

FROM SYSTEM SPECIFICATION TO MASSIVE SIMULATION



Olivier SAPPIN
CATIA CEO
@olisapp



DASSAULT SYSTÈMES

The **3DEXPERIENCE** Company



- € 4.9 billion revenue
- 290'000 Enterprise Customers
- 26 million Users
- 20'000 passionate Employees
- 12'000 Partners

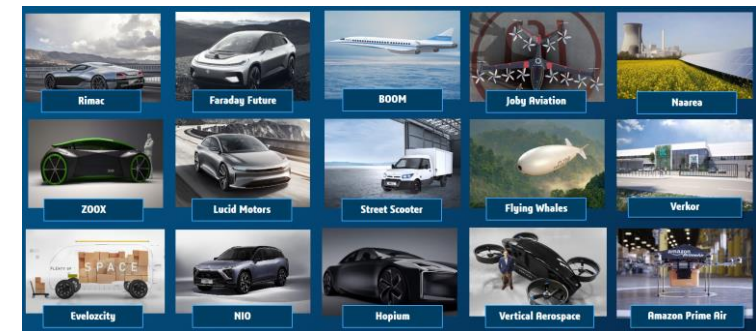
Delivering software solutions for 12 industries



Collaborating with Industry Leaders...



...& Industry Shakers



Industry Trends

Business Transformation

Deliver **New Customer Experience**



Manage **new Ecosystems & Value Network**

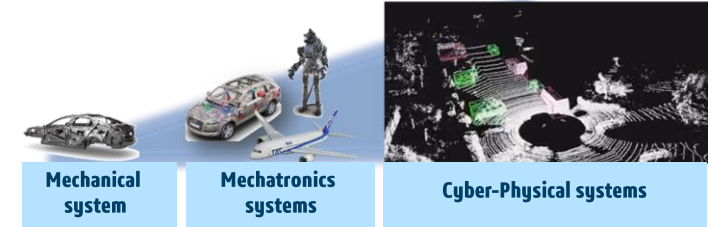


Comply with **stringent safety Standards & Regulations**



Challenges

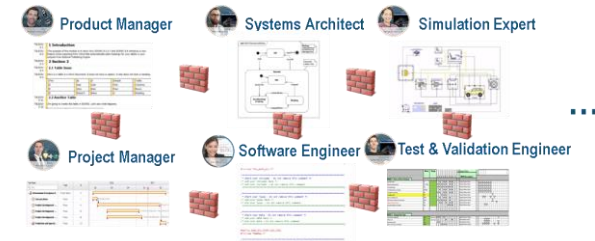
Manage increasing **interfaces & complexity**



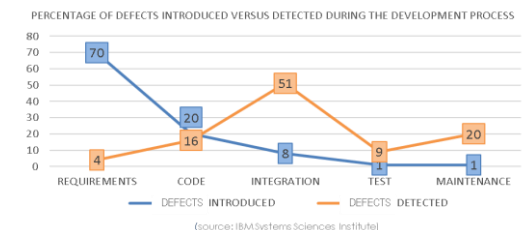
Adopt **DevOps**, with **Real world Evidence** data feedback loop



Improve **multi-disciplines collaboration** for **decision making**



Accelerate **Time to Market**, on **Quality & Cost** targets

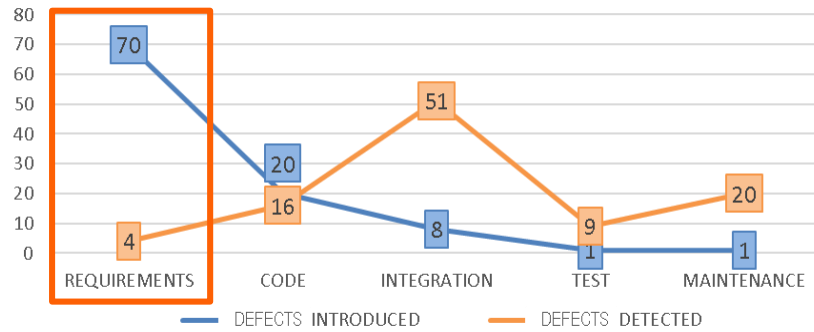


ADAS & Automated Driving Key Challenges

1

"12 conflicting requirements detected in an Emergency steering wheel function, including violated ISO26262 safety goals"

PERCENTAGE OF DEFECTS INTRODUCED VERSUS DETECTED DURING THE DEVELOPMENT PROCESS

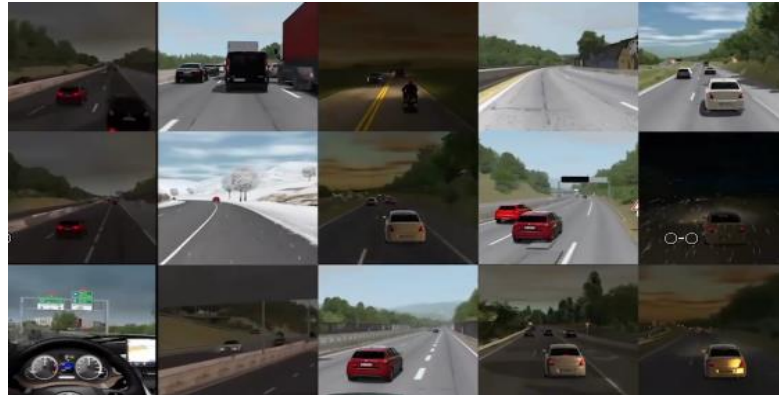


(source: IBM Systems Sciences Institute)

How to **capture specification** with the right semantics to **early detect errors and inconsistencies?**

2

"Millions of test cases with large variability are needed to cover SOTIF (Safety of the Intended Feature)"



How to define & run **driving scenarios** to **identify and validate edge cases?**

3

"Software over the air update process needs to be available to Approval Authorities for UNECE WP.29 R156"

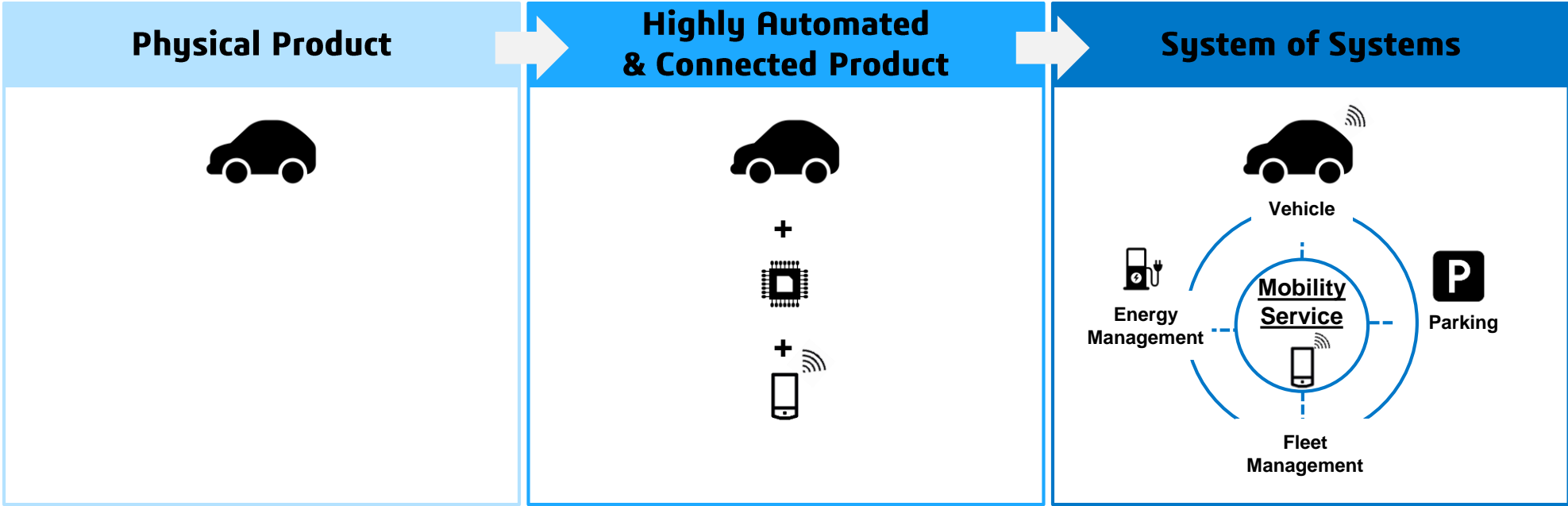


...

How to **continuously** track **engineering changes** to **comply to standards & regulations?**

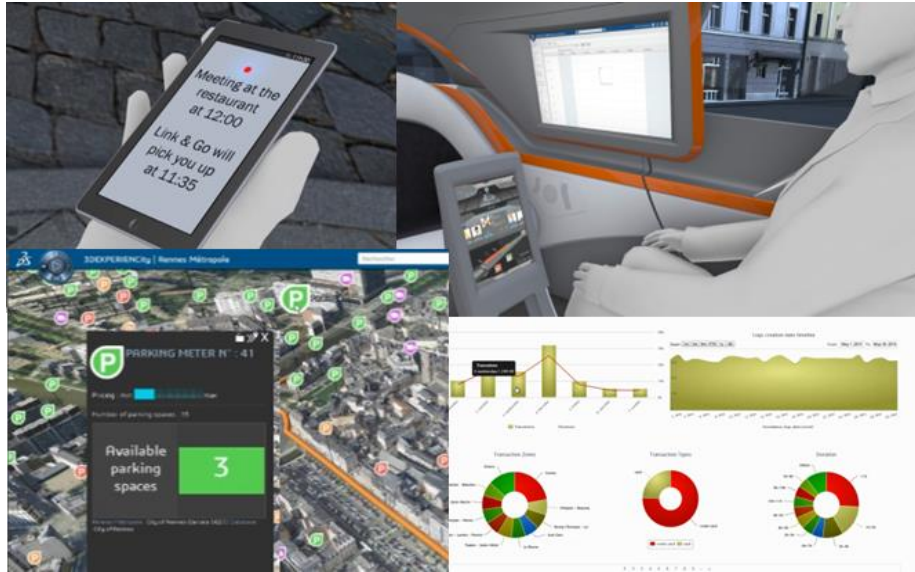
Automotive Industry Transformation

From Product to Mobility Experience



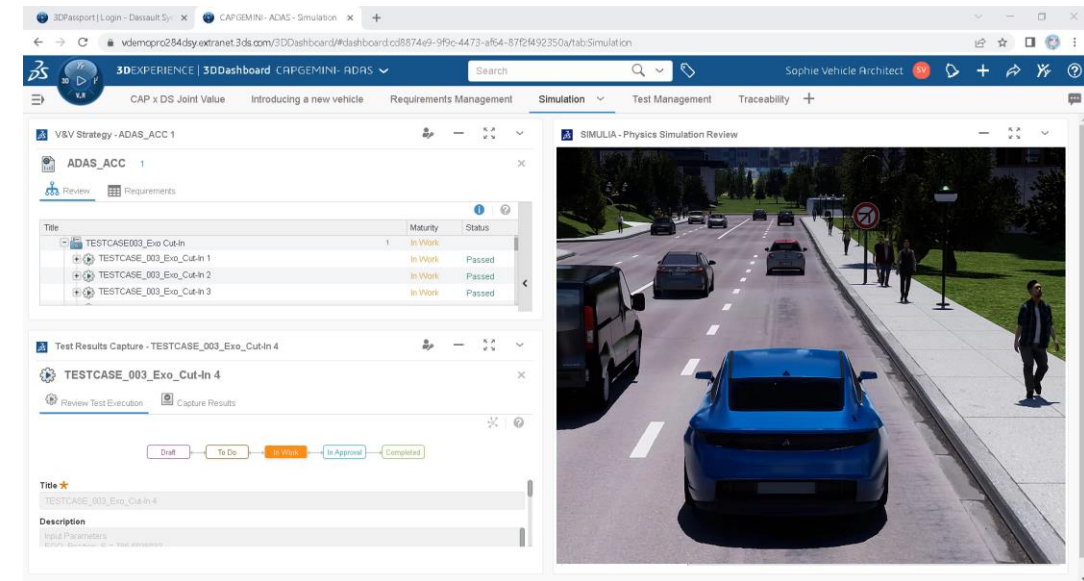
Future of Engineering

Transformation
From Product...
...to Experience

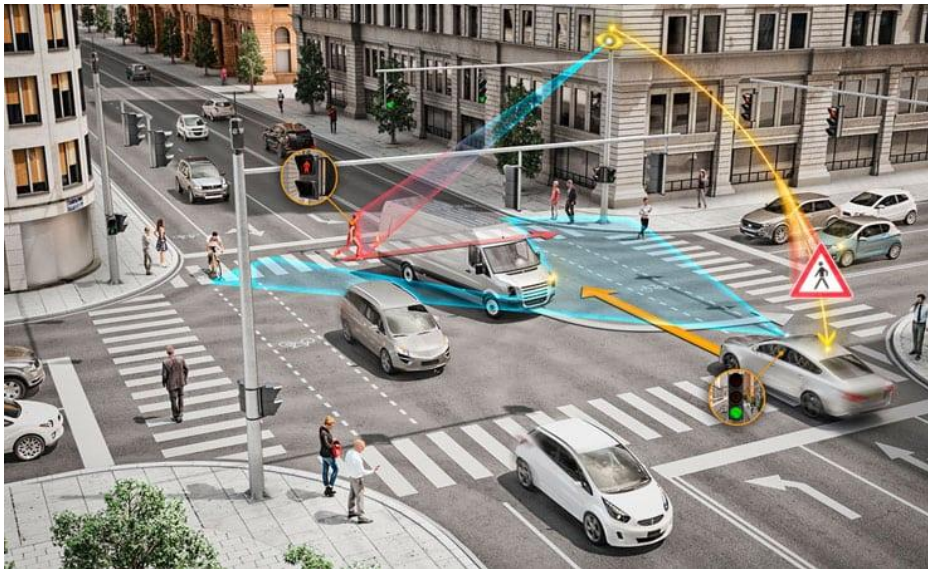


Challenge

Design, Simulate, Optimize the best system of system from Mission to Certification Driven Simulation (on time, on quality, on budget !)

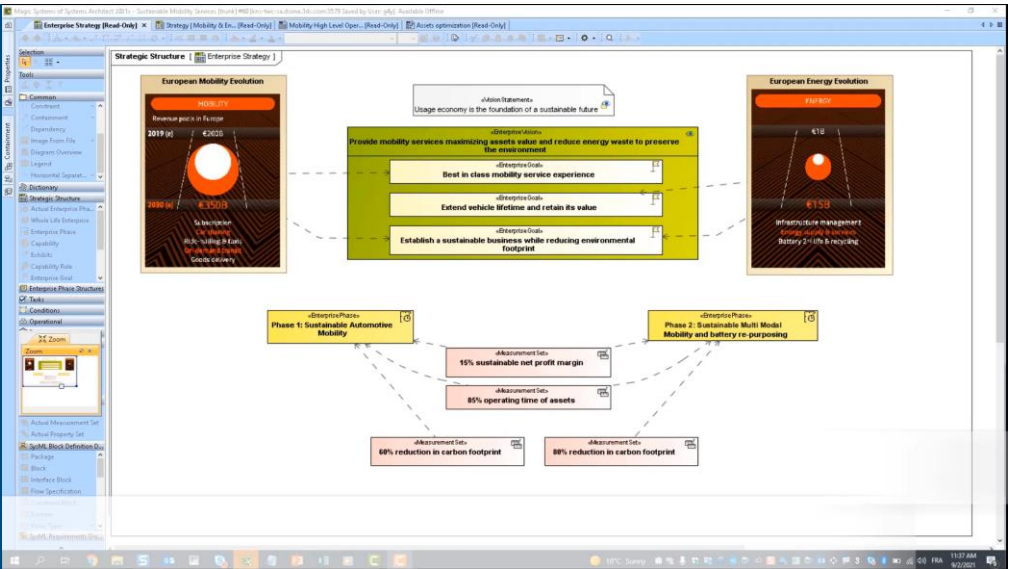


Virtual Twin for Mobility Experience



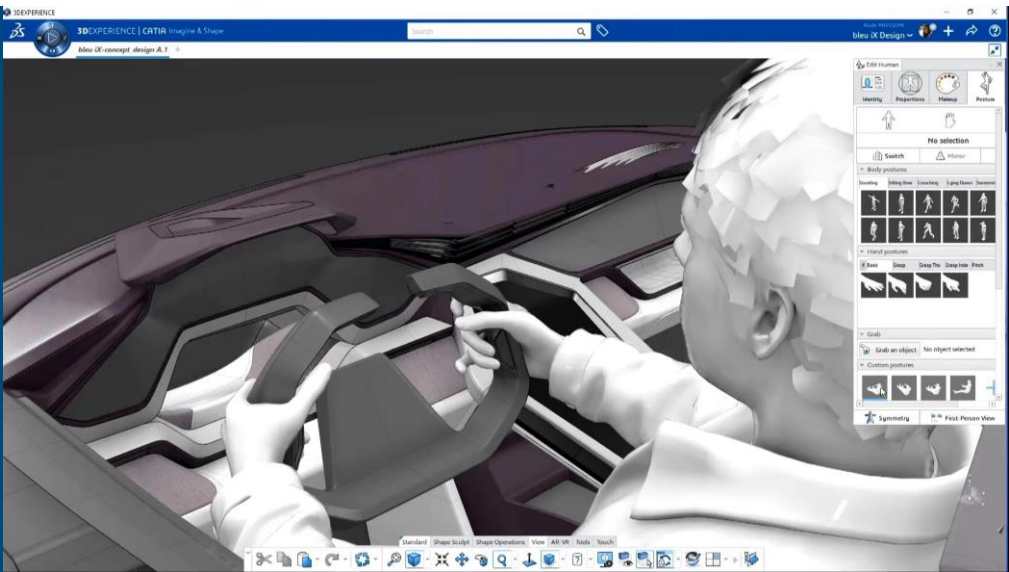
System of System Architecture

From Specification to Certification Driven Simulation



From Product Design to Experience Thinking

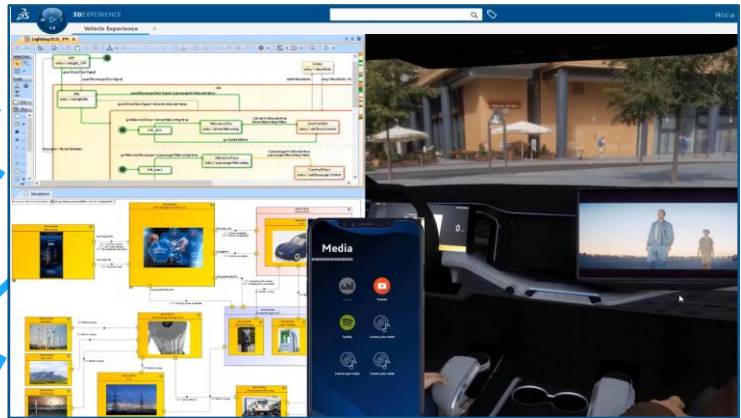
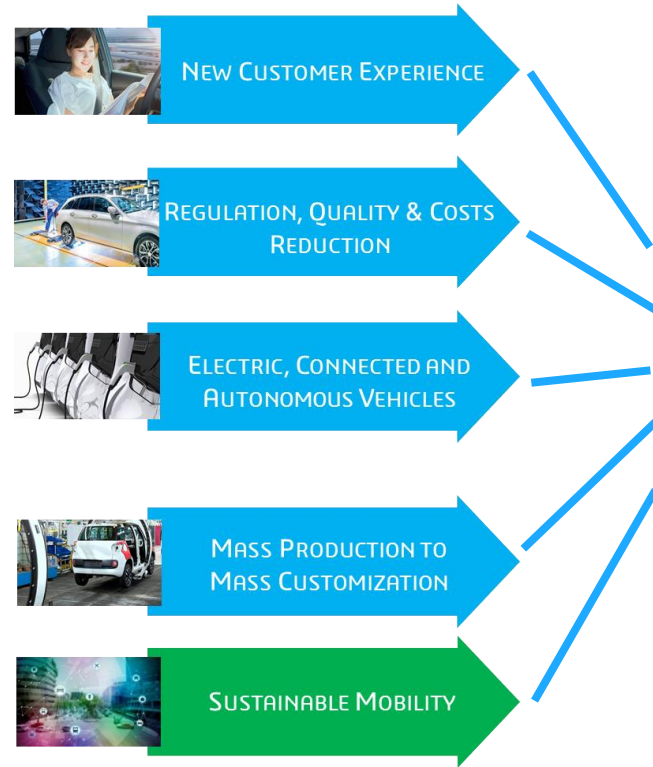
Human in the Loop



Systems Engineering enabling Virtual Twin Experience



Transportation & Mobility Business Drivers & KPIs



Communities
Smart Cities
Mobility Providers
ADAS Suppliers

Content
Regulations
Terrain
Traffic

Service
Driving Simulator
Massive Simulation

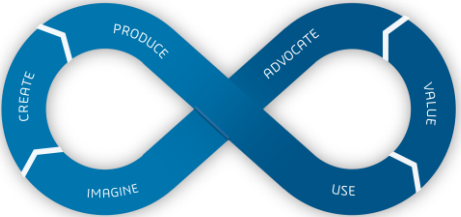
3DEXPERIENCE Virtual Twin Experiences

From Mobility Mission **System of System** Architecture
To Certification Driven **Mobility Experience** Simulation

-80% Rework loops related to issues

-20% Time to market

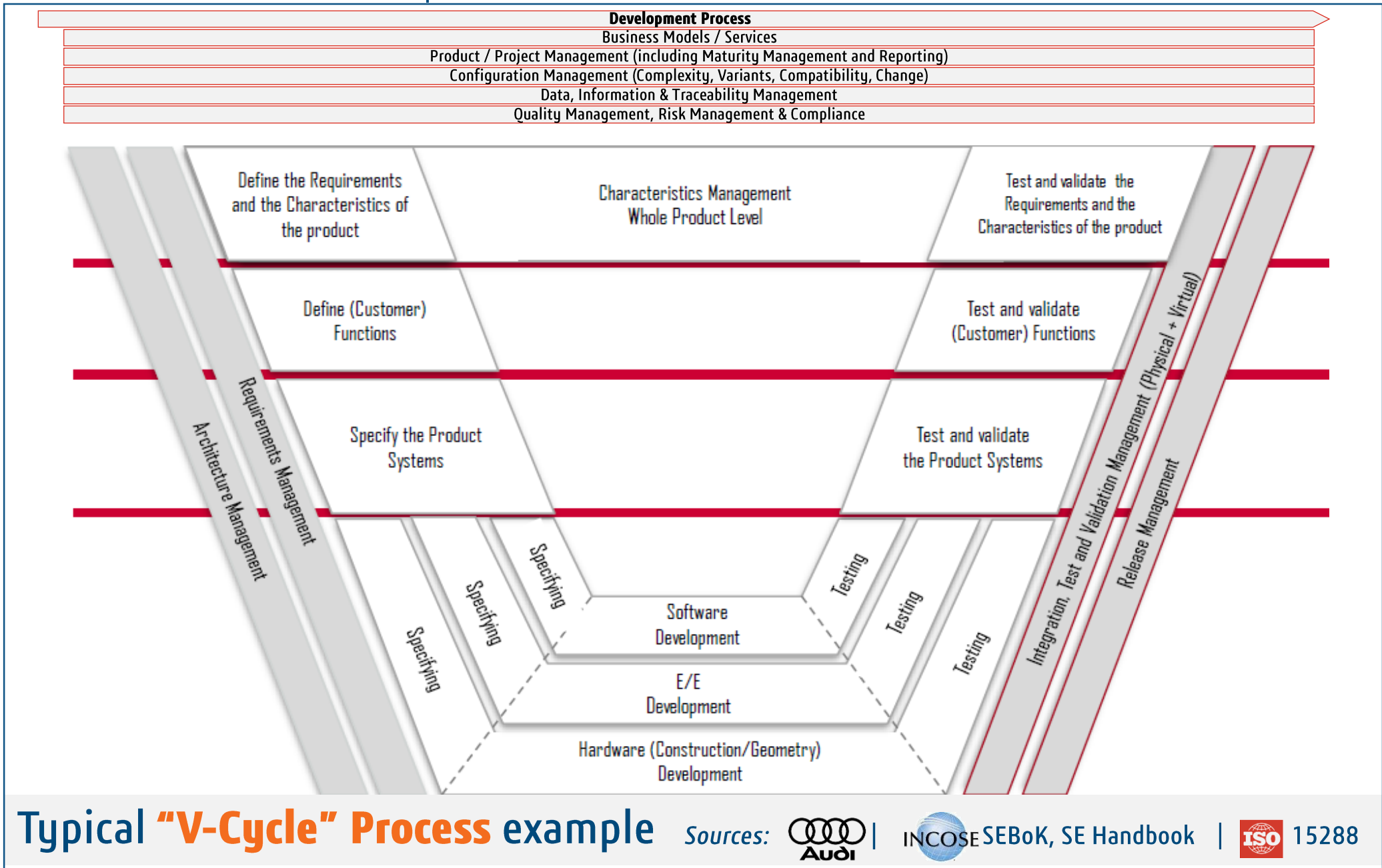
-30% Development costs



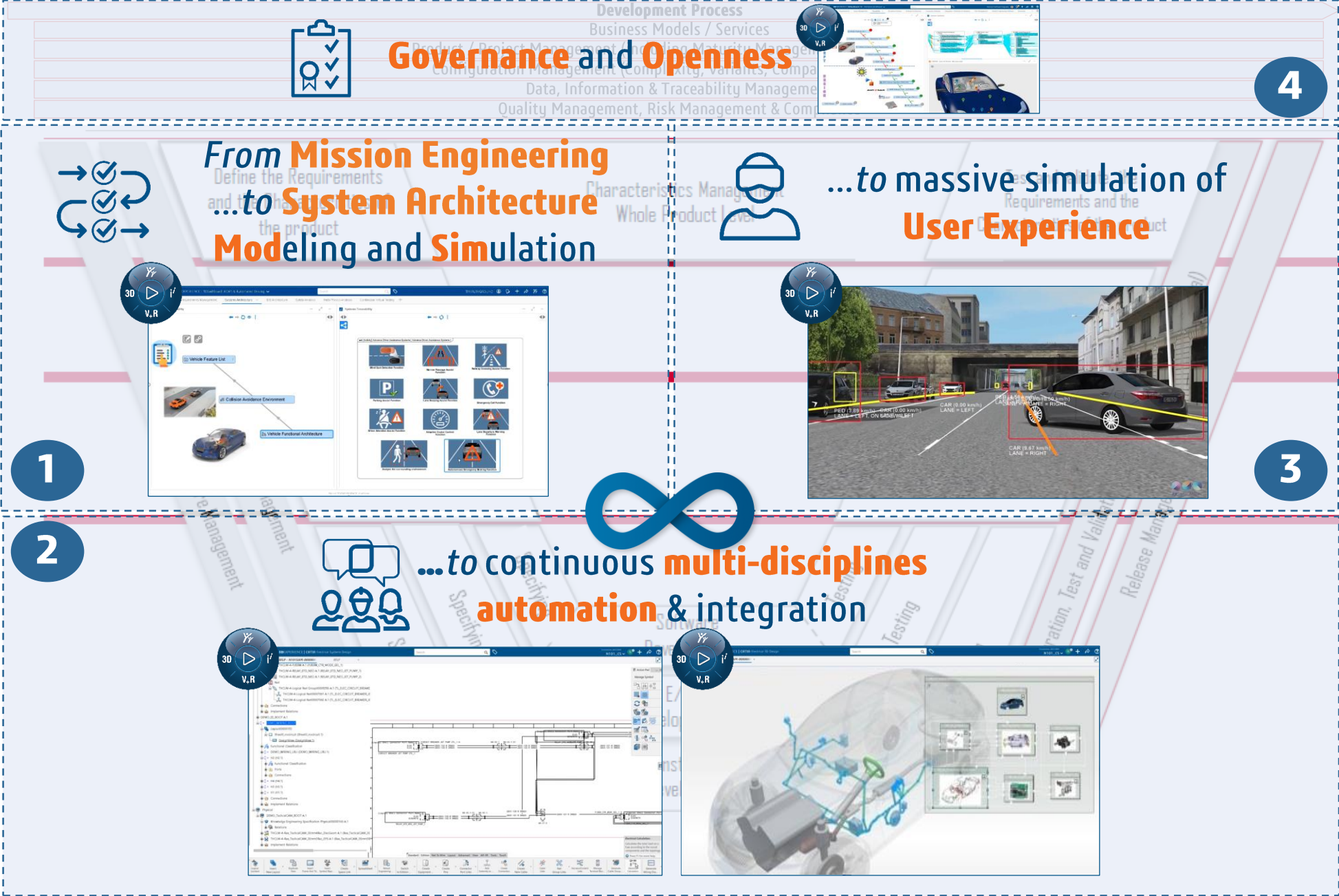
+10% Additional Revenues from Software

10y+ Experience Improvement

SYSTEMS ENGINEERING | Current State



SYSTEMS ENGINEERING | Current State and on-going Transformation



Dassault Systèmes investment for ADAS & Autonomous Driving

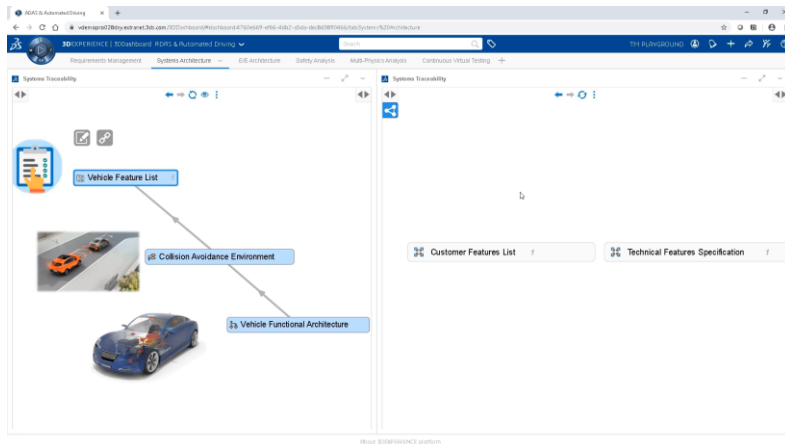
Sogclair: Equity investment of Dassault Systèmes into the capital of A.V.Simulation

Blagnac, France, January 15th 2021- 5.35pm,

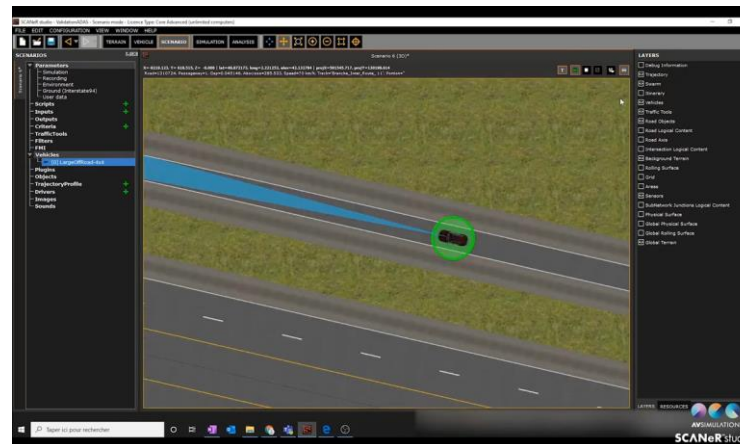


"The integration of A.V.Simulation's SCANer™ software into the Dassault Systèmes 3DEXPERIENCE Platform makes it possible to offer a complete solution for simulating the different levels of vehicle autonomy in order to **shorten their development cycles, reduce prototyping and physical testing costs and finally speed up certification**"

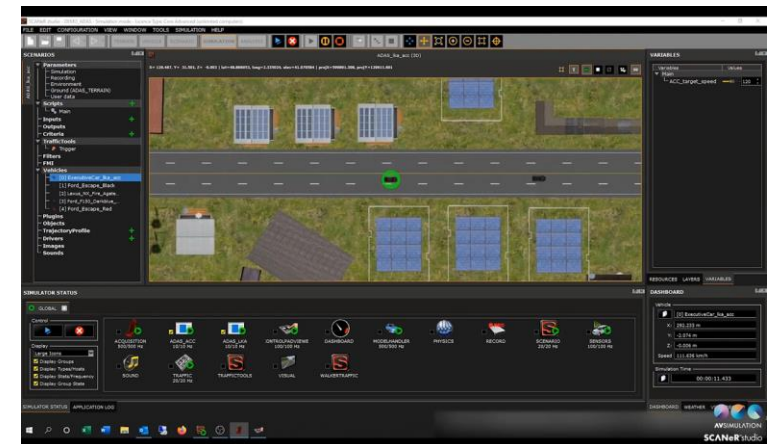
Extend the scope of Smart, Safe & Connected to **Autonomous Systems V+R Validation**



Define System Requirements & Architecture

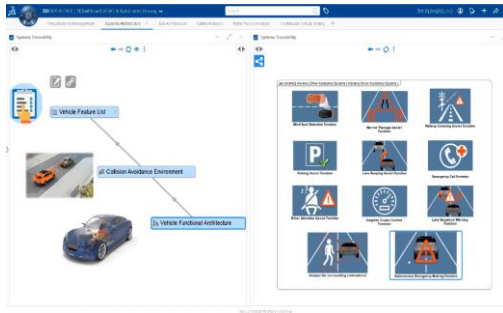


Define the Scene & Build the test plans: scenarios, traffic and V2X



Model / Software / Hardware in the loop Simulation

Strategic Partnerships to build an unique Value Proposition



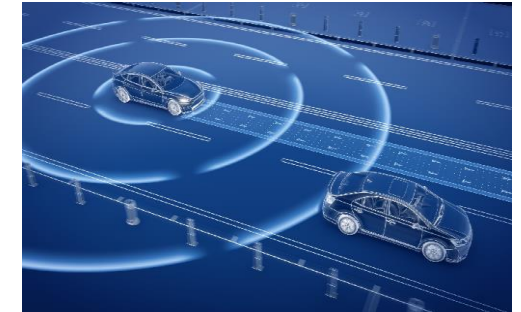
Collaborative Platform
for **Systems Engineering**
and Vehicle **3D**
Modelling & Simulation



Virtual & Real
Driving Simulator
for ADAS &
Automated Driving



Digital certification
scenarios whose realism
and accuracy are
correlated with real
on-track results



Real driving data collection
for test scenarios generation

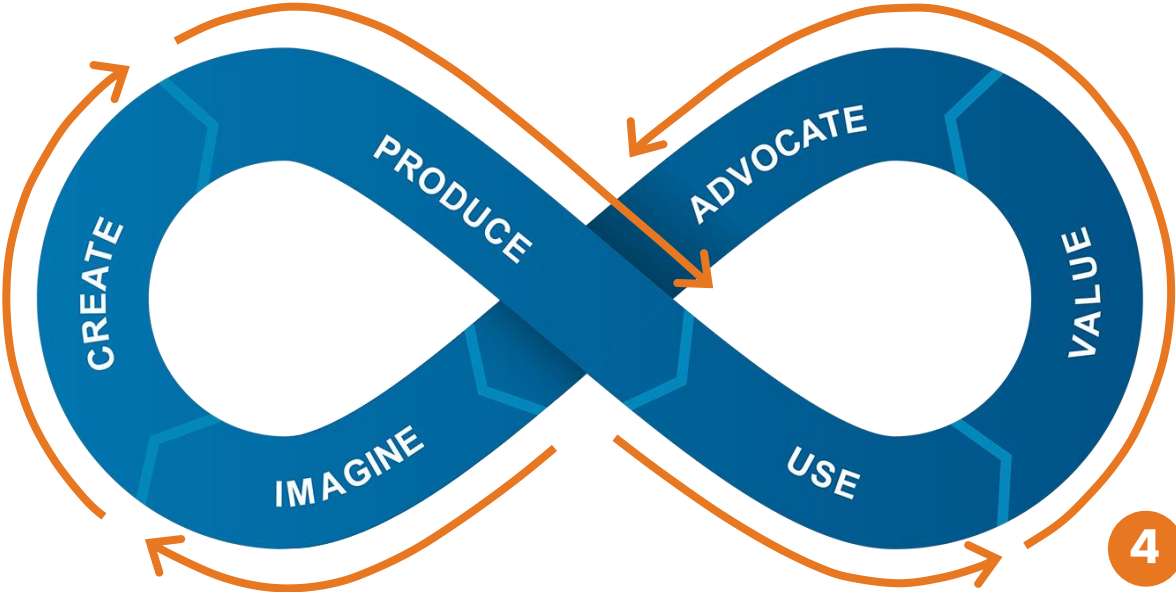
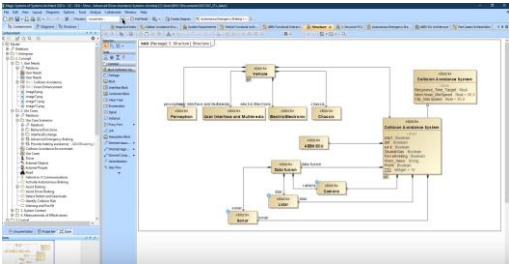
Engineering Services to
accelerate solutions
adoption & deployment

Value Proposition | Continuous Development, Integration, Validation & Delivery for ADAS & Automated Driving

3 Scenario-based Testing & Simulation (XiL)



2 Cyber Systems Modeling & Simulation



5 Real world evidence from driving data collection

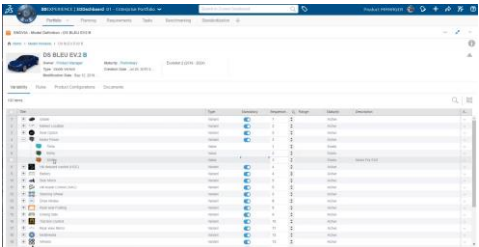


Capgemini engineering

4 Traceability & Reports for Homologation



1 Vehicle Portfolio & Program Management



CATIA COMMUNITY | LET'S CONTINUE THE CONVERSATION!

>> SCAN ME! <<



go.3ds.com/catia

A screenshot of a web browser displaying the 3DEXPERIENCE CATIA MBSE Cyber Systems community page. The page features a top navigation bar with the 3DS logo, search bar, and user profile. The main content area is divided into a left sidebar with a list of communities (including CATIA User Community, CATIA MBSE Cyber Systems, MODSIM, etc.) and a central feed of posts. The first post is titled 'MBSE Cyber Experience Symposium EMEA 2022 in Gothenburg, Oct 11-12 - Registration open!' and includes a banner image and text about the event. The second post is 'Register to SCANer Day 2022 and meet AVSimulation' by Arnaud CASTERAN. The third post is 'End-to-End MBSE' by Yves GENEVAUX. The right sidebar shows community details, members, and a timeline of recent questions and answers, such as 'Coding environment with Cameo Systems' and 'Adding External Libraries'. The footer contains links for 'About 3DEXPERIENCE platform', 'Terms of Use', 'Privacy Policy', and 'Cookies'.

