

Industrial Challenges

SHTE Conference
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Vice President

Global Industrial Development



Strategy – focus on customer profitability



Scania's offering

- Provider of sustainable transport solutions
- Long-term commitment
- Premium product and services

Premium products and services



Haulage



Construction



Distribution



Special purpose



Network and services



City and suburban



Intercity and coach



Scania
approved

Used vehicles



Engines



SCANIA

125 years of industrial history

- | | | | |
|-------|-----------------------------------|------|--|
| 1891 | Company founded | 1976 | Factory in Argentina |
| 1897 | First car | 1992 | Factory in France |
| 1900 | Scania was established in Malmö | 1993 | Factory in Poland |
| 1902 | First truck | 1995 | Factory in Mexico |
| 1905 | First industrial engine | 1995 | Independent company |
| 1911 | Scania and Vabis merge, first bus | 1996 | Scania a public company |
| 1921 | Bankruptcy | 2000 | Factory in St Petersburg, Russia |
| 1930s | Buses main product | 2008 | Subsidiary of Volkswagen |
| 1934 | Last red figures | 2010 | New R-series is “Truck of the year” |
| 1940s | New strategy | 2011 | 100 years since the first bus delivery |
| 1948 | General agent for Volkswagen | 2013 | Launch of Scania Streamline and complete range of Euro 6 engines |
| 1950s | Exports started | 2014 | Scania became a wholly owned subsidiary of the Volkswagen Group |
| 1957 | Factory in Brazil | 2016 | Launch Next Generation Scania |
| 1964 | Factory in Netherlands | | |
| 1969 | Saab and Scania-Vabis merge | | |



New Generation Scania



The new King



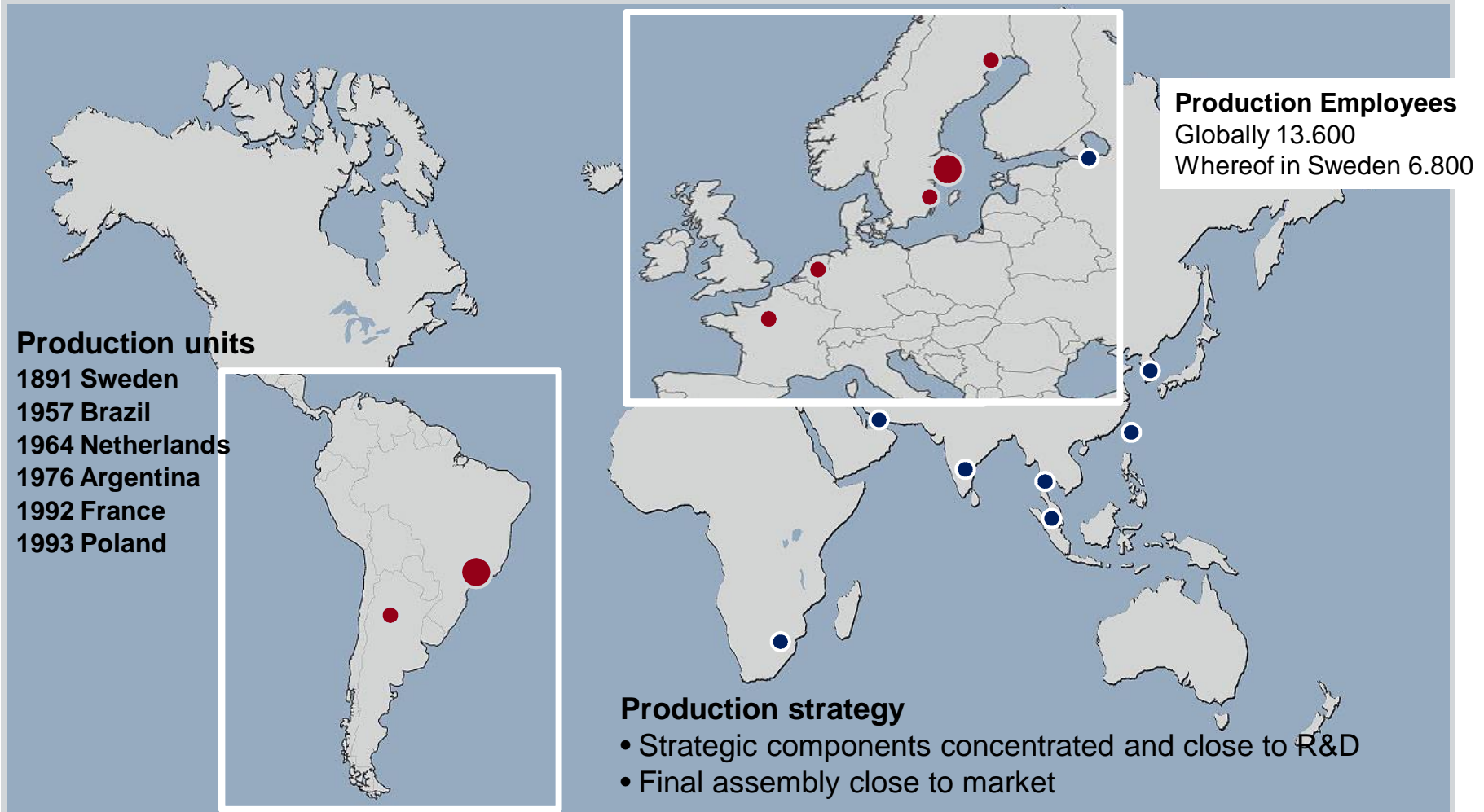
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Scania Production & Logistics



Scania Global Manufacturing System

- Production units
- Regional Product Centres





14.000 employees in Södertälje
Production of Strategic components
R&D
Sales & Marketing



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Everything in one place

Production and Logistics



**Research and Development,
Purchasing**

Sales and Marketing



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Co-located resources

Strategy to co-locate resources

- Short lead time and Close contact
- Good understanding of different business areas and competences
- Knowledge and Experience in place and available
- Direct access to experts in real time
- Common infrastructure
- Good prerequisites for Design for Manufacturing

Södertälje, Sweden

- Concentrated production of all strategic components
- All R&D
- Sales and Marketing



Production in Sweden - prerequisites

- Accessibility to skilled employees. World-class national competence in relevant areas
- Rules and Regulations that gives flexibility - Quick adaptation to changing needs
- Production systems that provide continuous improvement - need of continuous productivity increases



Key to the future



**Access to competent
employees**



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TRM P&L 2035

Technology Road Map Production & Logistics



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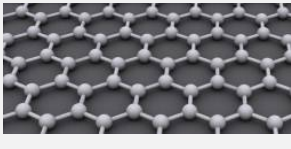


Why do we need a Technology Road Map?

- Prepare for different possible futures
- Identify which competence will we need
- Secure access to the needed knowledge and expertise
- Communicate areas for research to external partners

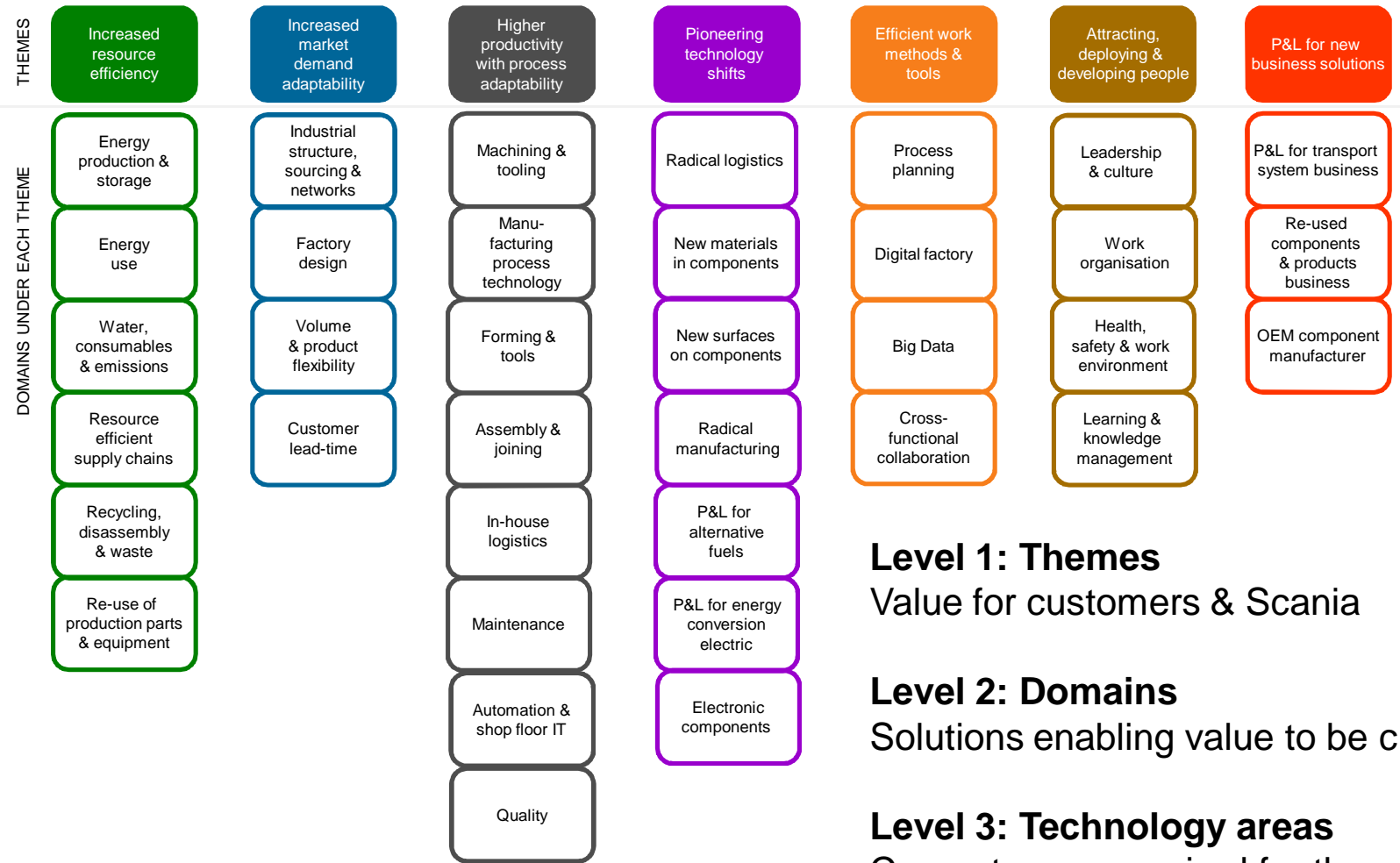


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The future world for P&L 2035

TRENDS		UNCERTAINTIES	
Power shift from west to east		Geopolitical tension and regional conflicts	
Population growth & urbanization		Economic growth and market volatility	
Ageing workforce in Europe		Speed of technology change for powertrain	
Big data / smart factory		New materials and access to rare metals	
Increasing effects from climate change		Role of IT and digitalization in work	

P&L TRM – Themes and Domains

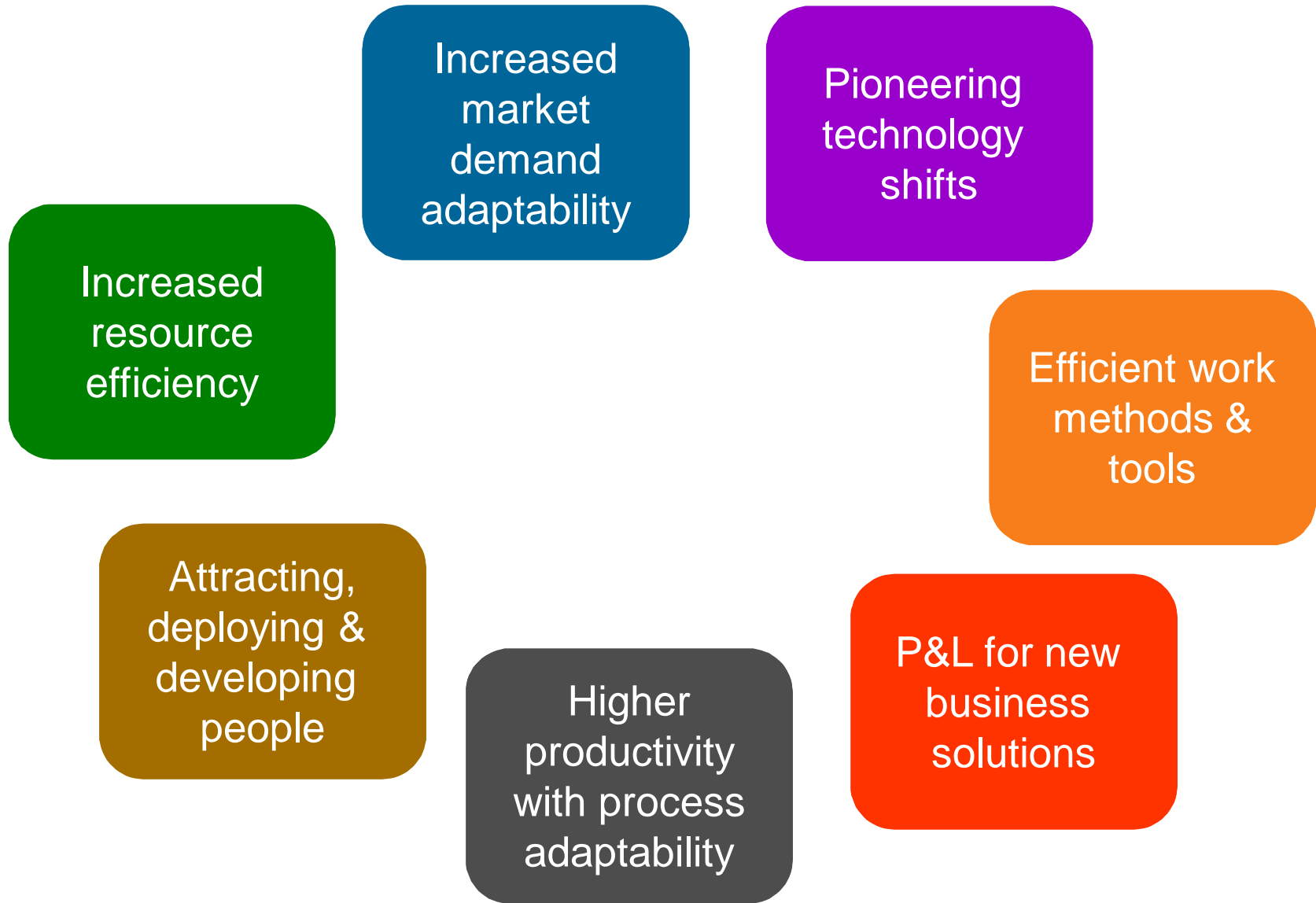


Level 1: Themes
Value for customers & Scania

Level 2: Domains
Solutions enabling value to be created

Level 3: Technology areas
Competences required for the solutions





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Smart Factory



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Data – a hidden resource

- A hidden resource in the manufacturing industry is data.
- **85%** of the data is still unstructured, **42%** of all transactions on paper.
- Data should be transformed into information to be used for making decisions.
- Reduced waste of material, capital, energy and media is necessary.
- Increased need for strategic data management



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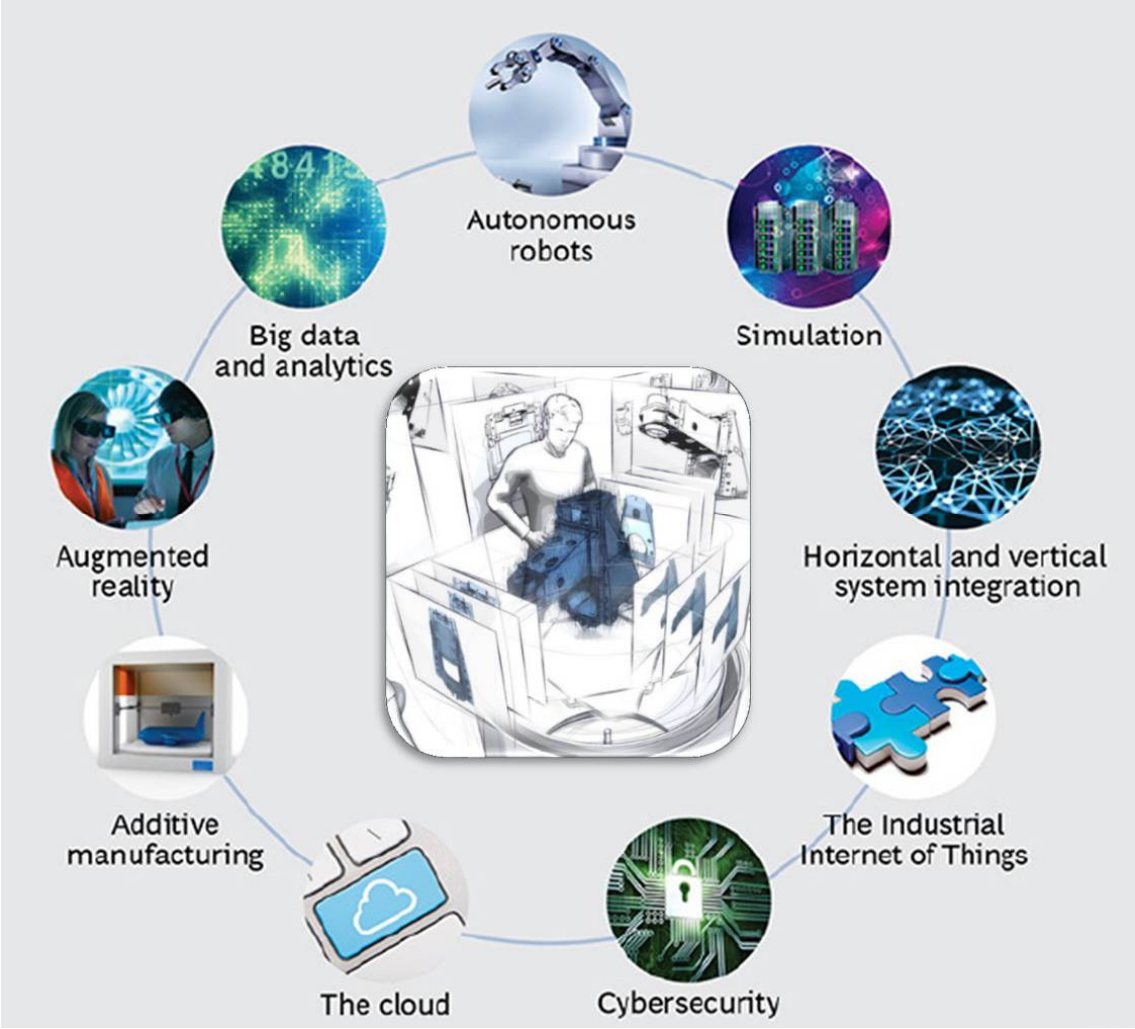
Drivers of change

- The low price of digital sensors and data storage
- The huge amount of information now available
- Advances in 'big data' software tools
- Advances in analytic techniques
- Data Mining provide the means to understand the massive quantities of data generated by intelligent devices.



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Examples of areas within Industri 4.0



Major challenges

- Safety



- Cyber security



- Standards



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Definition of Smart Factory – Digitalization

Predictable
future

Data analysis

Data gathering

Connected technology

”Flexible” standardized processes



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Smart Factory at Scania



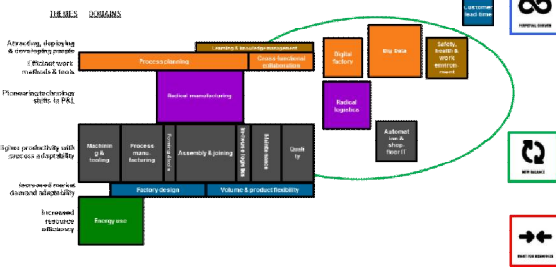
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Road Map Smart Factory Digitalization

Smart Factory Vision

A connected manufacturing engineering and operational environment for predicting and optimizing processes

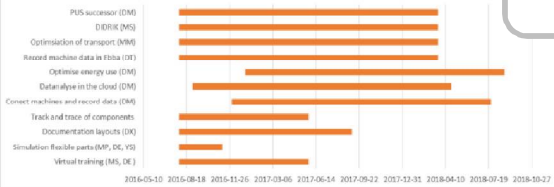
Technology roadmap related to Smart Factory



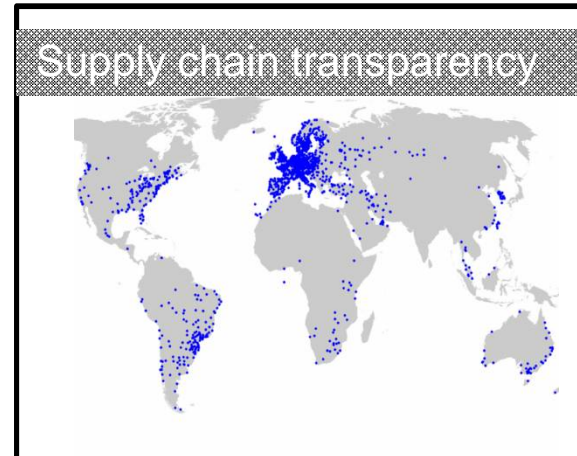
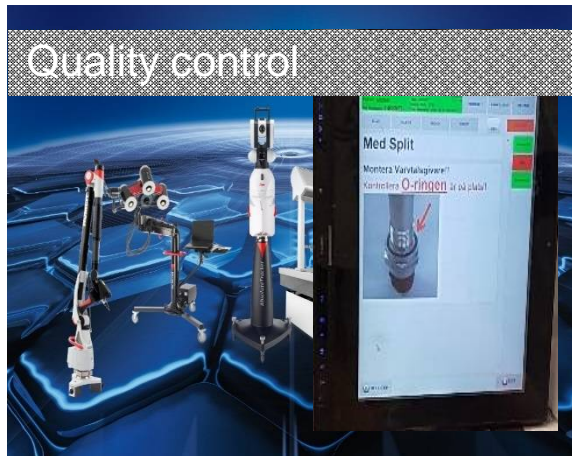
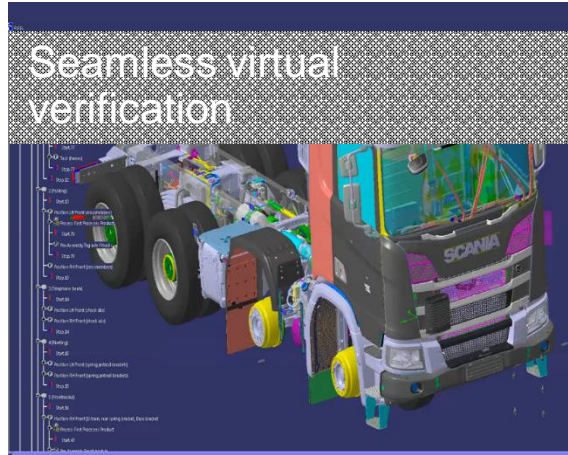
Ongoing activities and plans



Nummer	Område	Titel	Nummer	Område	Titel
1	DF	Project structure originates from OAS	33	Mant	UI-system
2	DF	OAS structure sent to ENOVA	34	Mant	Data från sensorer
3	DF	ENOVA brevidden i DELMA	35	Mant	Körning
4	DF	MCNA Assembly	36	Mant	Kvalitets säkerhet
5	DF	DELMA Process Engineer	37	Mant	Beställningslogi/Forecasting
6	DF	DELMA VS	38	Mant	En Fabrik/Systemtid
7	DF	Cloud	39	Mant	Intelligenta Testanalyser
8	DF	IPS	40	Mant	Reglering av funktioner som int
9	DF	Aux	41	Mant	Självdagsbaserade och
10	DF	Värmdo	42	Mant	Informationsdelning
11	DF	Virtual PLC	43	Mant	Självstyrande utrustningar
12	DF	Virtual Data Standard	44	Mant	Produktionsprojekt D&M
13	DF	Plant cloud / 3D Scanning	45	Shopfloor	Ebba
14	DF	Smart Glasses	46	Shopfloor	Adnan Toolset
15	DF	Service instruktioner	47	Shopfloor	DDRSK



Examples on application areas for Smart Factory with P&L



Smart Truck Production Laboratory

AGV/FTS transporting parts from logistics area to assembly line. Few installations exists at Scania.



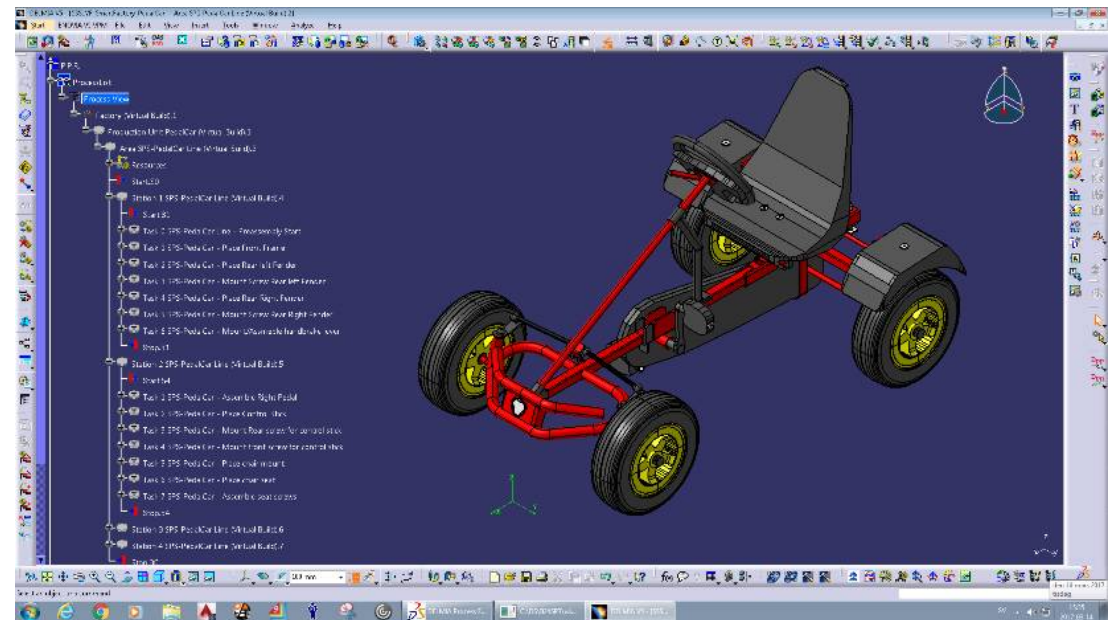
Smart glasses, pick by voice, pick by light and hand scanner technologies.





Robot in close cooperation with worker.
The robot is focusing on ergonomic difficult tasks.

Delmia viewer used as work support and instructions in early design phases.



New BiW factory in Oskarshamn



Facts new BiW:

285 Robots

35 000 m²

1400 m catwalk

1348 m track motion

1150 t armering

10 000 m³ concrete

210 welding guns

36 nut welding

28 gluing equipment

Cab factory of the future



TE Lars Henrik Jørring