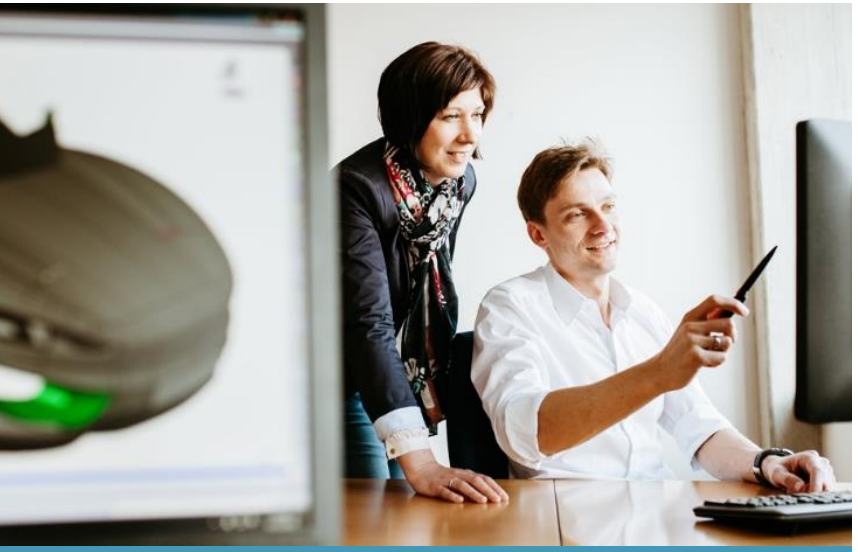
Magna Steyr

smartfactory
:BY MAGNA STEYR

Autonomous Production Systems - The Key for Agile Production?

Christoph Krammer
Technology Management Contract Manufacturing

Magna Steyr – Range of Services



Engineering

From systems and modules to complete vehicle engineering

Contract Manufacturing

World Class flexible solutions from niche to volume production

Fuel Systems

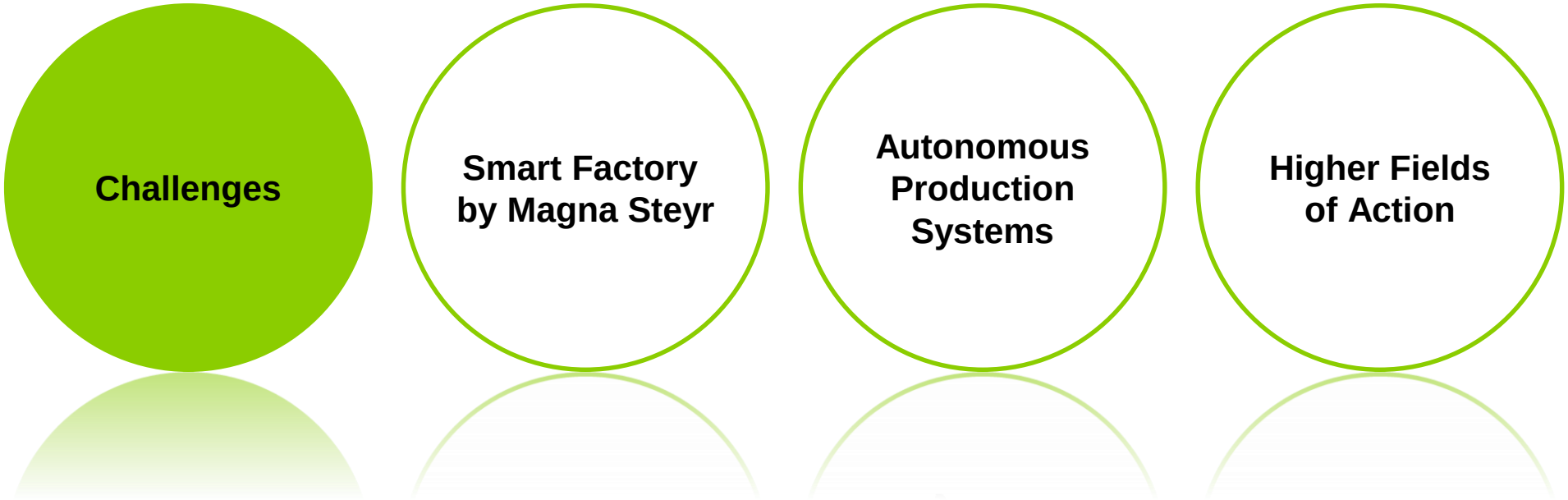
Energy storage systems made of steel, plastic and aluminum

Flexible and global solutions customized for the OEM

~10.000 Employees

33 Locations

Headquaters: Graz



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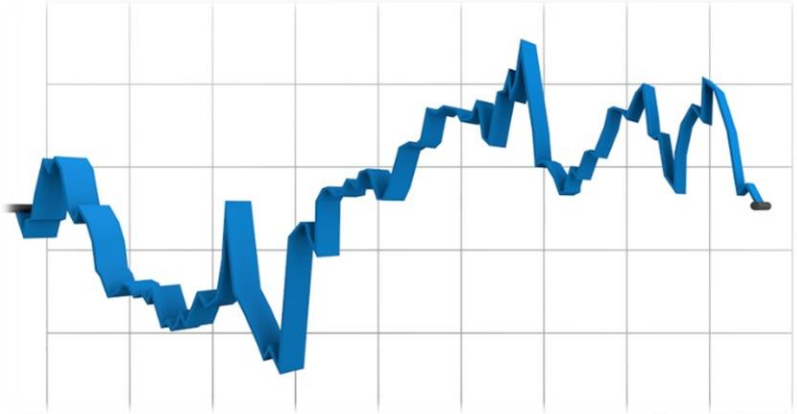
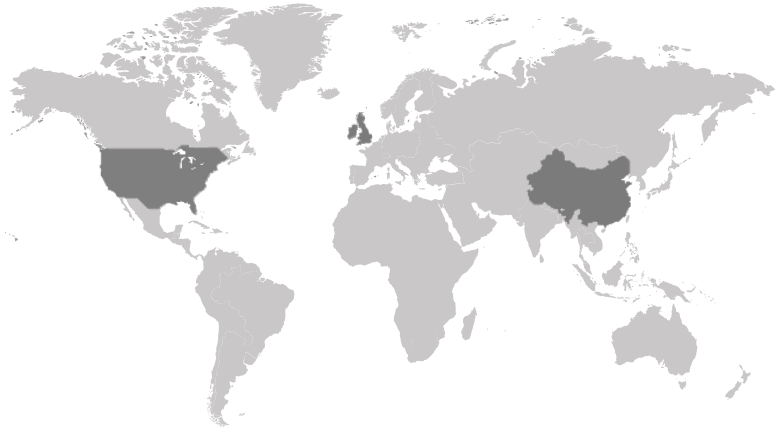
What are the challenges?

Volatile markets



Political and regional market changes



Increasing complexity & technologies

10^{25} = 10.000.000.000.000.000.000.000.000

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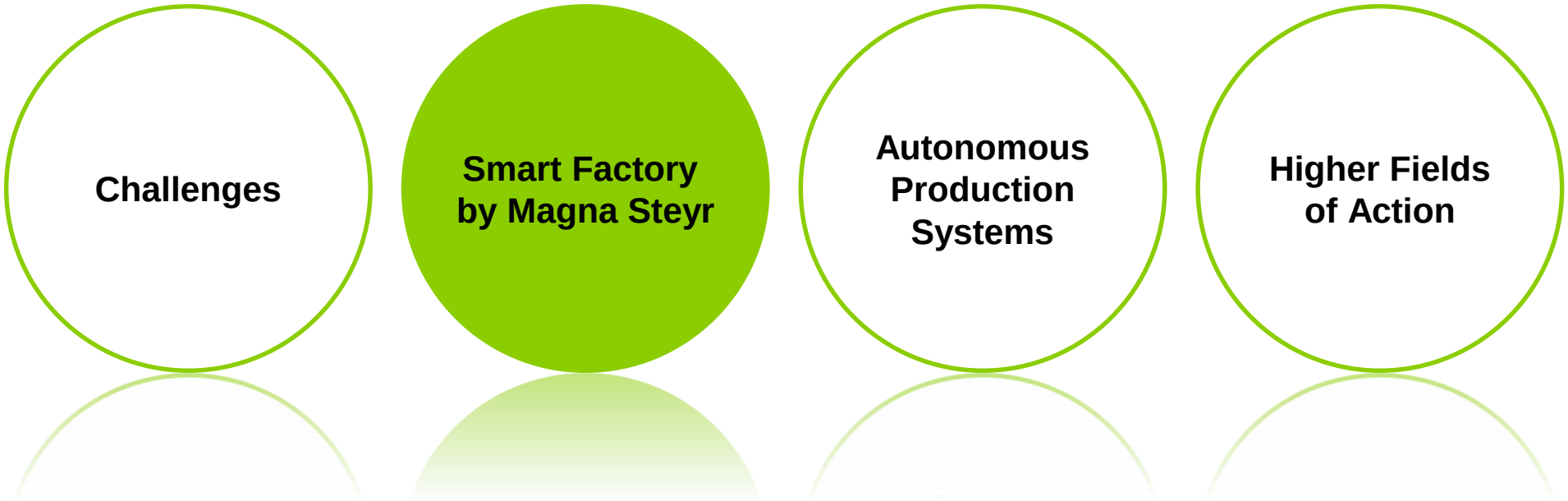

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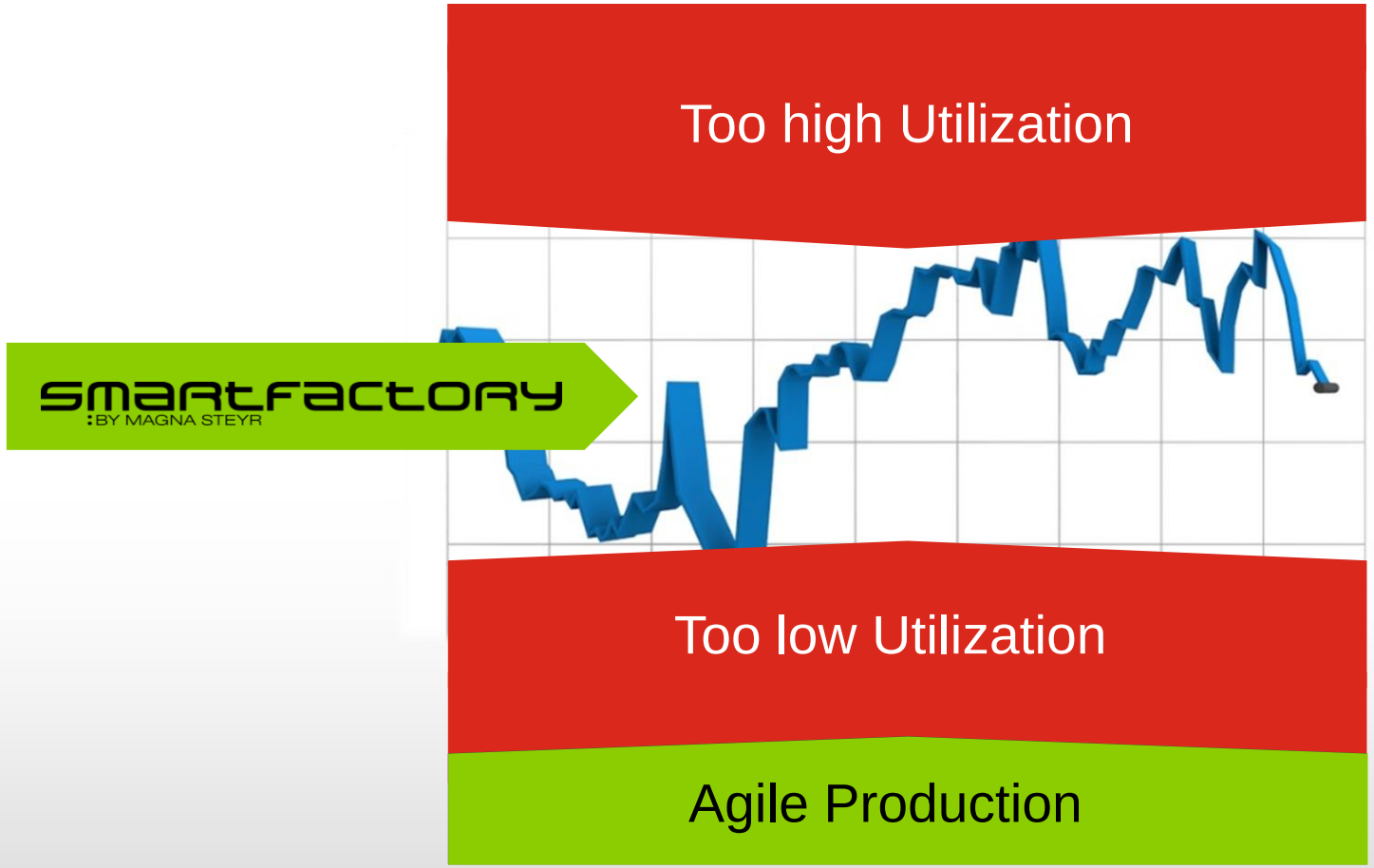
Agile Production as an answer to Volatile Markets



The vision is an implementation of an agile and versatile factory of the future.

The factory reacts dynamic to changes of volatile markets.

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How is Magna Steyr dealing with these challenges?

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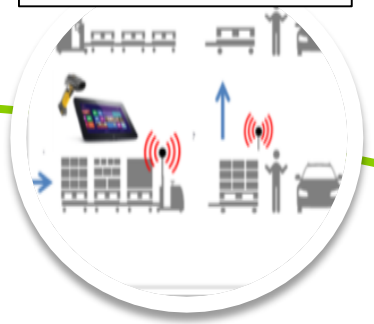
Applications – IN PREPARATION

Automated Intelligent Vehicle

Collaborating Robots

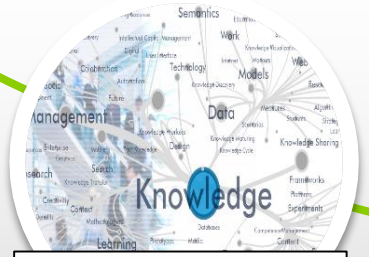
Intelligent racks

Digital C-Part-Process



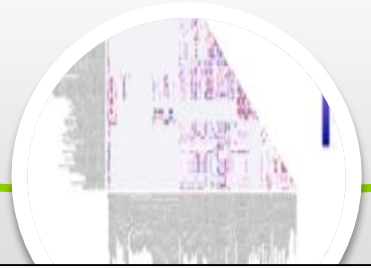
HMI

SMARTFACTORY :BY MAGNA STEYR

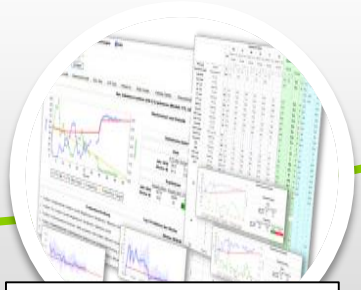


Knowledge Management

New Work Order



Big Data – Analytics Knowledge for Action



Operational Excellence

Exo-Skeleton Eco Ergo

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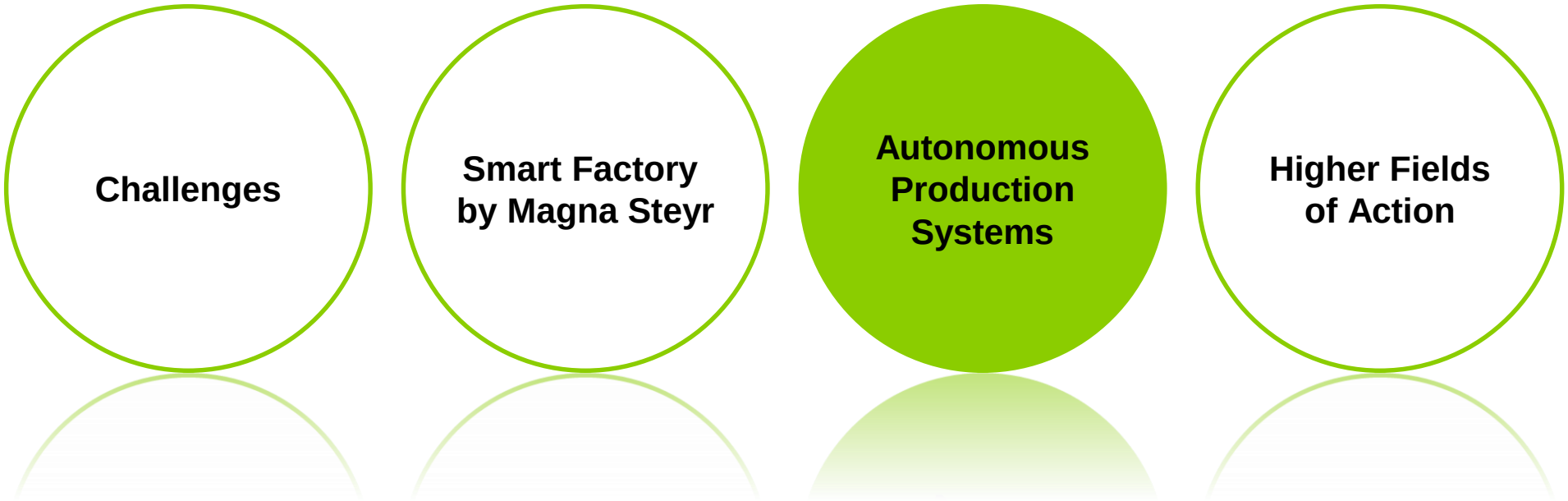

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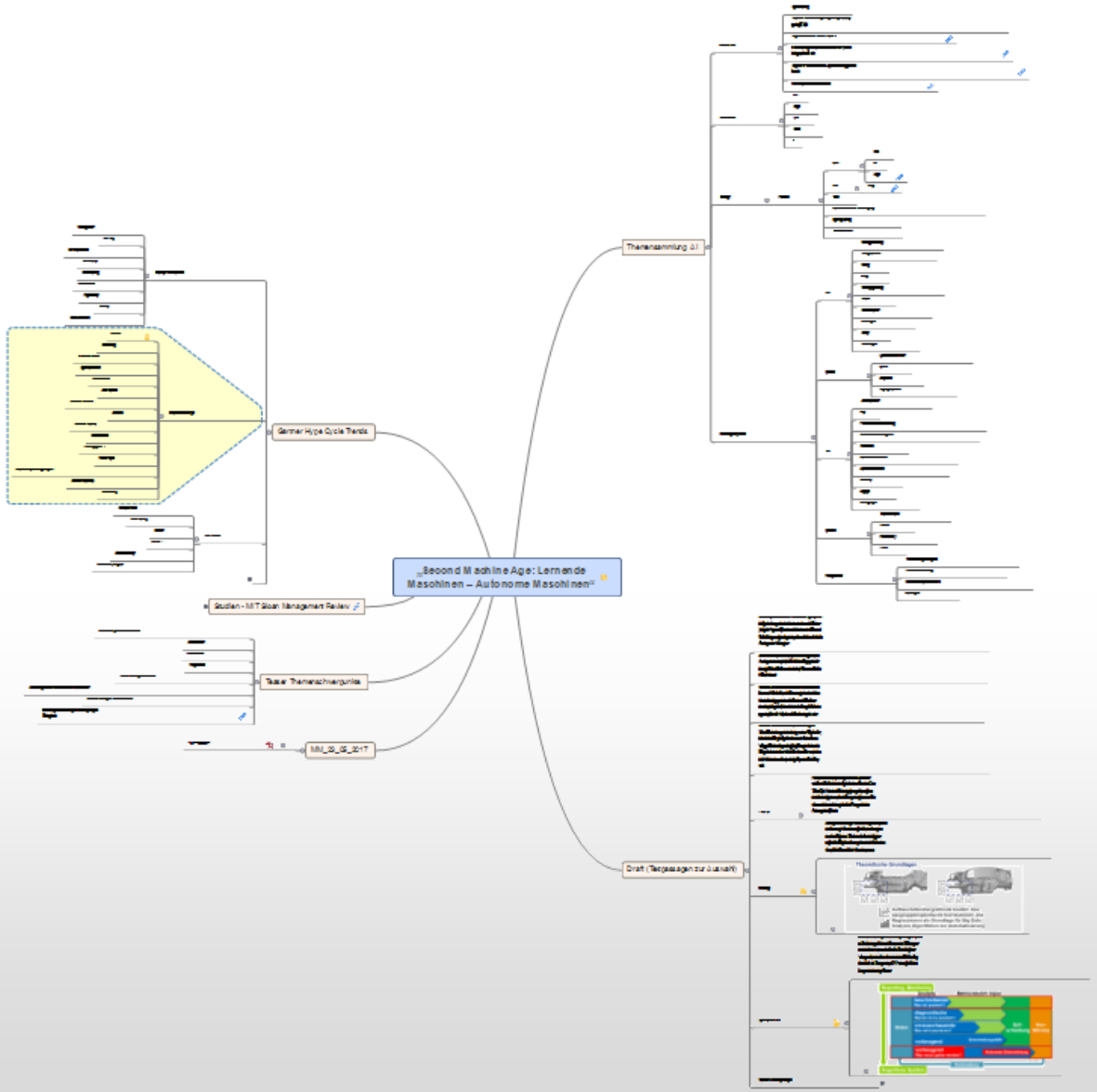
What are autonomous and self-regulating systems?



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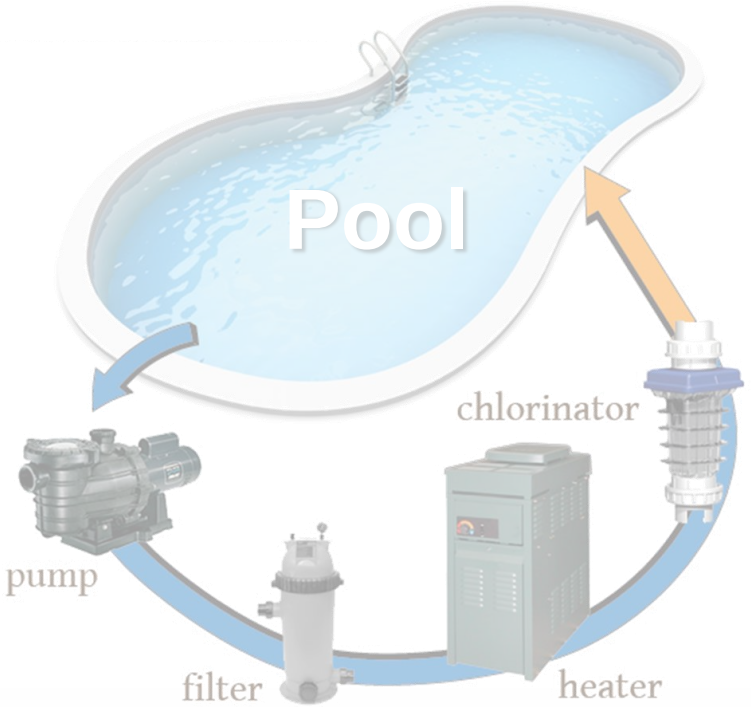
Are autonomous and self-regulating systems new?

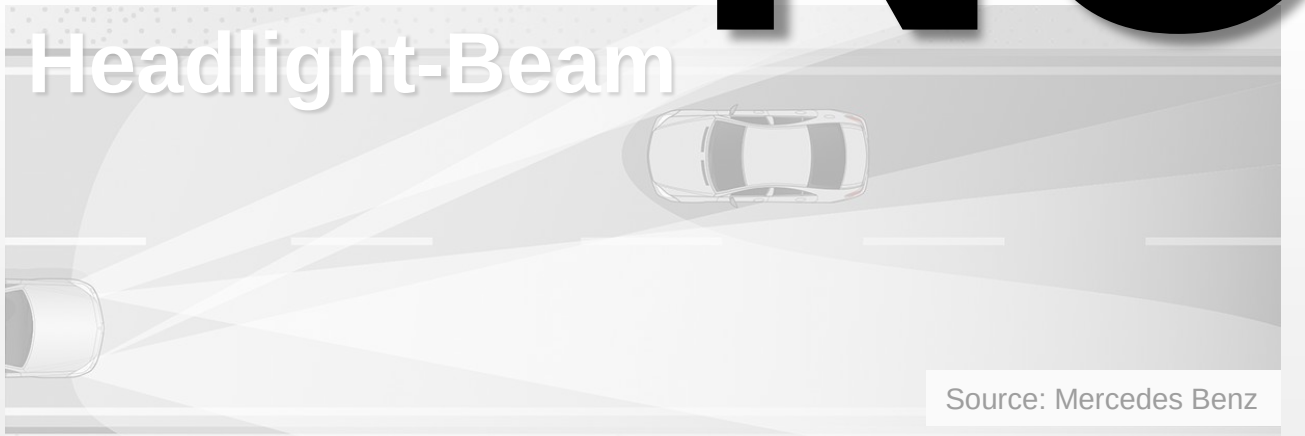


Source: www.swimmingpool.com

Sour Magna Steyr

NO!

Source: www.smartgreen.at



Source: Mercedes Benz

Source: Magna

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Dynamic Quality Inspection Planning

Advantages

- Event-oriented focus
- Target of the test plan at weld audit
- Automatic event documentation
- Problem solving

Fields of Application

- Dynamic test plan at weld audit
- Analog dynamic focus checks are possible at many production processes

Interaction Virtual/Real factory: Planning – Production – Quality

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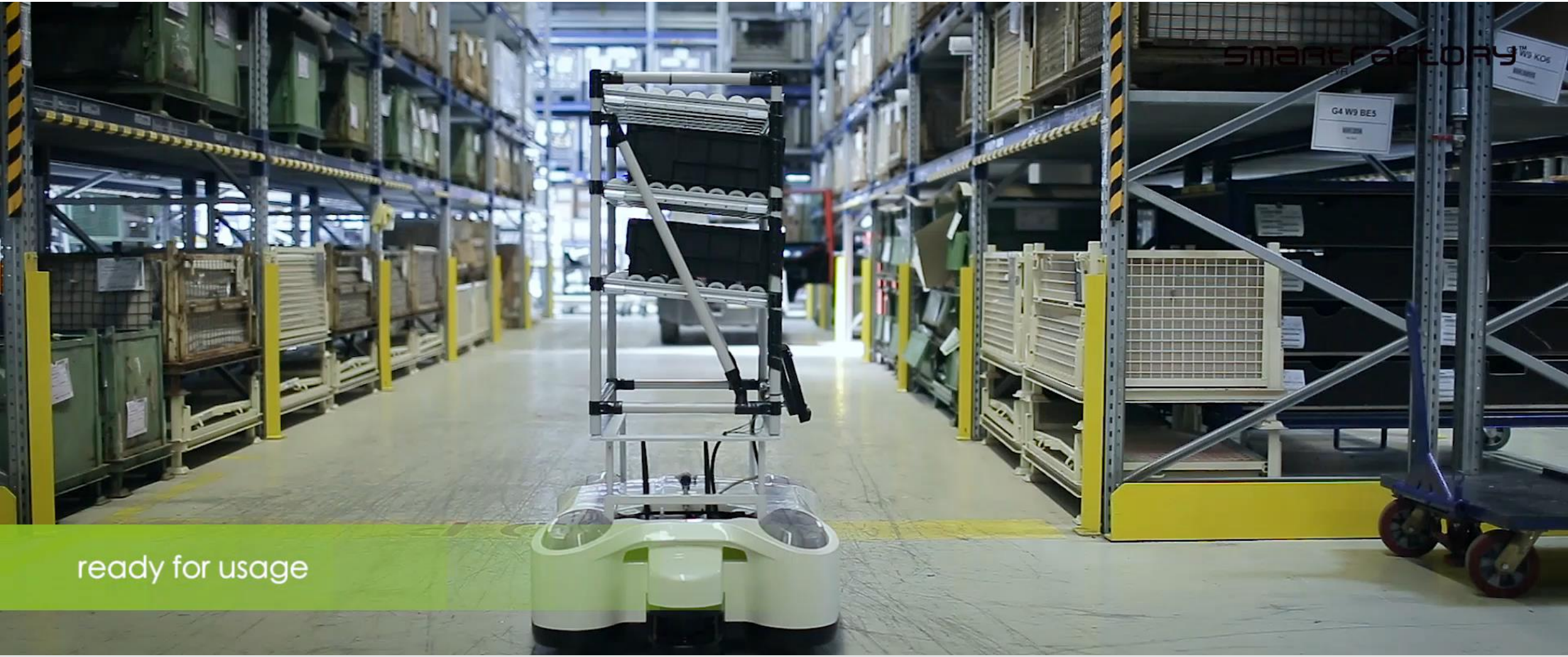
Automated Intelligent Vehicle

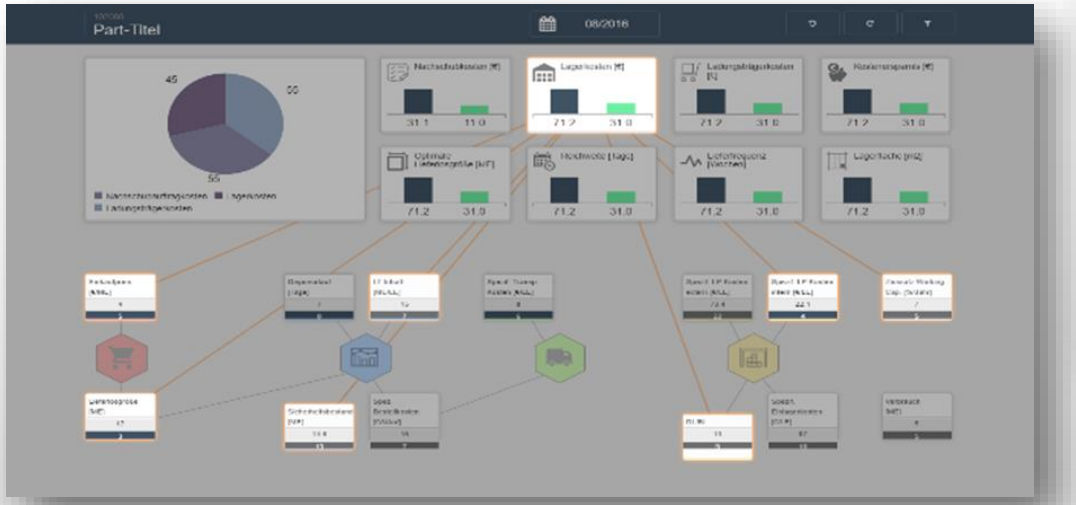


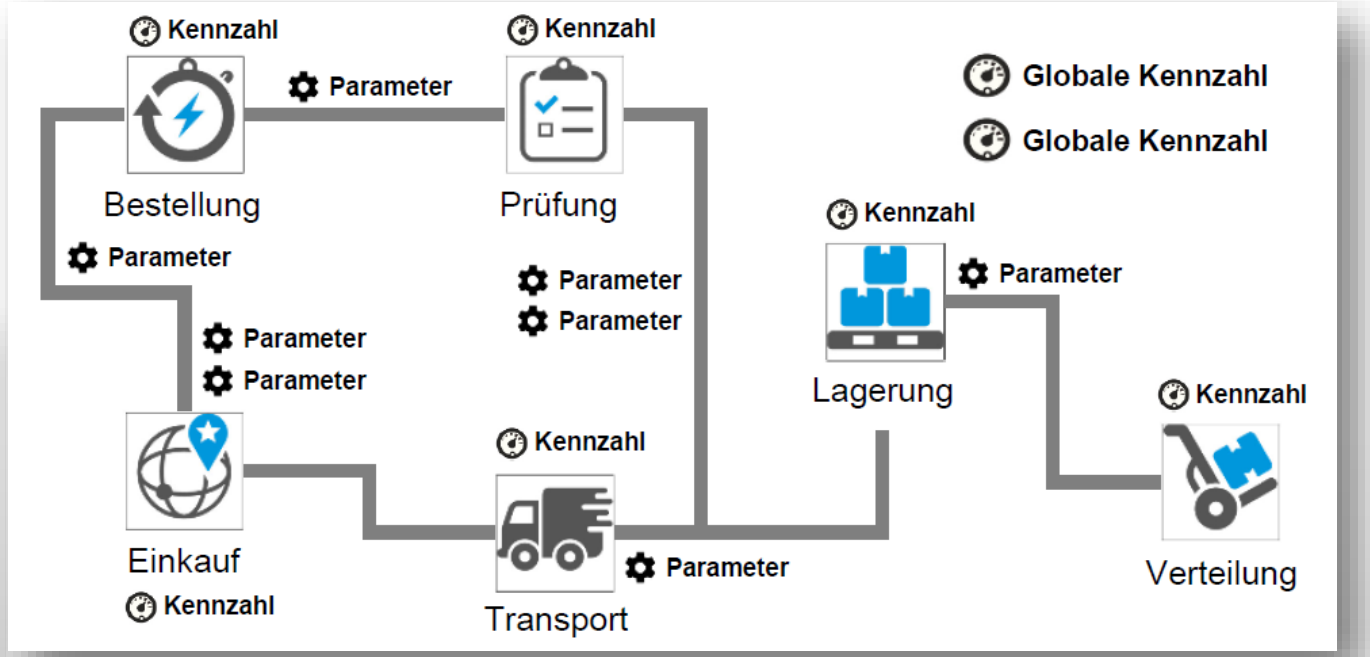
Automatic transport of parts, machines and product in a full-size flexible form

Big Data – Supply Chain Management Visualization

Features

- Total SCM process visualized
- Parameterized models
- Consequences on measures
- Overall scenario analysis





Predictive scenario visualization as a major step towards "prescriptive" and "automated decision making"

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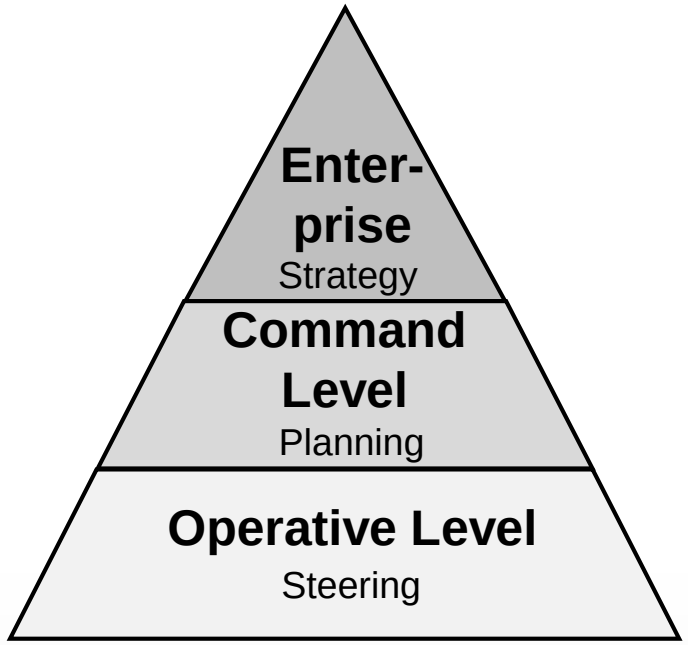
Transformation to Smart Factory

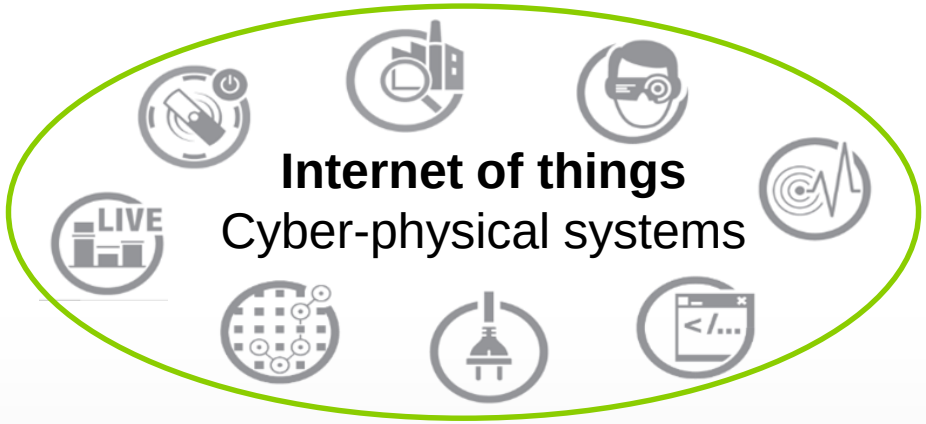
Conventional System



Transformation of organization

Migration of cyber-physical systems

SmartFactory / Industry 4.0



- Classic Automation Pyramid
- Organized hierarchical
- Deterministic
- System adaption by customizing
- Application specific solution

- Flexible and convertible
- Not deterministic
- High grade decentralized
- Multi-Agent steering
- Cloud-based

Smart Factory - necessary change of organization

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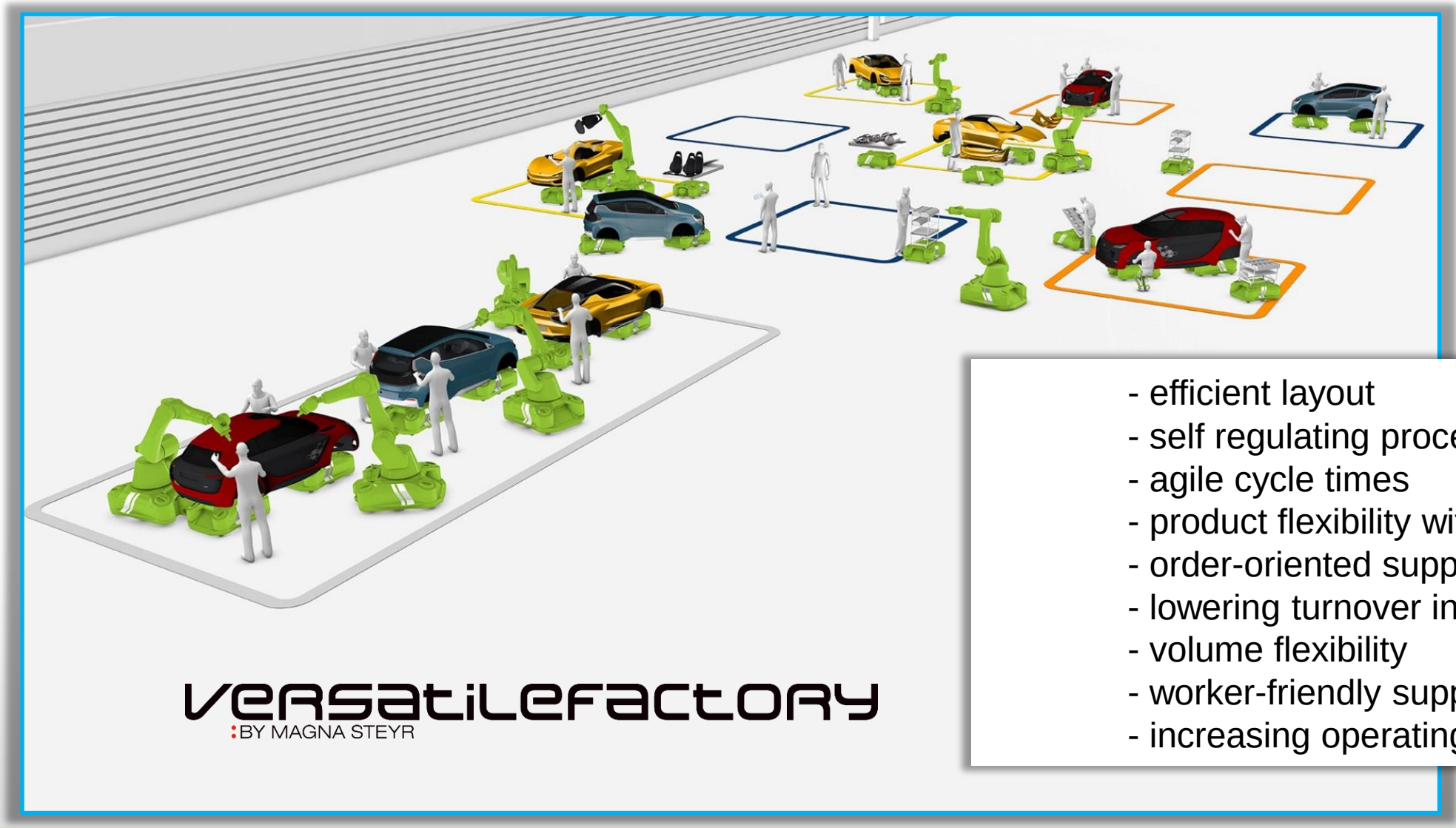
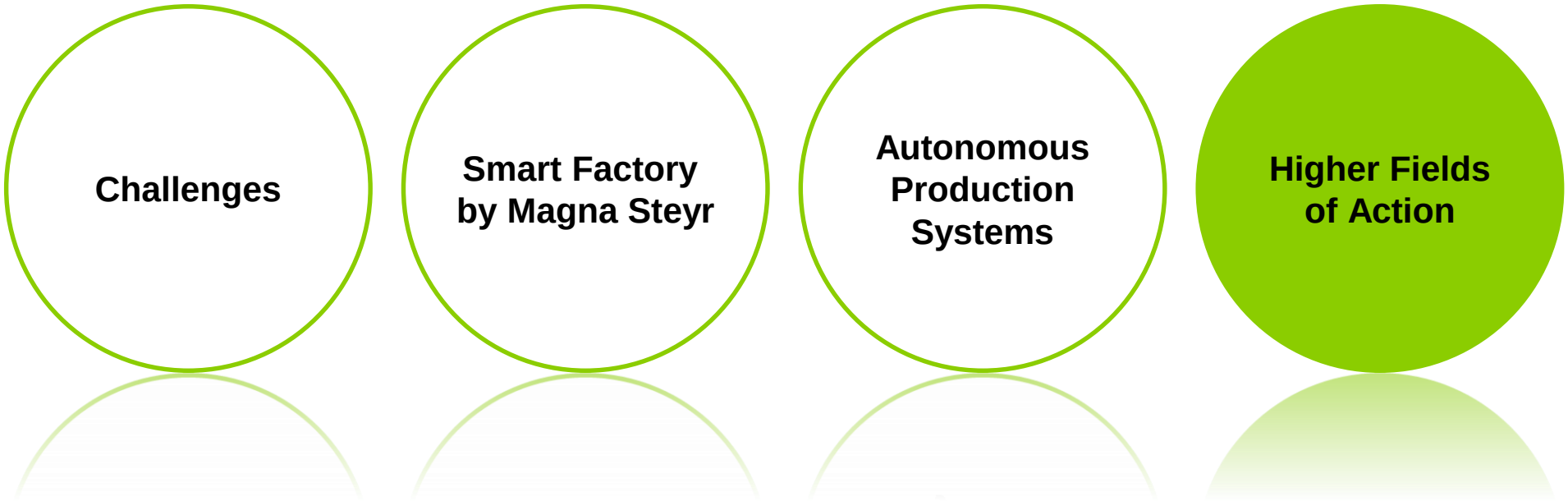
The Versatile Factory



- efficient layout
- self regulating process system
- agile cycle times
- product flexibility with multi OEMs
- order-oriented supply chain
- lowering turnover investment
- volume flexibility
- worker-friendly support devices
- increasing operating capacity

Autonomous systems are key for the Versatile Factory



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Challenges / Recommendations

- System architecture and data backbone

- Have a vison with a holistic aim but do it step-wise

Our AIV-Vision:

➢ our Material

➢ our Machines

➢ our Products

- Support evolution of standards and laws

- It's teamwork – Tech, HR, workers council, state sectors, education…

- Generate benefits for company and employees

Holistic approach requested

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…check it out on youtube

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