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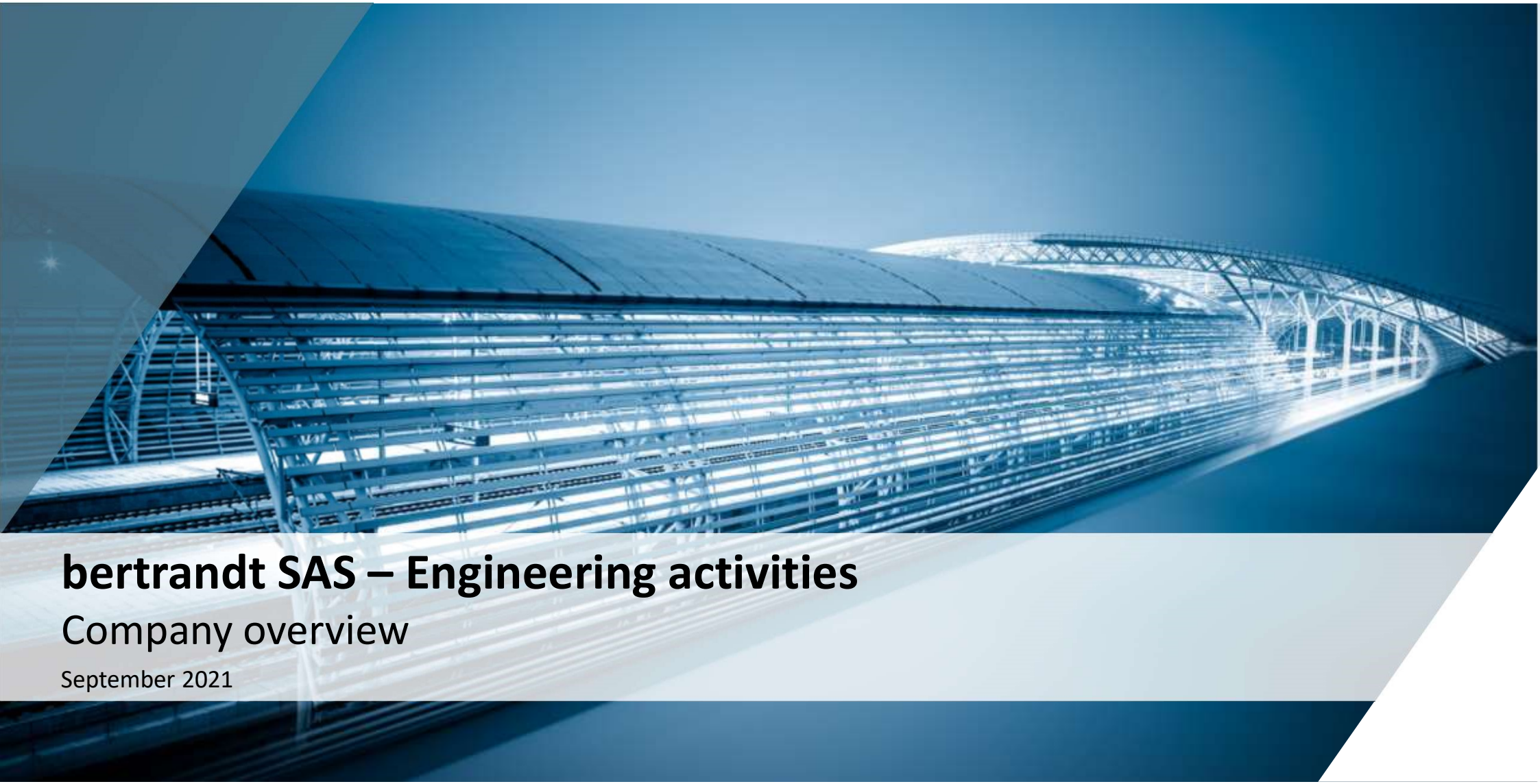

bertrandt SAS – Engineering activities

Company overview

September 2021

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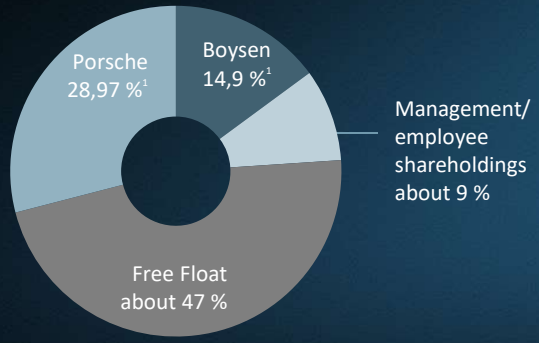
bertrandt at a glance - One or the strongest engineering supplier in Europe

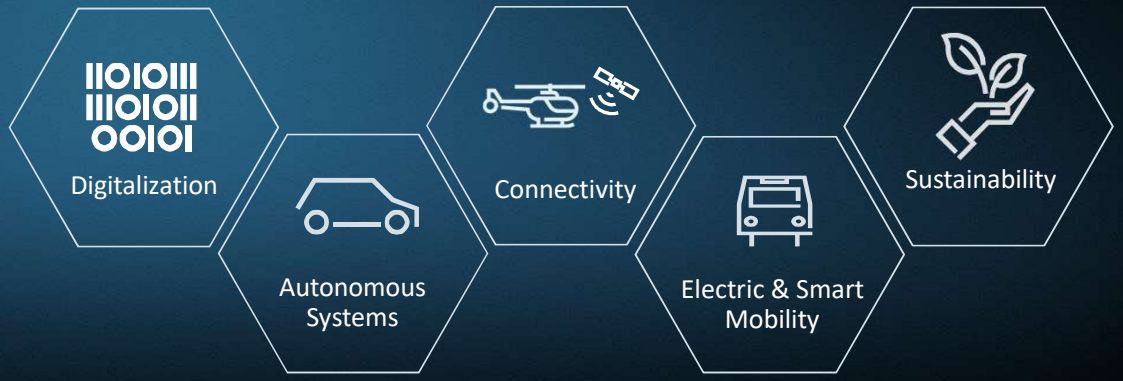
1974	~12,000	~50	>900	>40
Founded	Employees	Sites	€ m Revenue	% Equity ratio
	France : ~1,000	**France : 3**	**France : >100**	

CURRENT SHAREHOLDERS



[1]All data is based on disclosures made to the company pursuant to Section 21 et. Seq. WpHG. As of 1. June 2016

PRESENT & OUTLOOK: 5 MEGATRENDS



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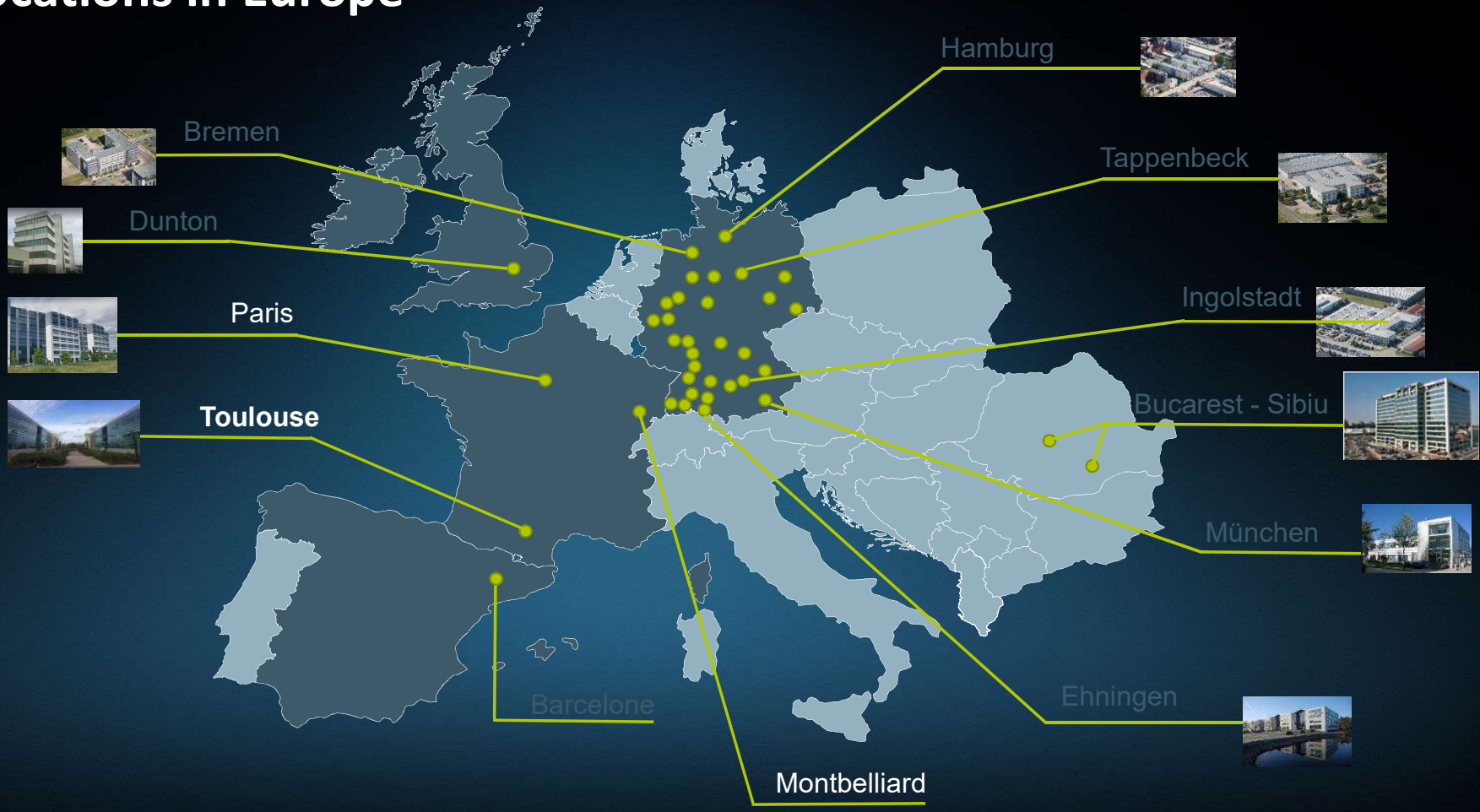
bertrandt locations in Europe



FR
1,200 FTE
3 locations

Renault/PSA
Siemens Mobility
Airbus DS
Safran

bertrandt Best cost country capacity

Capacity & flexibility in BCC

None exhaustive capacity

- Software development
- Mechanical design
- Testing
- Prototyping
- Etc…

bertrandt endorsed quality

- A key people for each project
- Ability to answer to the specific questions and needs
- Driven quality and customer satisfaction

Sibiu

Bucharest

Changchun

Shanghai

Bengaluru
(Partnership)

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bertrandt Academy

A technical and technological community in charge of knowledge capitalization

A training school capable of responding to the need for support: structure that guarantees knowledge management and dissemination of our corporate culture > A technical and technological community in charge of knowledge capitalization.

Know

Expertise

- Technical competence
- State of the art
- Job environment

Know how

Operational skills

- Steering & project
- Process
- Tools
- Missions and expected skills

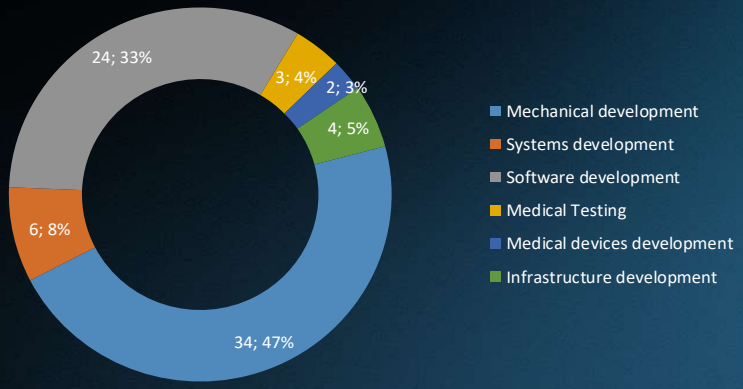
Behavior

Behavioral and inter-personal skills

- Communication and transversal animation
- Behavior and values

A multi-sector industrial know-how

Majors' partner in many industries



Automotive

Agricultural machinery

Aeronautic, defense & space

Train

Medical

Energy

Collaboration Mode

Tailor-made service - adapted to your needs

1. Turnkey / Project package

In charge of a complete study or project with a commitment to results within a contractual deadline and budget

2. Services center or « Work packages »

With a management structure that is contractually committed to the contract deliverables. Invoicing per deliverable regardless of the resources mobilized

3. Technical Assistance (TA) & Globalization

Additional know-how intended to assist in the production, application or development of a product or technique

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Quality, safety and environment

Certifications

Our management system is continually evolving and is audited annually by external certification and accreditation company

- Quality management according to ISO 9001
- Quality management in the field of aeronautics according to EN 9100
- Environmental management according to ISO 14001
- Information security according to VDA TISAX based on ISO/IEC 27001
- Accreditation of testing laboratories according to ISO/IEC 17025
- Quality management in the medical field according to ISO 13485
- Occupational health and safety according to VBG AMS based on ISO 45001

Benefits

Customer focus and flexibility

- Focus on customer satisfaction
- Ability to take responsibility
- Long-term commitment
- Financial strength

Experts

- Technology partner
- Solution provider
- Important technical means
- Internal training school

International network

- Presence in Europe, Asia, USA
- > 50 sites worldwide
- Best Cost Country capacity

Our Objectives

1. To bring effective added value
2. To become a French major development partner in long term > part of our global strategy to become a reference supplier in railway
3. Support for innovation > focus our investments in areas that are necessary but not mandatory to your core business

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Railways experiences

Worksite supervision
Commissioning

Integration of
rolling-stock
subsystems

Quality
Management

Development / validation SW
on VCU

Integration of centralized
control station equipments

Railways experiences

Extension of the Metro line A Toulouse

2016-2019
Doubling of metro trains from 26 to 52 meters

- Worksite supervision

NEOVAL Project Metro line B Rennes

2020-2021
Véhicule automatique léger (VAL), Metro on tires, fully automatic, used for urban transport

- Software development on VCU
- Test integration
- Quality

NExTEO Project, Extension of the RER line E

Communication Based Train Control (CBTC),

IT expertise

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What we do

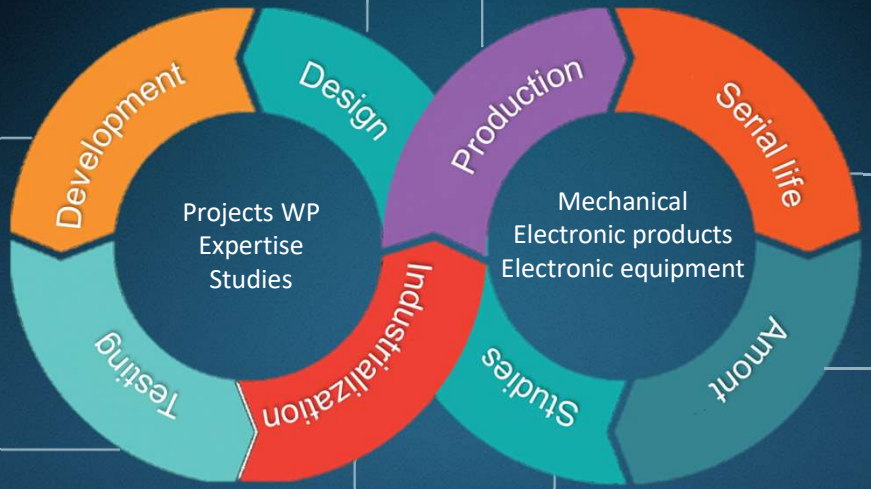
bertrandt designs and develops technological solutions for many industries

Design 3D,
2D, quotation
Hardware & SW EE
Design to cost
Safety

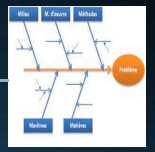
Steering
planning, costs &
quality.
Risk management

Calculations & Tests
Development Means
& Benches (HIL, SIL...)
Prototyping

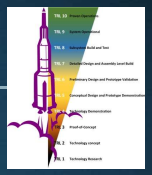
Methods, ergonomics,
robotics, logistics, line
development and start-
up



Productivity
Supply chain
Non-conformity
management
Audit



Diagnosis,
After Sales,
Incidentology
Quality plan, cost



Proof Of Concept
Innovation
Value Analysis
Virtual Reality

Concept research
Simulations
Economic optimization

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What we do - Analysis value

Through our value optimization process, we develop the best cost level VS sales optimization > the product is focused on customer expectations

Studies carried out continuously or in task force mode

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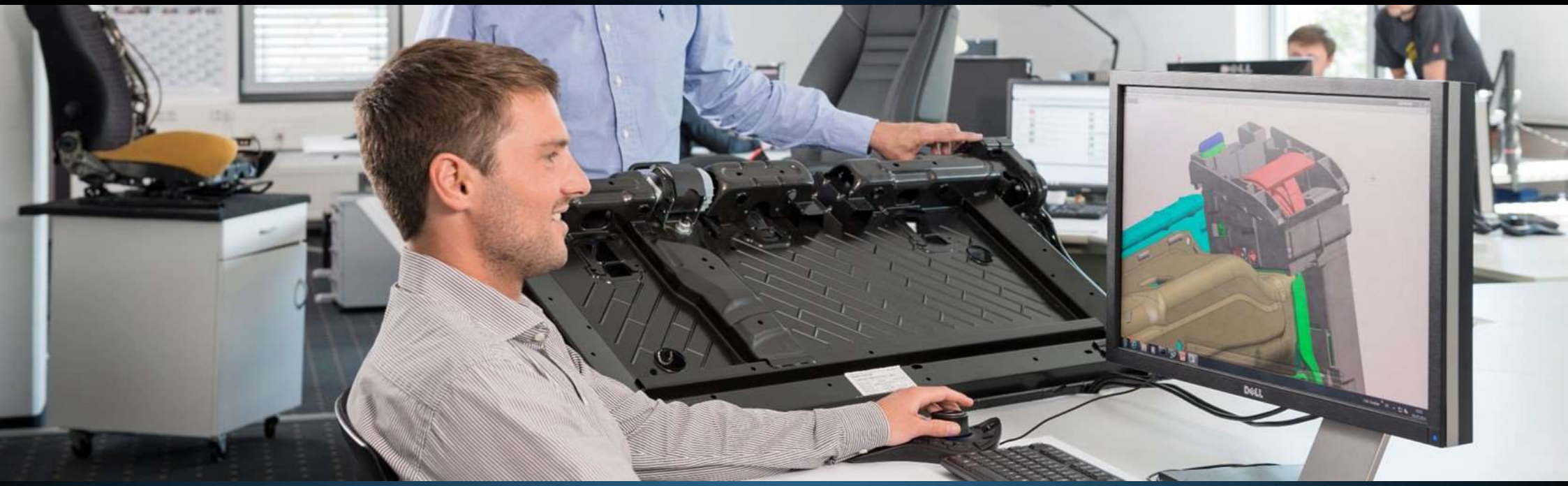
What we do – Mechanical Design



Concept

Need analysis
Concepts research
Solutions comparative
Cost Optimization
Diversity optimization

3D

Volumes design & surfaces
Parametric building
Spoils analyses
Typical sections
Architecture robustness

Simulations

Analytics, Statistics
Quadratics
Bill of materials management
Calculations - deformations, shocks, vibrations, temperatures...

2D & Chains

ISO rating
Functional dimensioning
CATIA
Standard M026, M0267, M016

Process

Plastics Processing
Tools and Movements
Shrinkage,
Thickness management
Perceived quality
...

What we do – Electrical architecture design

bertrandt is organized to cover all the band of activities to develop electrical systems from initial need to production :

- *Small-scale series*
- *Restrictions might happen for supplying some specific connectors*

1 - Pre-Architecture & Concept

2 – Modularity, Variants

3 - Electrical Studies and sizing

4 – Components Choosing

5 - 3D Integration

6 - 2D Plans & BOM

7 - RFQ Management

8 - Cost synthesis

9 – Prototyping

10 - Suppliers Management

11 - Automatic Test bench development

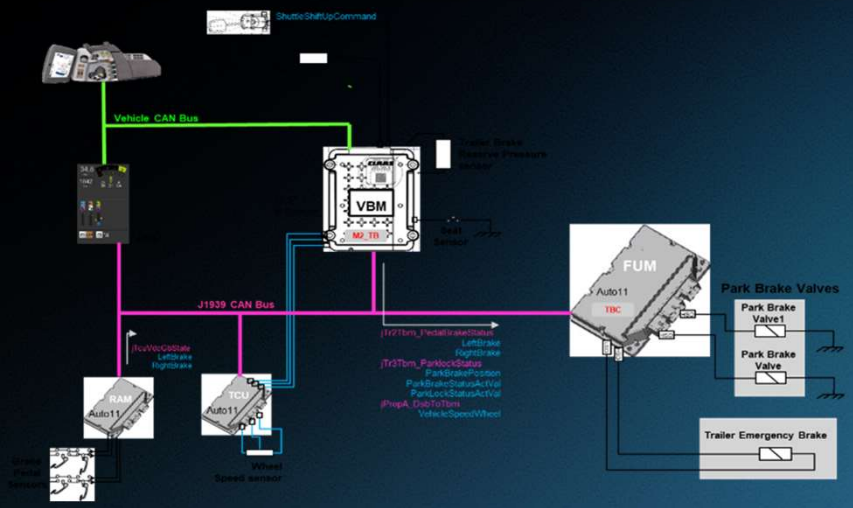
12 – Testing

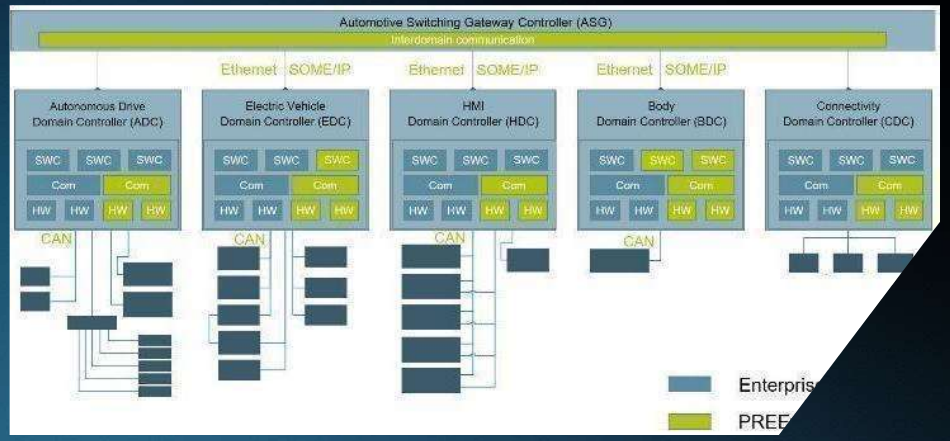
13 - Quality Analyses

15 – Benchmark

16 - Failure analysis / Flying doctors

What we do – Electronical architecture design





1 - Pre-Architecture, Concept & functional allocation

2 – Modularity, Variants

3 – Network sizing

4 – Components Specification

5 - RFQ Management

6 - Cost & risks synthesis

7 – Prototyping

8 - Suppliers Management

9 - Automatic Test bench development

10 – Testing

11 – Benchmark

12 - Failure analysis

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What we do – Software development

Cross-cutting competencies such as process and functional knowledge as well as methodological know-how and a continuous tool chain strengthen the five content pillars for convincing results.

Embedded Software

Application Software

App & Web

IT-Solutions

Data Science

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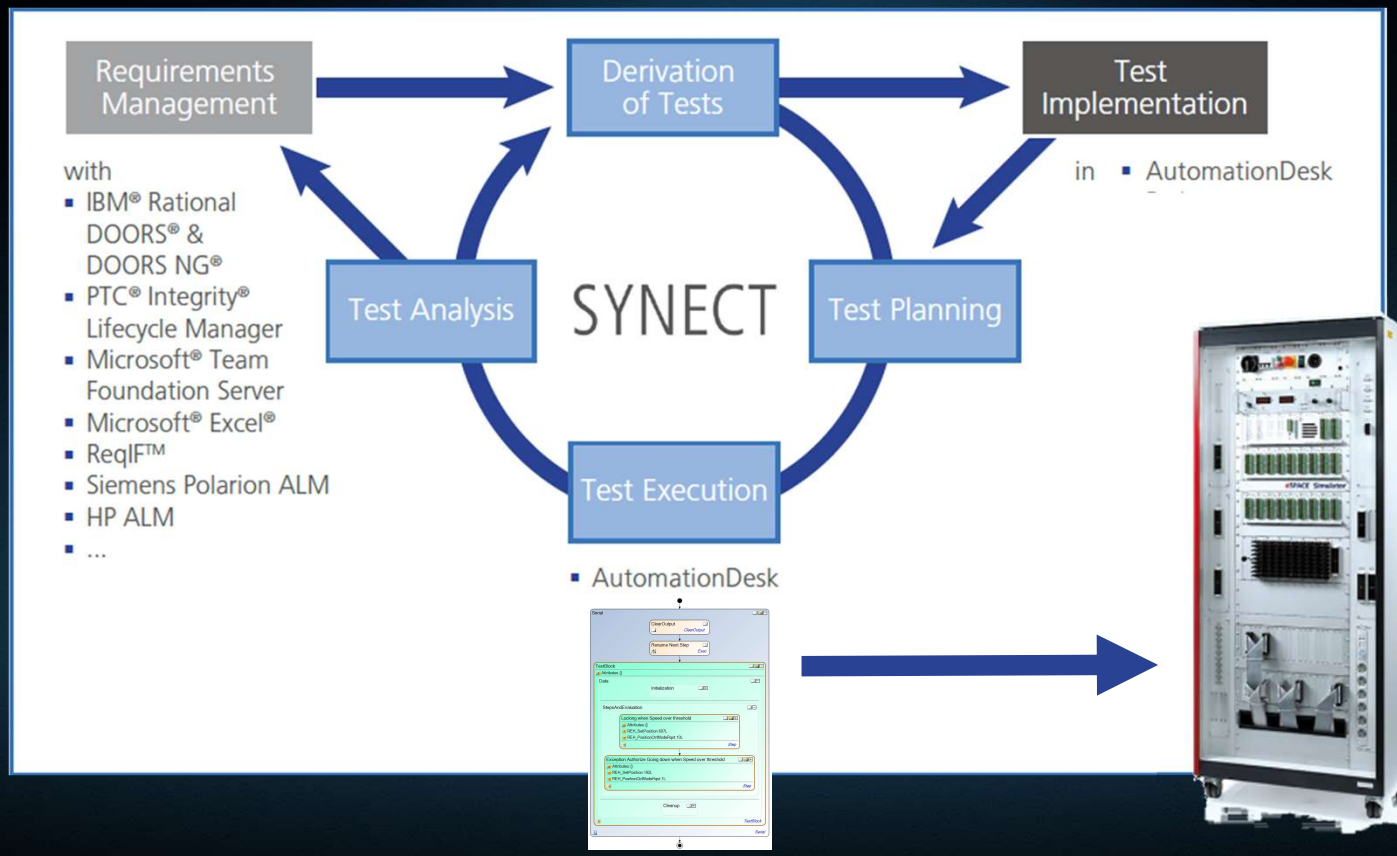
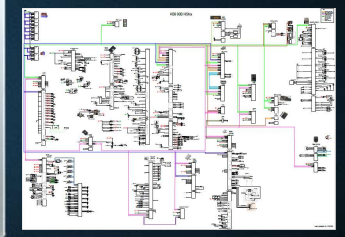
What we do – Focus Software testing

bertrandt is organized to manage testing from HIL test bench development to operational tests





HIL IOS HW Routing

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What we do – Embedded Software development

Data science: from acquisition to Intelligence

We generate knowledge from data : interaction between mathematics, computer science and our engineering competency solves your big data challenges >

Better understanding of relations:
Utilization of optimization potential in processes

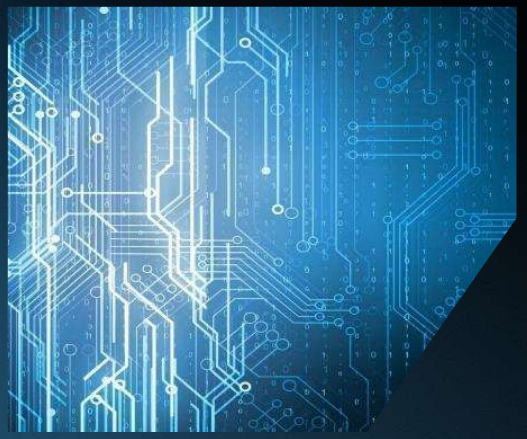
Big Data ➡ Smart Data:
Efficient administration and structuring of large amounts of data during autonomous driving

Increasing efficiency through automation:
Training of artificial intelligence by labeling the objects on numerous camera images

Predictive maintenance:
Recognition of patterns in standard system behavior and prediction of deviations

Everything at a glance:
Clear dashboards with important parameters

High-performance search for causes:
Rapid identification of reasons for failure or malfunctioning of vehicle systems



Data insight & data consulting: to identify potential and to create additional values
Data planning: to integrate our best practices into your data acquisition
Data creativity: to shape used cases of tomorrow
Data visualization: for a fast overview of your data

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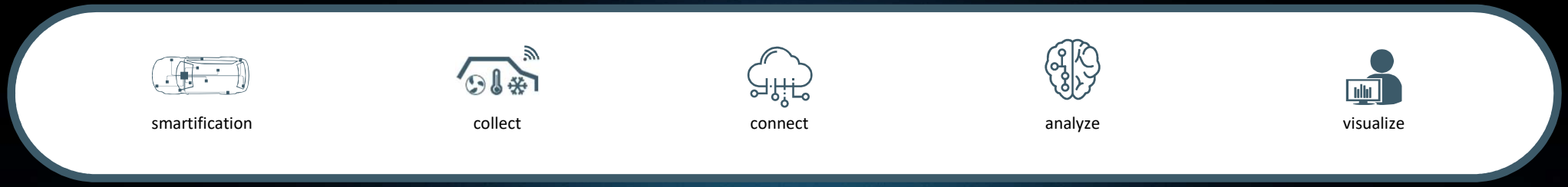
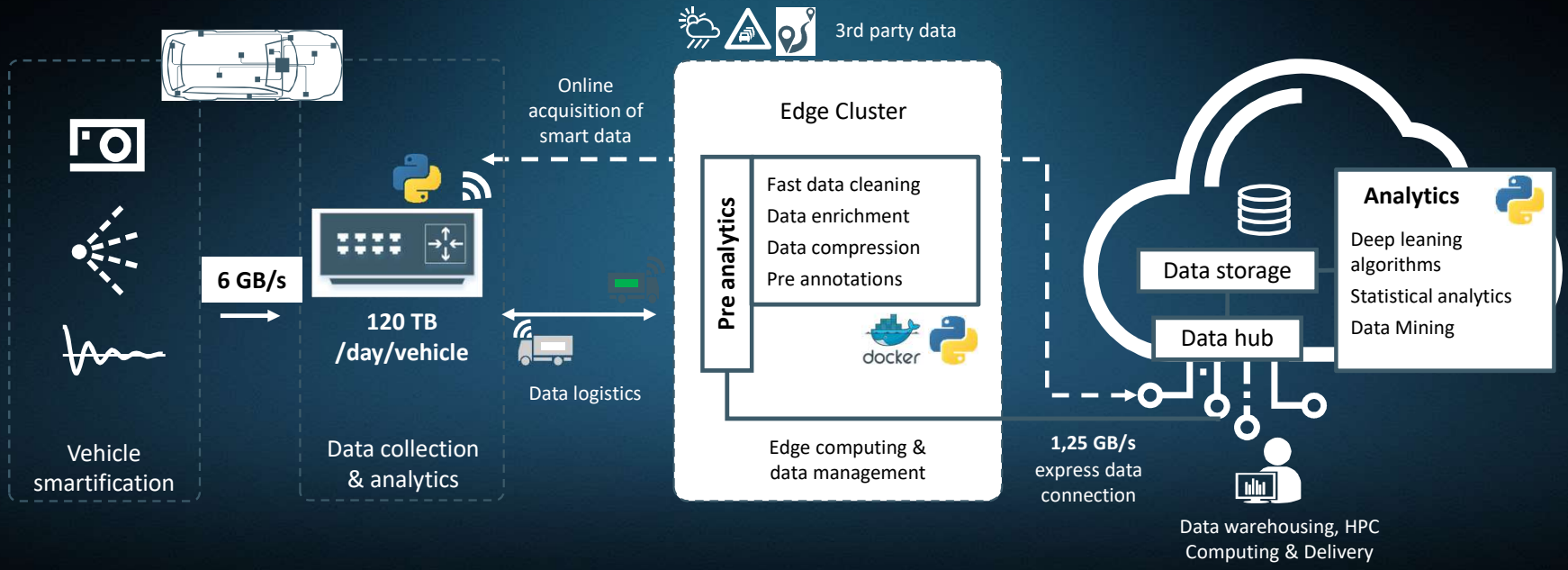
What we do – Data science: from acquisition to intelligence





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What we do – IT Solutions

We develop **customized solutions** using modern **cloud technologies** or classic on premise solutions:

- Individual software
- IaaS – Infrastructure as a Service incl. CI/CD-Pipeline
- IaC – Infrastructure as Code
- PaaS – Platform as a Service
- Data analysis and AI
- Operation, 2nd Level Support & 3rd Level Support

Individual methodology for your requirements.

- Classical procedure models
- Agile procedure models
- DevOps Methodology

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bertrandt means of testing

>100 000 m2 of Workshop

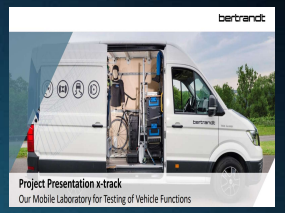
Batteries tests benches

Acoustic chambers (4)

Mechanical robot (>10)

Banc HIL (>30)

Rolling laboratory (1)



Bundle laboratory (1)

Saddlery (2)

Anechoic chamber

Shaker (>30)

Hexapod (2)

Sunshine IR (>100)

Data acquisition

EMC

Autonomous platform

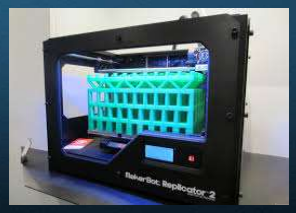
Chassis dynamometer

Climatic chamber (>180)

Pulse Hydro bench

Catapult

3D printers



Shocks (>20)

AI Drone platform

Success story

bertrandt France - turn key End 2 End development for high value / small series product

Customer:	Alpine (Group Renault)
Scope:	Design & development (Les Ulis) of: – Body and doors, underbody – Interior equipment, exterior equipment – Lighting and signaling equipment – Electronic equipment – Engine peripherals – Industrialization Planning
Responsibility:	Full firm fixed price / turnkey
Volume:	100 FTE Duration: 4 years
Tools:	Catia; OEM PLM-Software (derived from Dassault Enovia; predecessor of 3DX), Mathsub
Roles for bertrandt (nomenclature OEM):	Management of painting and sealing process; design of architecture, minimum cutouts; management of geometry convergence; digital and physical validations; project management, teambuilding management part suppliers; industrialization (Dieppe), tooling, semi automatic manufacturing; significant cost / time savings due to integrated dev. / industrialization; innovative materials and bonding (aluminum, gluing / riveting)

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Success story

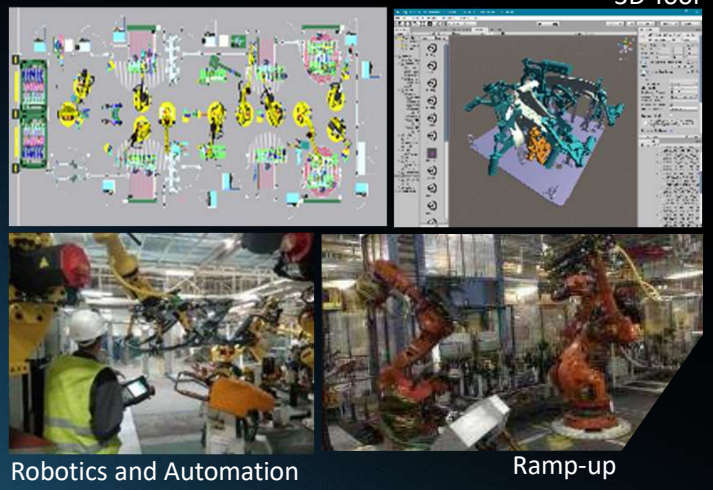
ADAS continuous development

Customer:	Automotive car manufacturer
Scope:	Series support and continuous development for Advanced Driver Assistance Systems (ADAS); Service Packs (SP) 2013, 2015, 2018: – Responsible for 87 functions – Roll-out Service Pack 2018 > 30 Versions/16 PU´s
Responsibility:	Full firm fixed price / turnkey
Volume:	Project start: 105 FTE, Project end: 60 FTE Duration: 2019 – 2022, optional extension until 2024
Tools:	FSEP; C/C++, Doors; Codify; Python, Canape; HIL-Tools; GIT / Jira; Matlab / Simulink; MBSD (Model Based Software Development); A-spice conformity; Agile development methods
Roles for bertrandt (nomenclature OEM):	Cluster manager, Test manager, function developer (elements and chains), software developer, test supervisor, coordinator standard modules, module supervisor, functional safety manager, problem manager

Success story

Industrialization

Customer:	PSA / Group Stellantis
Scope:	Bertrandt France has been working with PSA since 2010: - Support in developing integration processes for assembly lines - Expansion into full development of assembly lines - Expert partnership for engineering, manufacturing and support - Cross-functional tasks including simulation and digitization
Responsibility:	Full firm fixed price / turnkey
Volume:	Constantly above 60 FTE on an expert level since start of cooperation in 2010
Tools:	3D simulation tools; robotic programming software; Matlab / Simulink; C/C++; Doors; Link into ERP systems; learning tools; CAD/PLM
Roles for Bertrandt (nomenclature OEM):	Project supervision; construction/modeling; installation; manufacturing automation; robotics; production ramp-up while maintaining unit conformity; metrology (tracing and control); equipment installation (currently pool of 54 robots)



Success story

Experience in Hydrogen Technology

Dedicated Unit for Powertrain Solutions in Place

- ✓ > 5 years of experience for H_2 based powertrain solutions including hybrid applications
- ✓ Experts for H_2 system & component development in place
- ✓ Internal & external system & component benchmarks & feasibility studies performed

Extract of H_2 related development activities:

- ✓ **Complete vehicle "e-APE H_2" internally developed; e-propulsion system with H_2 range extender**
- ✓ Development of carbon fiber high pressure storage (700 bar), handling system & components
- ✓ Construction of carbon fiber light weight high pressure tanks and components
- ✓ Development of H_2 lab test equipment & test facility design
- ✓ Strategic cooperation established for H_2 test facilities: ET, TesTneT and TÜV Süd
- ✓ Package impact analyses, system design benchmarks and integration
- ✓ Crash simulations
- ✓ Fuel cell stack & electrolysis process development & simulations
- ✓ Application of storage system control units

Fit For Future in H_2 applications:

- ✓ Our own internal employee education program in place
- ✓ bertrandt engagement towards H_2 science aerospace clusters such as Hamburg, Bremen
- ✓ Invest in POC combining H_2 with hybrid approaches

Short video: vehicle "e-APE H_2"

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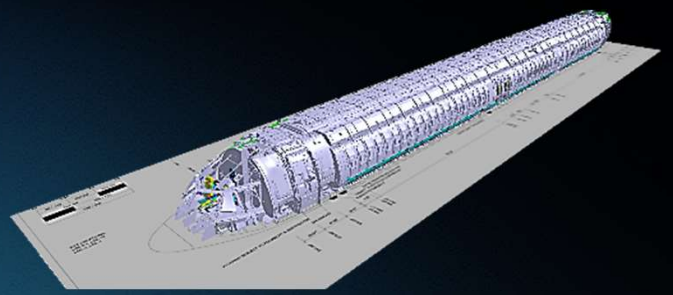
Success story

Digital transformation



1. Aerospace - Single Aisle End 2 End

- ✓ bertrandt as major realizer for eeDMU and enabler for Lean PLM / DDMS
- ✓ Early valid definition of full 3D dataset as basis for time reduction
- ✓ Realize automated customizing approaches

2. Automotive - Digital customer portal for testing and validation services

- ✓ Interactive project and time planning between bertrandt and customer via internet / cloud
- ✓ Digital-interactive inventory and test asset management, flexible and configurable
- ✓ Live monitoring of test processes, results and deadlines, AI based improvement proposals

3. bertrandt internal

- ✓ ***HARRI & SALLI***
  our own Innovation / technology platform
- ✓ Upskilling 300 FTE > 25 IPs

Learn more about HARRI

4. bertrandt internal

- ✓ ***CLIFE***
  our own Digital Twin solution for manufacturing of the future

Learn more about CLIFE

6.1. SAFe Experts (Agile)

- ✓ 10 certified Agile Coaches at group level in dedicated PM centre of competence with direct link to management board
- ✓ 250 fully trained SAFe specialists cross divisional, cross industry available → Today +200 FTE in qualification process

6.3. What CAD solutions do you use?

- ✓ bertrandt as major licence holder for all relevant CAD products → Users, experts, trainers

CATIA SIEMENS NX CAMEO SYSTEMS MODELER SOLIDWORKS creo Capital Logic

bertrandt is positioned for combining classical product engineering with top level digital experience

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Our customers

bertrandt

Understanding you better to help you better

- What are your objectives when you decide to outsource ? (cost reduction, need for expertise, lack of staff, partnership...)
- What are the main qualities you expect from your engineering suppliers ?
- Who is your main engineering supplier today ? What are the main reasons for you to change supplier ?
- What are your keys criteria for choosing your suppliers ?
- Do you have a vision of your future needs (over the coming months and years) ?

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Thank you for your attention

Contact: Jean-Paul Darlavoix – Key Account Manager

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