



Volkswagen
Slovakia

Smart manufacturing in Slovakia

Implementation of industry 4.0 in Volkswagen Bratislava plant

Bratislava

Data classification: public

Agenda



1. Volkswagen Slovakia

2. Digitalization Strategy

3. Activity Areas of Industry 4.0

4. Best practice manufacturing / administration

5. Summary

Volkswagen in Slovakia


Locations in Bratislava, Martin und Stupava



Volkswagen in Slovakia

Location Bratislava



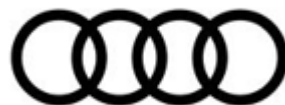
 **Volkswagen Slovakia**
Bratislava

Construction of vehicles:

- 3 segments
- SUV models since 2002
- NSF models since 2011
- Press shop with press equipment PXL91
- Additional gearboxes MQ250



Bratislava manufactures vehicles for 5 brands



ŠKODA

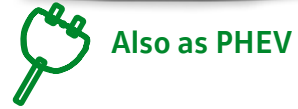


Volkswagen
Slovakia

Volkswagen Slovakia

Product portfolio: Made in Slovakia

Volkswagen
Touareg



Also as PHEV

Audi
Q7



Also as PHEV

Audi
Q8



Porsche
Cayenne



Also as PHEV

Porsche
Cayenne Coupé



Also as PHEV

Volkswagen
up!



Also as
E-vehicle

ŠKODA
Citigo E iV



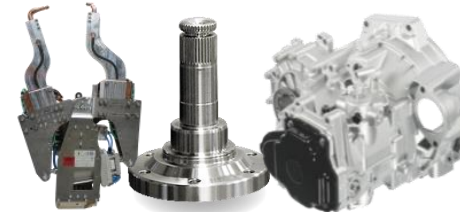
E-vehicle

SEAT
Mii electric



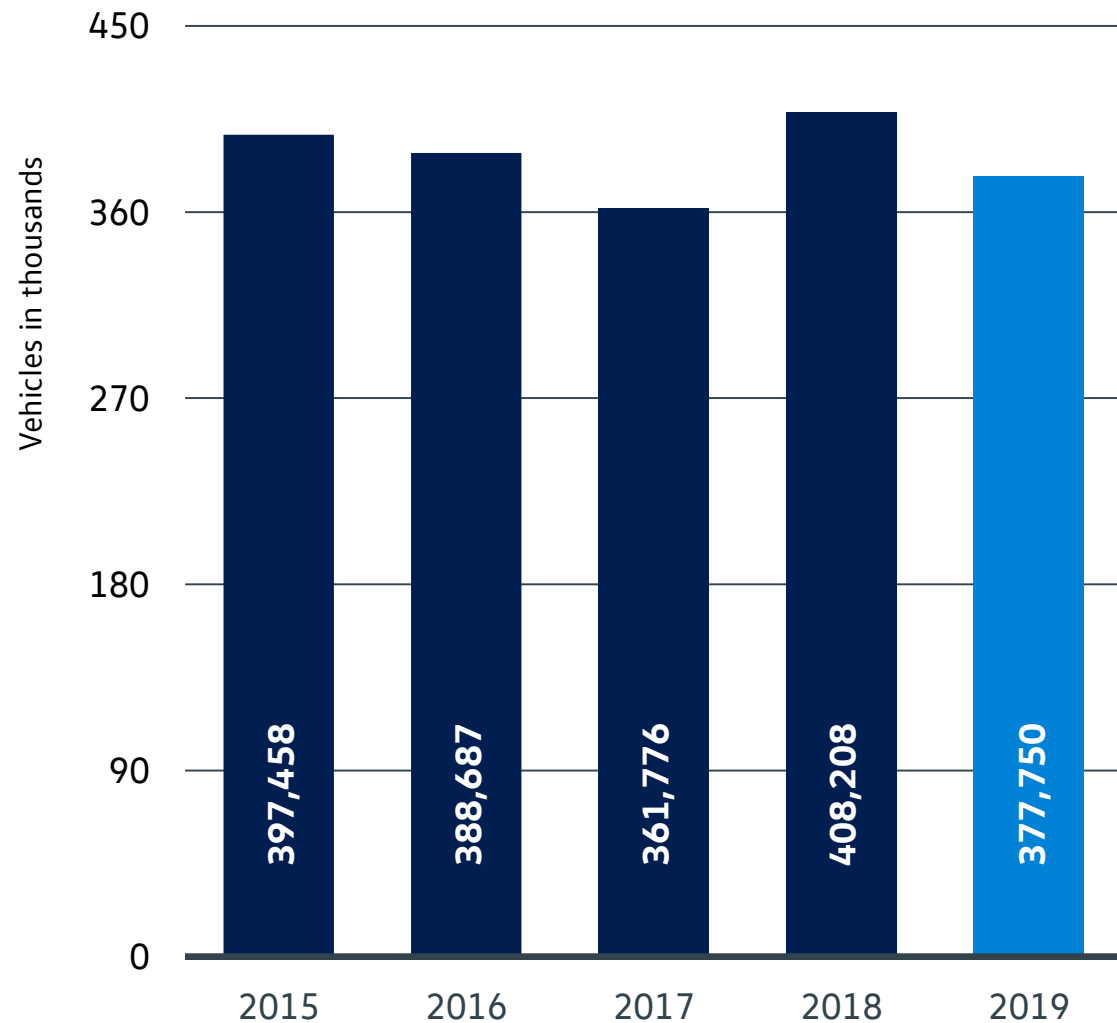
E-vehicle

Komponenten,
Werkzeuge, Getriebe



Manufactured vehicles

Volume development



Important employer

Number of employees at the end of the year 2019



12.100



We further develop the company

Our strategy NUMBER ONE




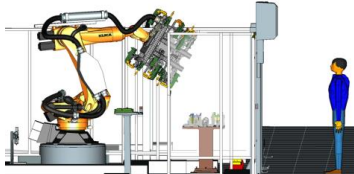
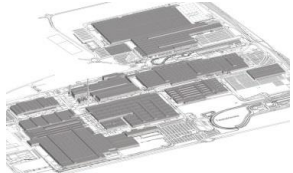
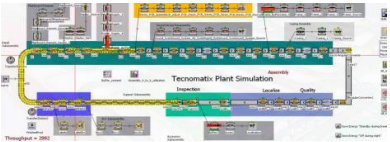
Our vision:

**Successful
implementation of future
mobility**



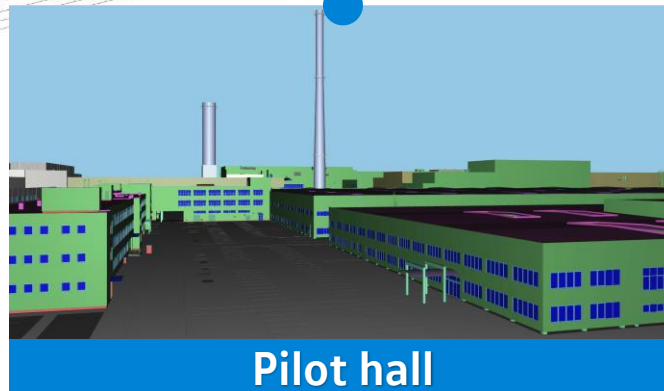
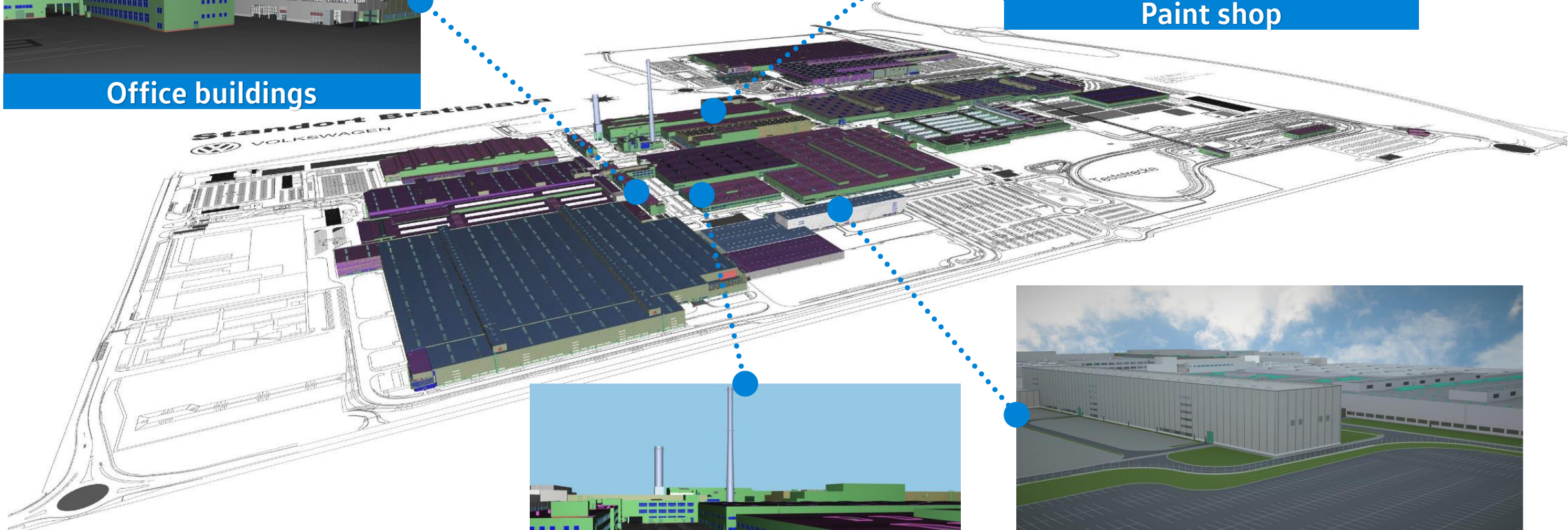
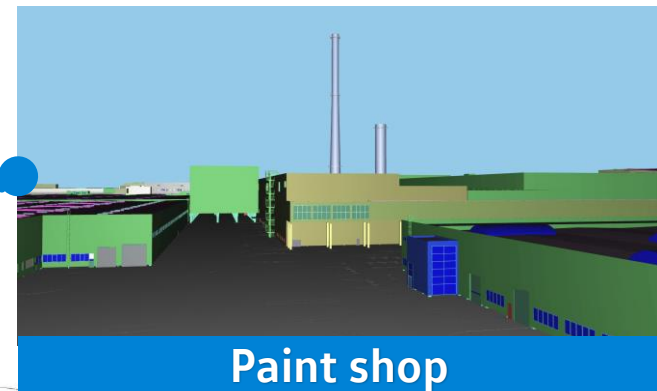
Digitalization strategy

Digital assurance – strategy roadmap

Digital scope	Key systems	Time horizon
Product 	KVS + Catia CONNECT	-
Machines and processes 	Process Designer Process Simulate	2010-2022
Plant structure 	Microstation HLS	2005-2020
Plant process 	Digital control systems/ Plant Simulation	2002-2030
Supportive processes Finance / HR / Production	SAP FI, SAP HR, K2 Sharepoint	2002-2030

Digitalization strategy

Plant structure

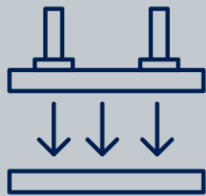


Activity areas of Industry 4.0

Focus

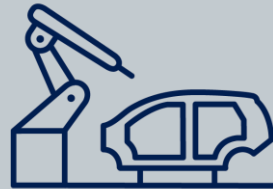
Manufacturing / planning management systems

Focus: Information technology / Smart software for managing complexity / Speed



Press shop

Focus: Process diagnostics / Automation



Body shop

Focus: Flexibility / Cost / Automation, Process control



Paint shop

Focus: Process cost / Automation, Environment



Assembly

Focus: Automation, Cost

Logistics + Maintenance

Focus: Flexibility, Automation, Cost

Focus: Reaction time



Administration Finance / HR

Focus: Transparency / Speed

Activity areas of Industry 4.0

Main tools



Localization
services

Digital planning

Cameras with
automation

3D printing

Collaborative
robots

Autonomous
transport /
delivery
systems

Autonomous
process
diagnostics

Information
platforms

Big Data
analysis

Workflows

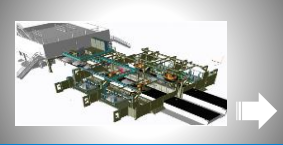

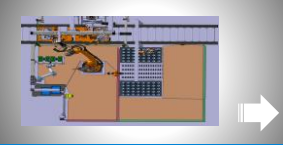


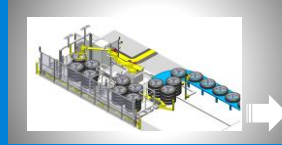
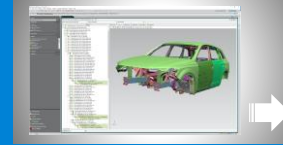
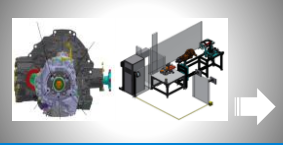
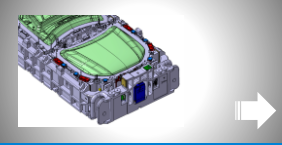








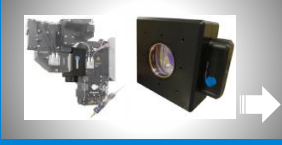










Smart
autonomous
managing
systems

Autonomous
reporting/
diagnostics

Activity areas of Industry 4.0

Best practice

Manufacturing

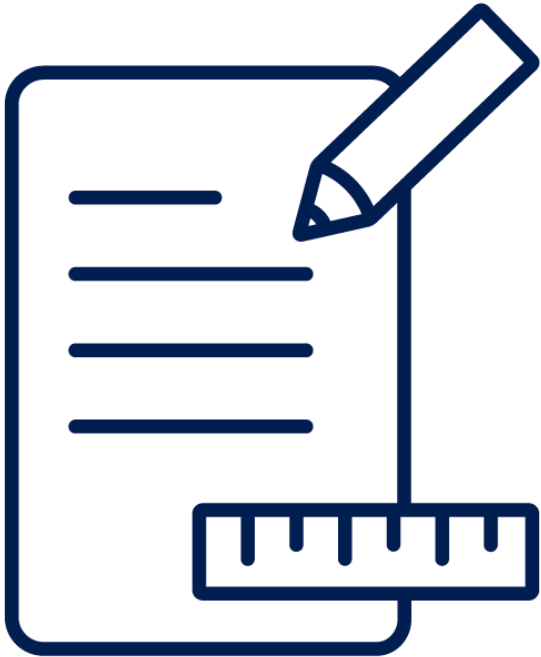
<p>Automatic stacking</p> 	<p>Collaborative Bin picking</p> 	<p>Screw Bin picking</p> 	<p>Smart paint inspection</p> 	<p>Fuel filling with CR</p> 	<p>Aut. wheel manipulation</p> 	<p>Integrated product / process planning</p> 
<p>Screwing with CR</p> 	<p>Intelligent stamping tools</p> 	<p>Rollout Bin picking Body shop</p> 	<p>Glue application with CR</p> 	<p>Aut. screwing with CR</p> 	<p>Real time area locating vehicles</p> 	<p>Aut. volume based heating regulation</p> 
<p>RTLS Logistics</p> 	<p>Inline seat check</p> 	<p>Smart laser</p> 	<p>Multispot laser</p> 	<p>3D printing of tools</p> 	<p>Augmented reality for structures</p> 	<p>Watch dog</p> 
<p>E-paper</p> 	<p>Camera guided screwing</p> 	<p>Reverse engineering</p> 	<p>Automated warehouse</p> 	<p>AGV</p> 	<p>Smart glove</p> 	<p>eVAC</p> 

Administration

<p>Virtual training logistics</p> 	<p>Virtual qualification production</p> 	<p>World-wide group online business KPI monitoring</p> 	<p>Plant operation center</p> 	<p>Maintenance App</p> 	<p>Employee App</p> 	<p>RPA</p> 
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Smart manufacturing in Volkswagen Slovakia

Summary



- ✓ Significant technology portfolio already available and adapted on the Slovak market
- ✓ Identification and implementation of reasonable use cases requires top qualified teams
- ✓ Further roll-out potential is changing rapidly with changing technology and requires intensive cooperation of key industry partners