
Tot.Dep.Req.		86,950	405,050			289,215	144,000			492,000	72,000				2	

# Typical SCM Systems: Detailed Scheduling



# Typical SCM Systems: Transport Planning



# Typical SCM Systems: Industry Specific Systems

Standard CSP | **Standard CSP Imperial** | Cost CSP

Stock Width:

Max Cuts:  Max Dimensions:  Min Knife Changes

Width	Demand	Add	Minus	Remove	Options
6.0	9	<input type="button" value="+"/>	<input type="button" value="-"/>	<input type="button" value="Remove"/>	
7.75	10	<input type="button" value="+"/>	<input type="button" value="-"/>	<input type="button" value="Remove"/>	
8.0	3	<input type="button" value="+"/>	<input type="button" value="-"/>	<input type="button" value="Remove"/>	
8.125	6	<input type="button" value="+"/>	<input type="button" value="-"/>	<input type="button" value="Remove"/>	
9.75	4	<input type="button" value="+"/>	<input type="button" value="-"/>	<input type="button" value="Remove"/>	
11.125	7	<input type="button" value="+"/>	<input type="button" value="-"/>	<input type="button" value="Remove"/>	
13.25	6	<input type="button" value="+"/>	<input type="button" value="-"/>	<input type="button" value="Remove"/>	
13.125	5	<input type="button" value="+"/>	<input type="button" value="-"/>	<input type="button" value="Remove"/>	

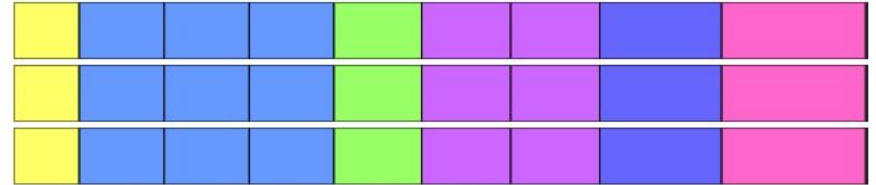
Width:  Demand:

Show Cut Patterns

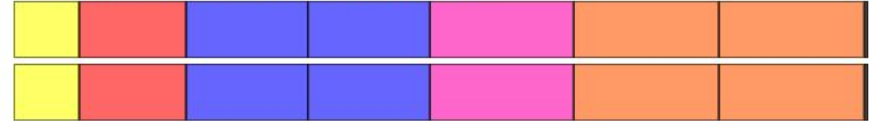
=====Solution=====

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 Lifts: 6 - Offcut: 1.750/468 = 0.37%  
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3x 77.750/78 - 9 - 1x6 3x7.75 1x8 2x8.125 1x11.125 1x13.125



2x 77.625/78 - 7 - 1x6 1x9.75 2x11.125 1x13.125 2x13.25



1x 77.75/78 - 9 - 4x6 1x7.75 2x9.75 2x13.25



## Key takeaways

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- SCM: design, planning, execution, control, and monitoring of supply-chain activities
- Create a Digital twin of the current state of the Supply Chain
- Plan and orchestrate the future Supply Chain
- Differentiate between short, mid and long term planning
- Specific Algorithms and Solutions for different planning problems

