

Factory of the Future Drives Customer Benefits

Factory of the Future

Maturity Level of Industry 4.0



Solitary products & solutions

Unspecific use cases

Technology-centered & non customer-centric

Industry 4.0 is a system approach

Factory of the Future

Future Customer Requirements

Highest productivity

Lot size 1 at large-scale conditions

Global production networks

Highly variable factories

Massive technology change

Reduced set up times & investments

More variability & customizing

New manufacturing technologies



Factory of the Future

Contradictory Demands

High variability

Low invest

Low cost

Complete automation



Low set up time

Short product lifecycle

High productivity

Full flexibility

Factory of the Future

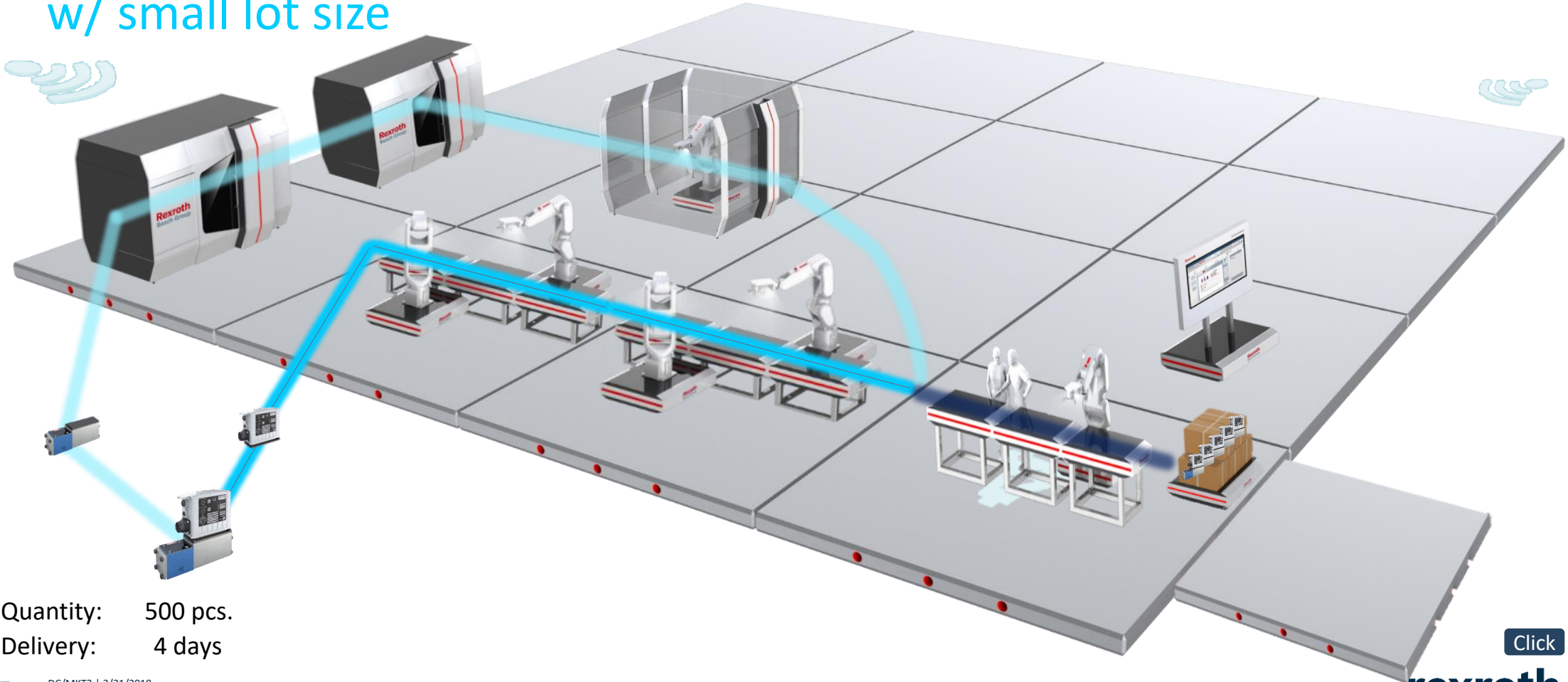
Vision of the Factory of the Future



Factory of the Future

1. Mass production w/ small lot size

1. Incoming order
2. Provision of equipment
3. Material flow & production



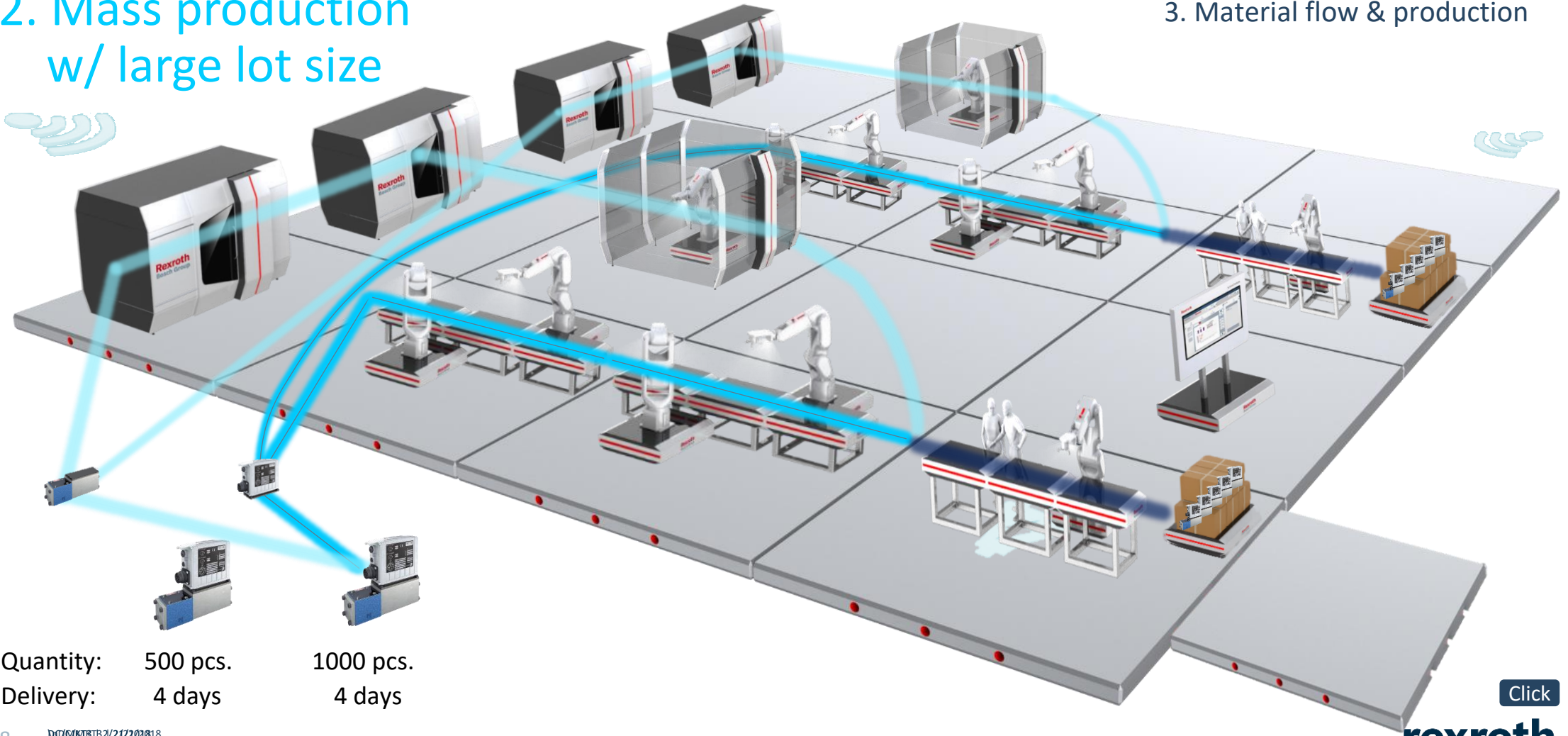
Quantity: 500 pcs.

Delivery: 4 days

Factory of the Future

2. Mass production w/ large lot size

1. Incoming order
2. Capacity expansion
3. Material flow & production



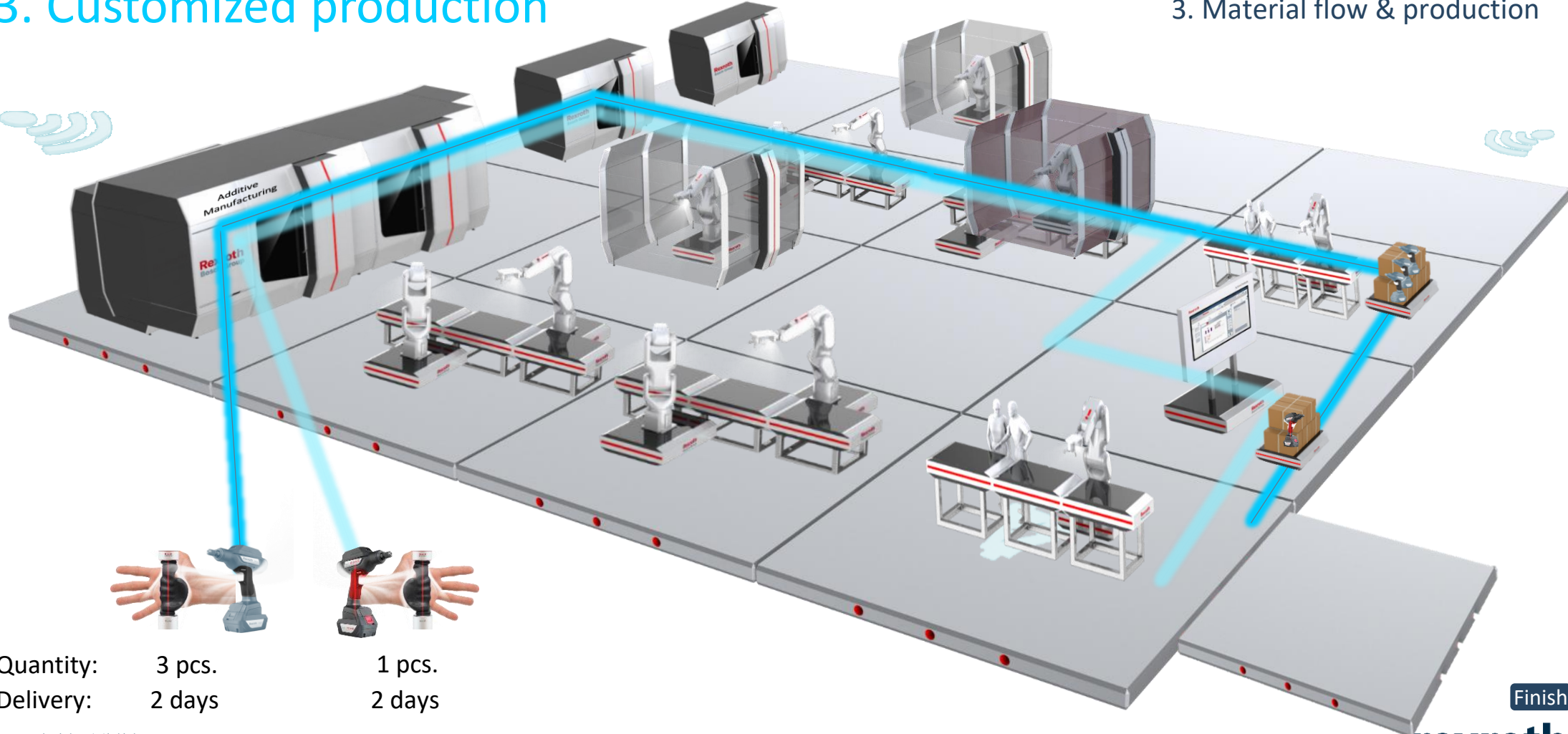
Quantity: 500 pcs.
Delivery: 4 days

Quantity: 1000 pcs.
Delivery: 4 days

Factory of the Future

3. Customized production

1. Incoming order
2. Provision of equipment
3. Material flow & production



Quantity:	3 pcs.	1 pcs.
Delivery:	2 days	2 days

Model Factory in Ulm: Vision realized first time



Factory of the Future Product Portfolio – Now.

Mechatronic

Integration capability

i4.0 ready



Factory of the Future

Bosch Rexroth technologies

Industrial Hydraulics



Mobile Hydraulics



Gearbox Technology



Moulding and Casting Technology



Electrical Drive and Control Technology



Resistor Welding Technology



Linear Motion Technology



Assembly Technology
Production Assistants



Joining Technology



Factory of the Future Product Portfolio – Next.

Robotics

Artificial intelligence

Communication standard



Example I

Smart Item Picking – model-free object recognition & path planning



Solution

Robot-based system solution for model-free automation of manual picking and placing tasks in intralogistics

Modular

Flexible construction kit with scalable technology modules consisting of robots, grippers, sensors and software

Model-free

No time-consuming teaching-in or CAD models necessary

Efficient

Pick rate > 600 picks / h, pick success 99% enables quick ROI



Areas of use:

Distribution centers and warehouses for different branches in e-commerce, like: Pharma, FMCG, wholesale, retail, spare parts, cosmetics, fashion and many more

Example II

Intelligent Floor – Infrastructure for the Factory of the Future



Energy supply

Machines and production equipment are wirelessly supplied with energy from 240 W to 3 kW

Localization

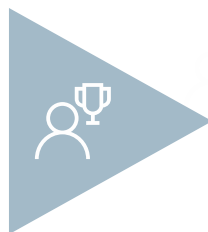
Localization of humans, production equipment and materials on the shop floor is possible

Collaboration

Applied LED visualization as a guidance and feedback system for humans and mobile robots, e.g. AGV's

Modularity

Each floor panel is 60 cm x 60 cm and can host either the standard functionality or a broad range of special functions



Areas of use:

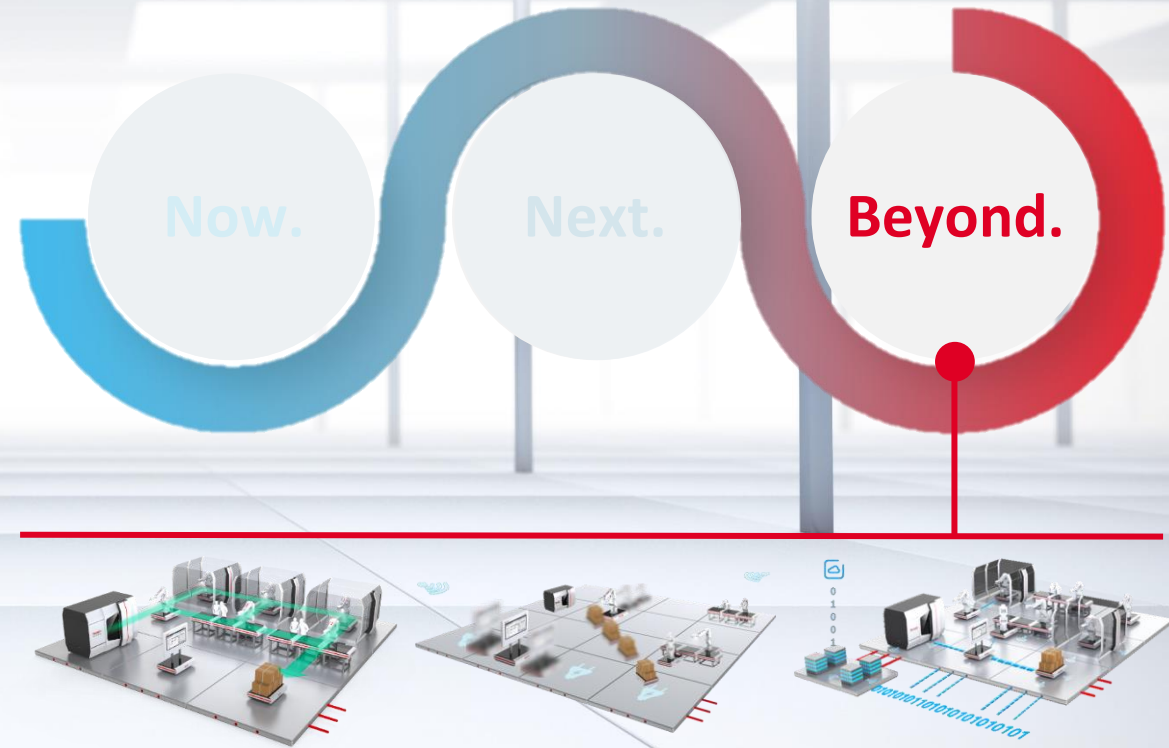
- Production lines with high demands on convertibility and flexibility
- In-house logistics areas
- Office environments

Factory of the Future Product Portfolio – Beyond.

Connected

Variable

Wireless



Factory of the Future

Use Cases – Predictive Maintenance

Optimal maintenance

Reduced downtime

Increased productivity



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Use Cases – Uptime as a service

Service

Availability

Downtime insurance



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Use Cases – Lease and buy back

Low capital expenditure

Residual value determination

Investment opportunity



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Challenges – For companies and employees

Competence shift

Customer focus

New management culture

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Challenges – Impacts on society

Digital opportunities

Dominant players

Industry 4.0 more customer-centric

Digital potential beyond

**Factory of the Future is
the answer**

