Customer Supply Chain

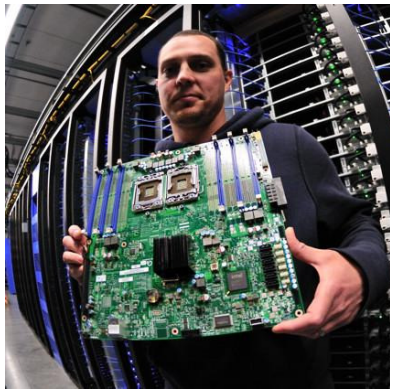
ASML Supply Chain Management (SCM)

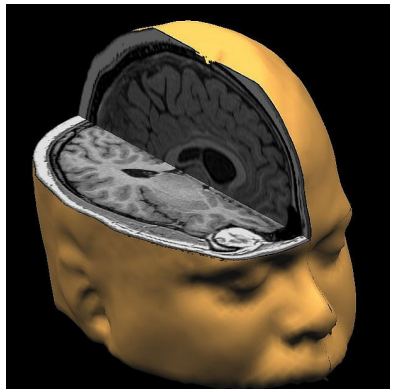
Veldhoven

Agenda

13:00 - 13:25	**Welcome and introduction ASML** ➢ Ben Gräve (SLF) and Piet Oomen (ASML)
13:25 - 13:45	**Service Supply Chain of ASML** ➢ Ruud van Sommeren (ASML)
13:45 - 14:15	**Service Supply Chain Control Tower** ➢ Jacky van de Griendt (ASML)
14:15 - 15:30	**Guided Tour ASML experience center**
15:30 - 15:45	**Break**
15:45 - 16:30	**Control Tower developments in the Service Chains** ➢ Prof. Henk Zijm (University of Twente)
16:30 - 17:00	**Discussion**
17:00 - 18:30	**Drinks (PLAZA)**

It’s hard to imagine a world without chips



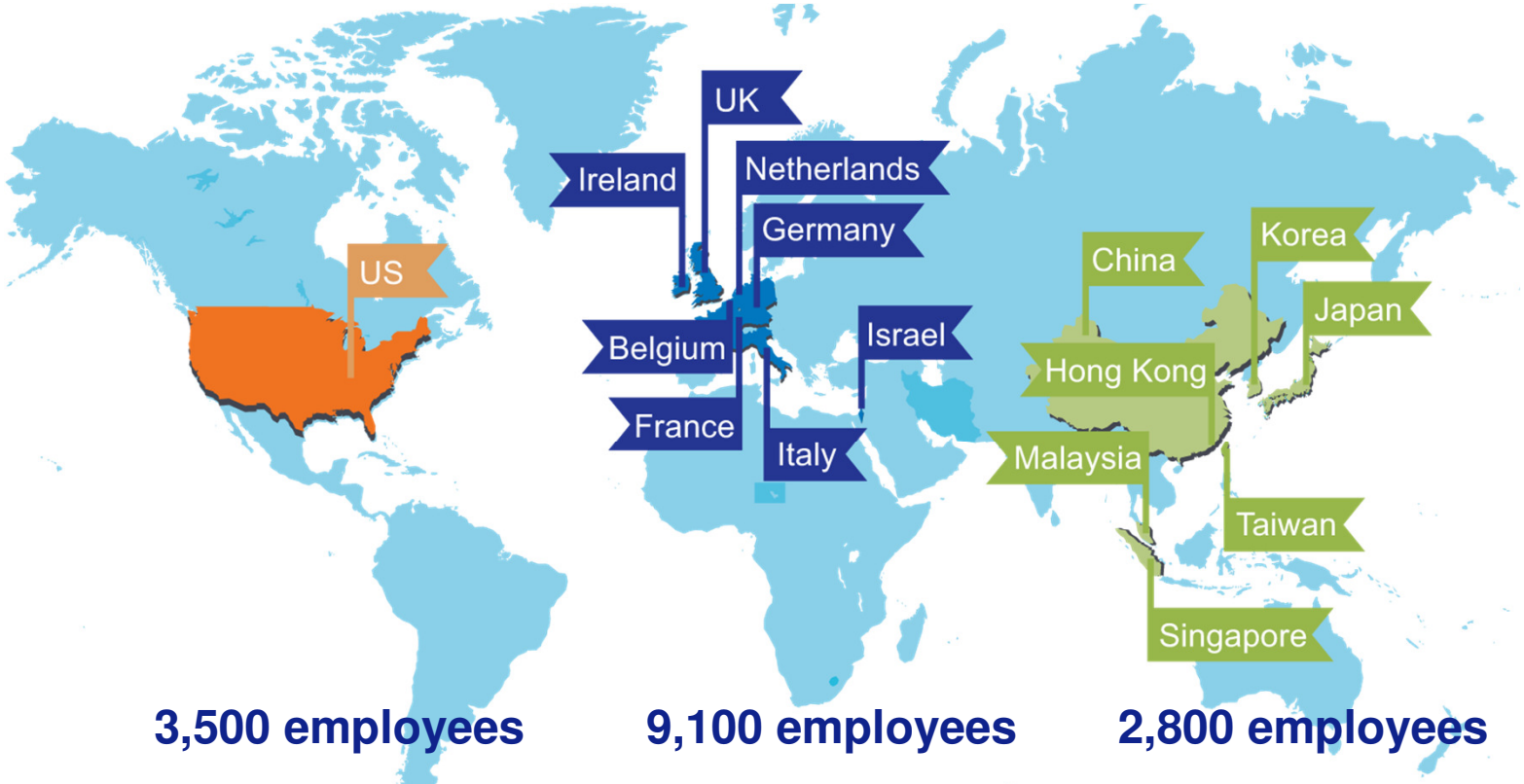


ASML makes the machines for making those chips

- Lithography is the critical tool for producing chips
- All of the world's top chip makers are our customers
- 2015 sales: €5.9 bln
- More than 15,000 employees (FTE) worldwide

Founded in 1984 as a spin-off from Philips

A global presence



3,500 employees **9,100 employees** **2,800 employees**

Over 70 sales and service offices located worldwide

Source: ASML Q3 2016

A global presence

Wilton (CT)

San Diego(CA)

Korea

Veldhoven

Chandler (AZ)

Taiwan

A market of 12 large ASML customers

Technology Partnership Award 2014

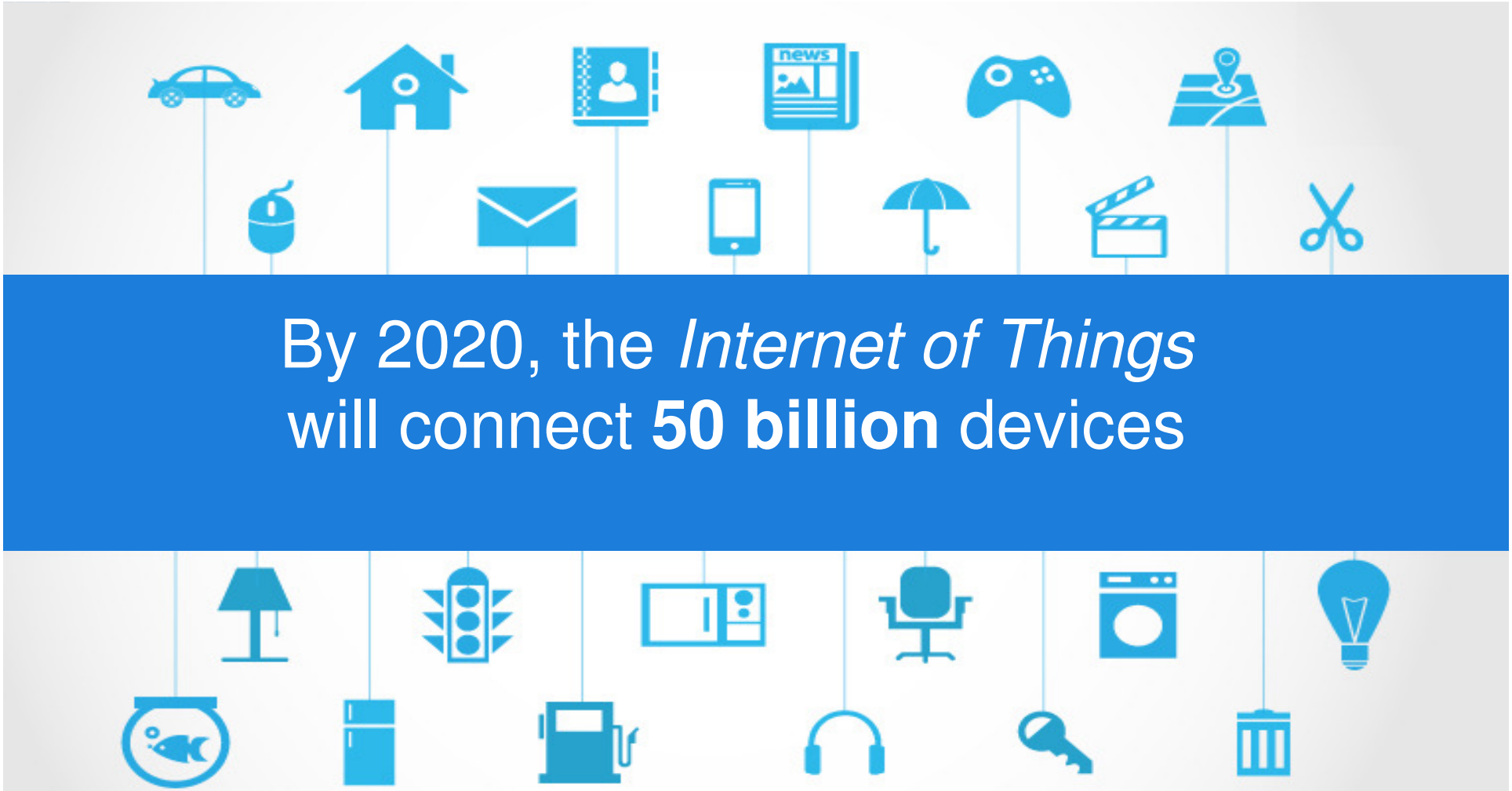
Preferred Quality Supplier Award 2014

'Best In Value' Award 2014

Top three with record 9.0 mark in VLSI's "BEST Chip Making Equipment" suppliers 2015

Company	2015 semi capex (est., $M)
Samsung	13,000
TSMC Group	9,000
Intel	7,200
SK Hynix	4,700
Globalfoundries	4,000
Micron Technology	3,800
Toshiba (incl. SanDisk)	3,095
Sony	1,991
Inotera Memories	1,836
United Microelectronics Group	1,800
SMIC Group	1,500
Infineon Technologies	896

Source: Gartner, Q3 2015



Source: data from Intel (IDC 2014), artwork from Salesforce, Stuart Leung, Forbes (August 2014)

ASML

Customer Supply Chain Management

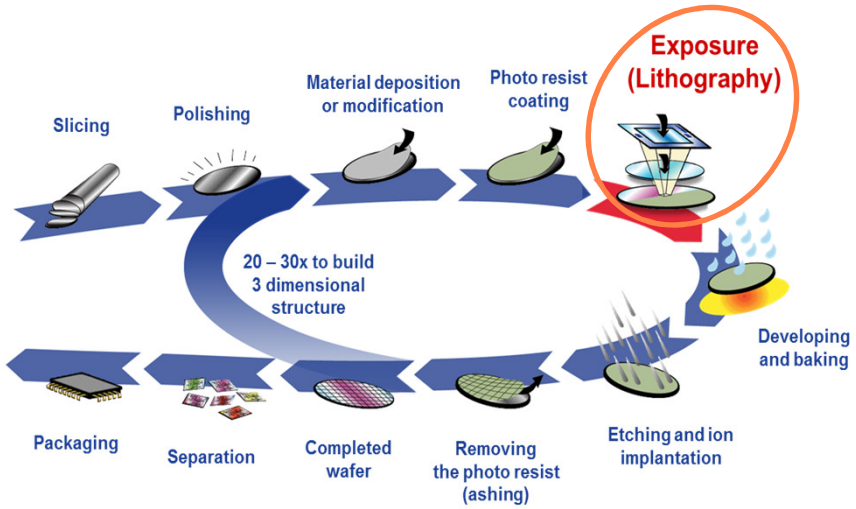
Ruud van Sommeren
Veldhoven

ASML Supply Chain

The world our customers operate in…

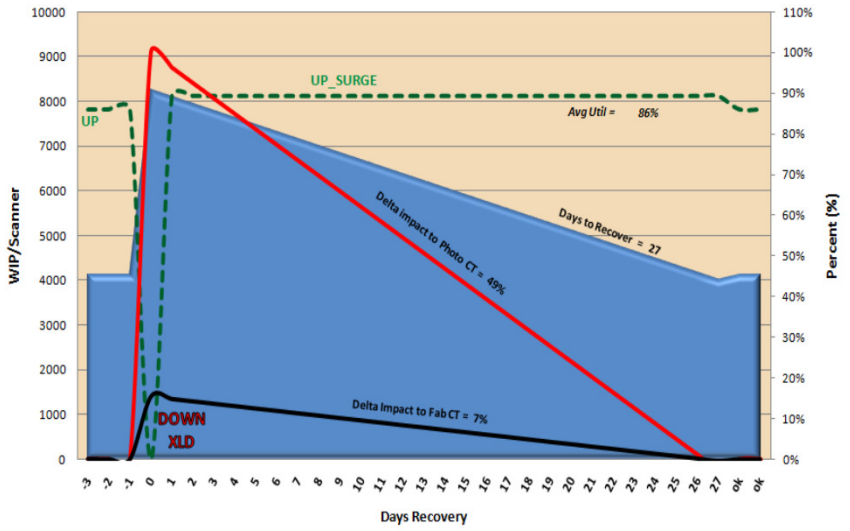
Material availability critical factor in customer operation

Customer production process



- Semiconductor fab up to 9B$ investments
- Customers have build their fab around our Litho equipment

Customer impact



- Every second of system availability translates into an opportunity for our customers of 20$
- Customer example: impact of NXT 24hr down, WIP recovery takes up to 27 days

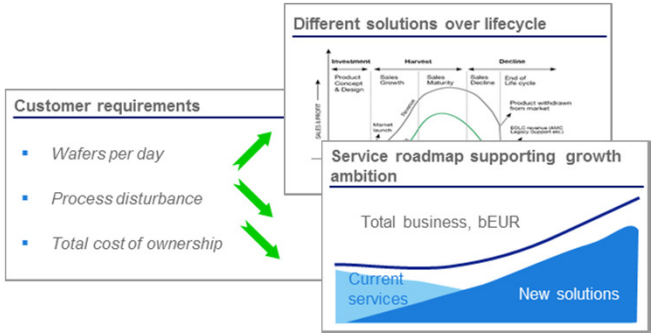
Customer Supply Chain Management

Develop and deliver solutions to support Service Business growth ambition

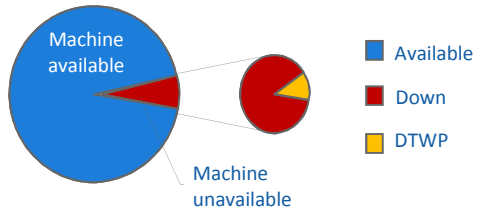
Vision

- Develop and deliver Supply Chain service solutions that fulfill the differentiated **customer requirements** over the product life cycle and contribute to BL service business ambition
- Be the **Supply Chain partner** for our key customers which is **recognized** for delivered solutions and common future goals

Service roadmap enabling BL service ambition



Deliver service solutions



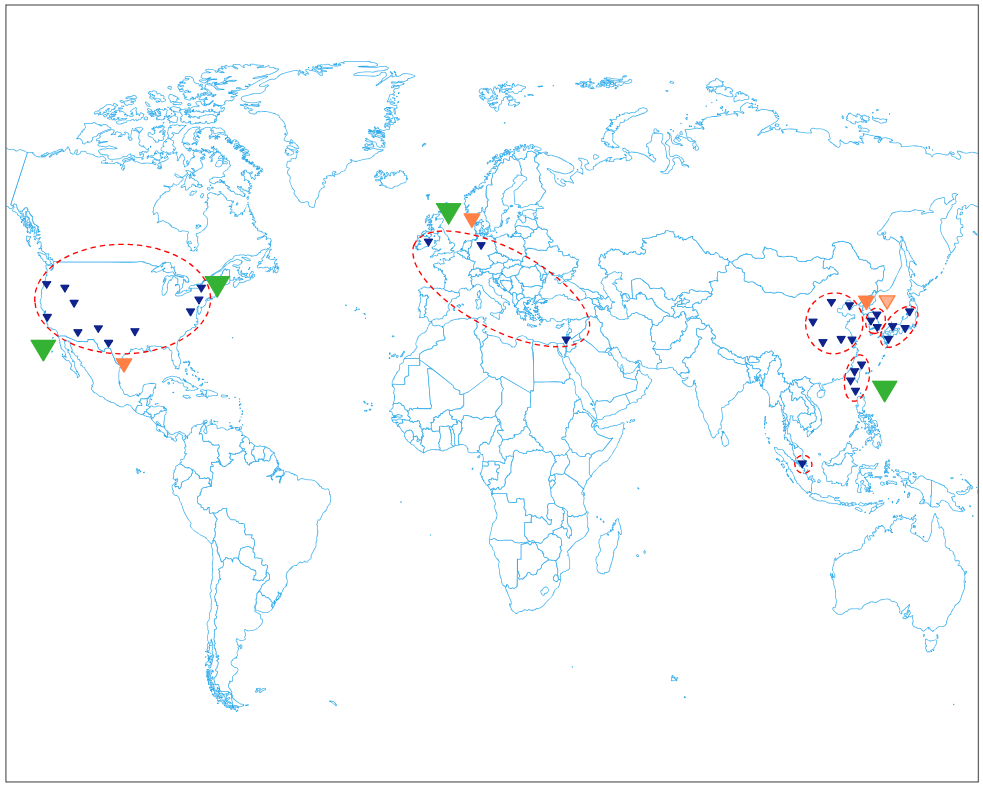
Downtime Waiting for Parts specifies the number of minutes per week a system is not available to run production waiting for parts

Differentiated service solutions

Service recognition from customers

Customer Supply Chain

Supply Chain infrastructure organized around our customers

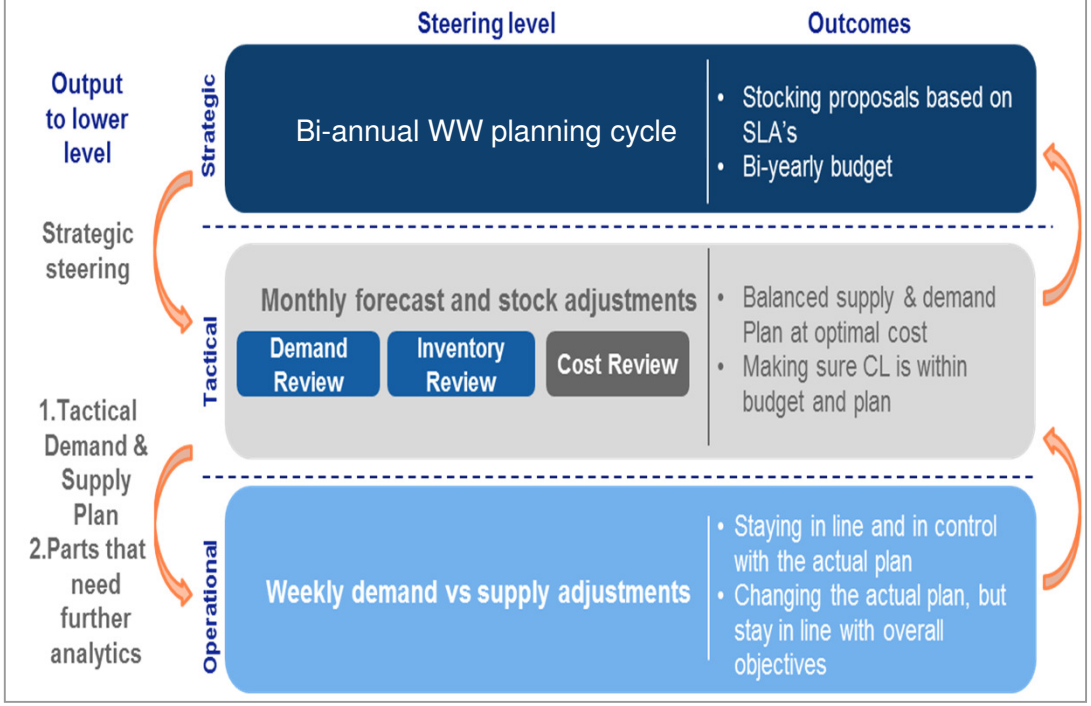


- 55 Customer fabs and ASML warehouse locations across the globe
- 100 customer SLA's with different DTWP commitments per fab and/or platform
- 4,500 machines, non identical
- 12,000 parts, no failure info on new parts
- Commonality between platforms, with different usage patterns
- Supplier leadtimes 1-12 months
- Parts prices between 0.05 and >1M Euro

Control Tower is leading in planning and execution

Demand, supply and cost managed on 3 levels, activities done on a fixed frequency

Control tower framework



Analysis and actions

Bi-annual planning cycle
- Review BL usage roadmap, set planning usage parameters
- Customer service roadmaps
- Cost norms evaluation

Monthly Demand and inventory review
- Make decisions on demand, inventory and costs on the mid long run
- Review contracted install base
- Assess and adjust forecast accuracy

Weekly/ Daily monitoring mechanism
- Internal alarms and containments: Actual demand is not matching supply
- Critical parts management.
- Monitor progress (reporting, KPI's review)

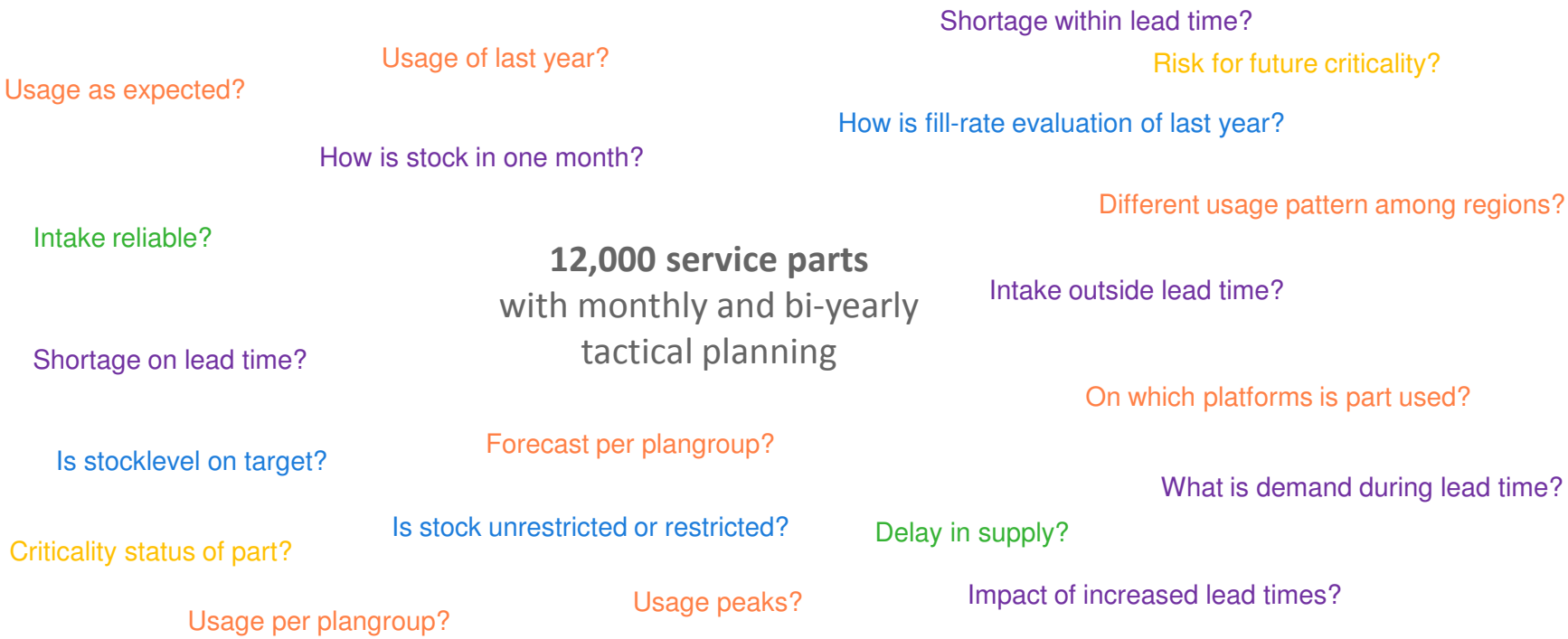
ASML

Operational Control Tower

Jacky v/d Griendt
Veldhoven

Spare part network with 12,000 service parts

Monitoring required to guarantee service level to customer

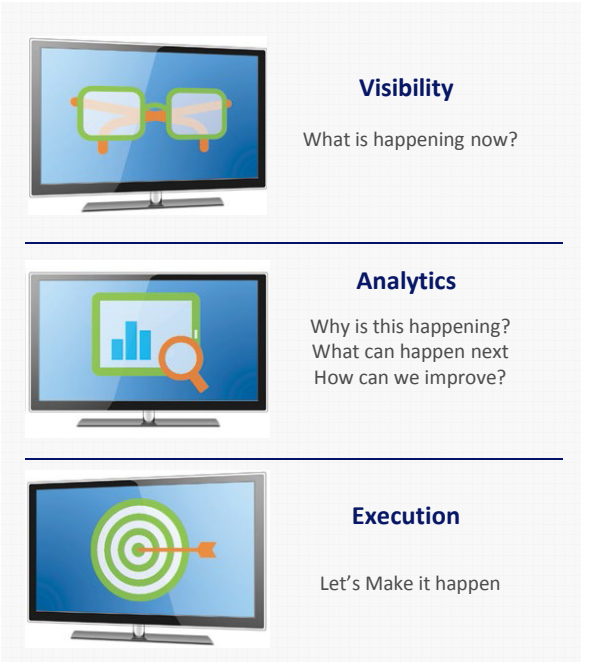


Control Tower

Aggregates data into one single dashboard which provides visibility and makes analysis and excection possible

Control Tower

- Demand
- Supply
- Fill-rate
- Stock
- Criticality



High level analysis “Control Tower”

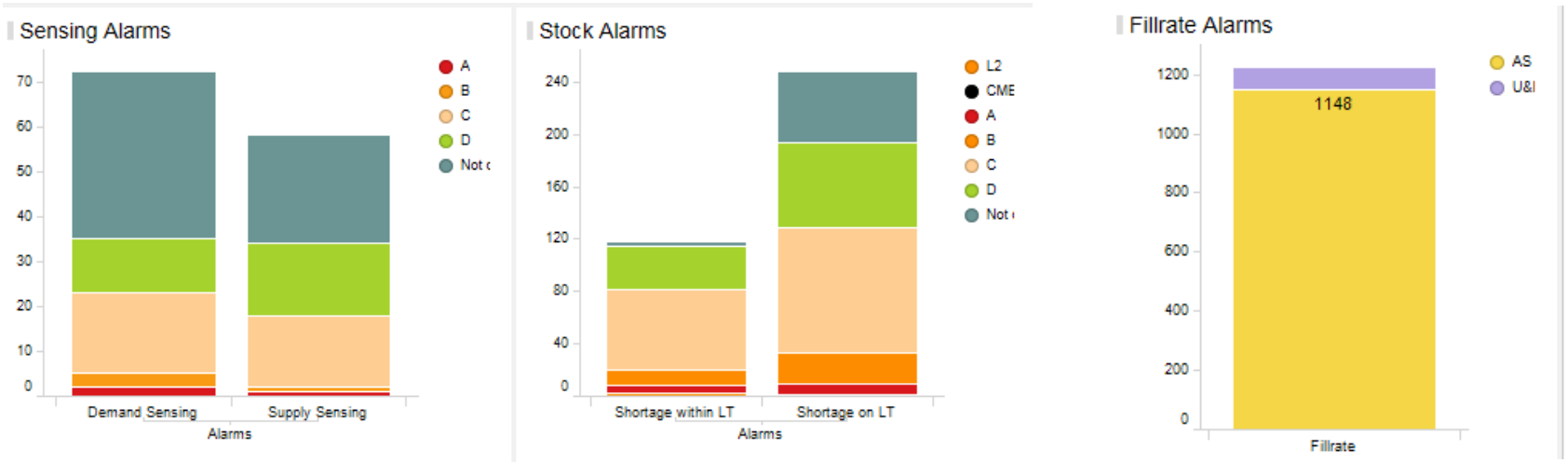
Various modules of the Control Tower Dash Board

1. Demand issue
2. Fill rate
3. Supply issue
4. Future availability issue

12,000 service parts to monitor…….

How to select the service parts that need attention?

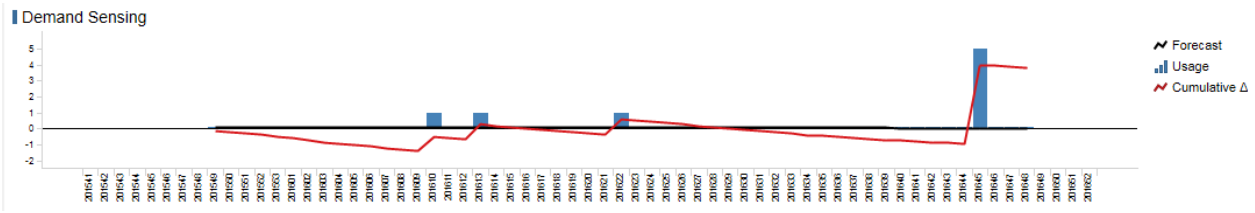
Focus on parts triggered by an alarm



Control Tower Alarms

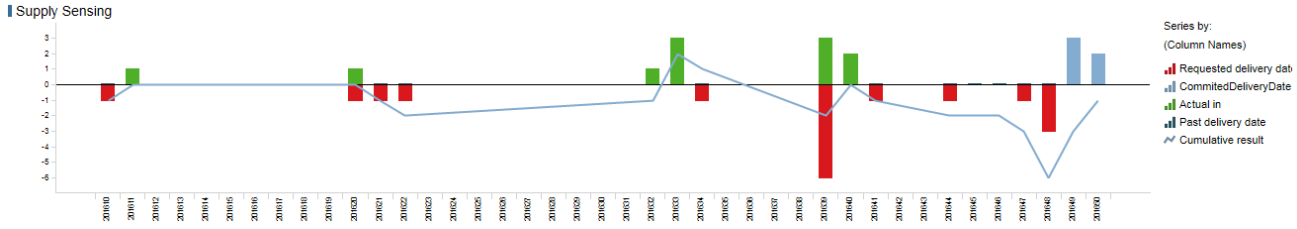
Service parts that require analysis and action to prevent parts becoming critical

Demand variability



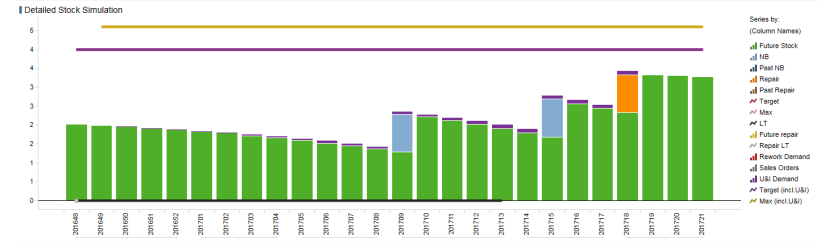
When the cummulative demand variability line is structurally increasing, this indicates we are using more than planned and shortages are to be expected

Supply variability



When the cummulative supply variability line is structurally decreasing, this indicates supply is coming in later than we planned for and shortages are to be expected

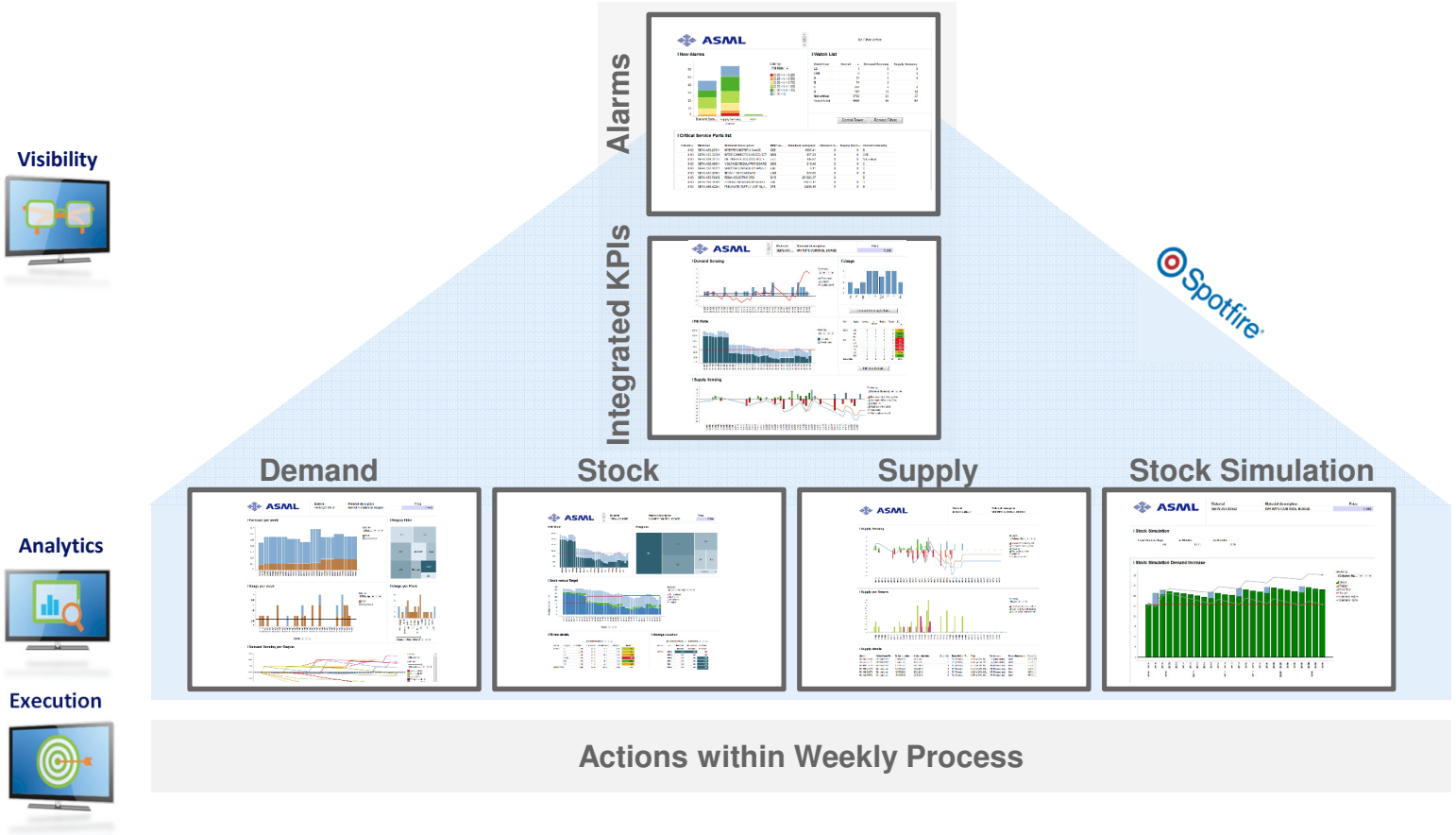
Shortage within LT → future criticality



When a part has a shortage within LT, re-in of the supply is required to prevent the part from becoming critical

Operational Control Tower

The dashboard is logically structured to maximize the efficiency of the process



Control Tower Execution

Multi-disciplinary collaboration

Acting on issues in planning and preventing them in future

Forecast Analyst

Tactical Planner

Exception Handling Project Lead

MRP controller

Exception Handling analyst

Point of contact USA

Modifications

Point of contact Taiwan

Point of contact Malaysia&Singapore

D&E

Point of contact China

Point of contact Europe

Point of contact Japan

With the Control Tower we can…..

- Weekly verify assumed demand and supply parameters used in monthly and bi-yearly tactical planning cycles
- Act on unexpected events, e.g. earthquake in Taiwan lead to usage increase, however should be excluded from usage forecast
- Visualize supply chain interruptions to support re-in and re-out actions (help supplier making decision in case of capacity issues)
- Track actions that are set based on Control Tower data and see actions performed in the past

Thanks for your attention!

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