Shaping the Future: How Software, Cloud and AI Technology is Transforming the Engineering World!

Robert Lokner, Director Automotive EMEA
I can chat, respond to questions, and help you draft this presentation.

Here are some things you can try...

- Create a presentation...
- Create presentation from file...
- Summarize this presentation

Create a presentation on Generative AI in R&D

Ok, I can do that...
Critical Imperatives in Automotive

- Accelerated Vehicle Innovation
- Differentiated Customer Experience
- Resilient Operations
- Increased Organizational Productivity
- CASE Evolution
- Sustainability
- Security
- Generative AI

Emerging Mobility Services
Microsoft’s priorities in Automotive
Empower automotive companies to transform into sustainable mobility service providers

- Differentiated Customer Experience
- Accelerated Vehicle Innovation
- Resilient Operations
- Increased Organizational Productivity

- Connected Vehicle
  In-Vehicle Infotainment
  Autonomous Development
  Software Defined Vehicle
  DevOps / ML Ops
  Digital Engineering & HPC

- Connected Factories
  Integrated Supply Chain
  AI based Decision Making
  Real-time Optimized Inventory
  Control Tower Operations

- Emerging Mobility Services

- Customer Data Platform
  Digital Marketing
  Customer Journey Management
  Financial Services & Insurance
  Customer Care
  Dealer Management Systems

- Modern Workplace
  Low-code development
  Data Center Modernization
  SAP on Azure

- Data Sharing & Monetization
  Fleet Management
  Sustainability & Electrification
  Smart Mobility
  Location-Based Services
Microsoft Principles in Automotive

Your cars

Your data and intellectual property

Your brand experiences
Our Vision for Automotive R&D

Shift left half time2market

Software Defined Vehicle

Virtual Homologation

Unleash the next wave of productivity with GenAI

Integrated Toolchain

Cyber Security
Why is Generative AI taking the world by storm?
ChatGPT is estimated to have hit 100M users in January, two months after its launch. Here’s how long it took other top apps to reach that:

<table>
<thead>
<tr>
<th>App</th>
<th>Months to reach 100M global MAUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHATGPT</td>
<td>2</td>
</tr>
<tr>
<td>TIKTOK</td>
<td>9</td>
</tr>
<tr>
<td>INSTAGRAM</td>
<td>30</td>
</tr>
<tr>
<td>PINTEREST</td>
<td>41</td>
</tr>
<tr>
<td>SPOTIFY</td>
<td>55</td>
</tr>
<tr>
<td>TELEGRAM</td>
<td>61</td>
</tr>
<tr>
<td>UBER</td>
<td>70</td>
</tr>
<tr>
<td>GOOGLE TRANSLATE</td>
<td>78</td>
</tr>
</tbody>
</table>

Source: UBS
Because Generative AI is poised to unleash the next wave of productivity!
How Generative AI will transform the Mobility industry

- New customer experiences
- Productivity increases in core operations and the back office
- Acceleration of product development
- Re-skilling and change in capability profiles
In addition to the potential value generative AI can deliver in specific use cases, the technology could drive value across an entire organization by revolutionizing internal knowledge management systems.
<table>
<thead>
<tr>
<th>Generative design</th>
<th>Personalized sales co-pilot</th>
<th>Business intelligence</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Construct a lighter wheel suspension for a full electric SUV”</td>
<td>“Prepare the customer response for my unanswered eMails. Provide personalized recommendations.”</td>
<td>“Get me a report about autonomous trucks involved in harsh breaking events during the last 2 days”</td>
</tr>
<tr>
<td>Generative algorithms can reduce material cost(^{(1)}) in automotive up to 15%, weight up to 50% and engineering time up to 38%.</td>
<td>By 2025, 30% of outbound marketing messages from large organizations will be synthetically generated(^{(2)}).</td>
<td>Makes data analysis and reporting easier and faster for everyone, regardless of their technical skills or experience.</td>
</tr>
<tr>
<td>Suggest software code</td>
<td>Customer conversation bot</td>
<td>Document summarization</td>
</tr>
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<tr>
<td>“Generate code leveraging the SDV API to determine the vehicle’s fuel status”</td>
<td>“Behave like a driver’s assistant and answer customers’ questions about the new Contoso truck”</td>
<td>“Validate this Portuguese legal document and extract UNECE R.155 relevant statements”</td>
</tr>
</tbody>
</table>

**Github Copilot**

- Can foster software coding by **55%** and generate up to **46%** of code

**Conversational chatbots**

- Can help in cutting operational costs by up to **30%** and can answer up to **80%** of all standard questions

**Document summarization**

- In a customer example document review could be reduced from 11 years to a few months with **80%** approval rate.
<table>
<thead>
<tr>
<th>Synthetic scene generation</th>
<th>Public marketing content</th>
<th>AI-powered cybersecurity threat defence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>“Generate 1000 potential accident scenes to validate the recent ADAS algorithm”</strong></td>
<td><strong>“Draft an article for a newspaper celebrating our product launch in Spain!”</strong></td>
<td><strong>“Detect recent UNECE R.155 threats affecting our fleets and provide mitigation responses”</strong></td>
</tr>
<tr>
<td>Physically accurate simulation of synthetic scenes designed for up to <strong>180</strong> times(^{(1)}) faster and efficient autonomous driving testing and validation at scale.</td>
<td>By 2025, <strong>90%</strong> of quarterly report material will be synthetically generated(^{(2)}).</td>
<td>By 2025, lack of talent or human failure will be responsible for over <strong>half</strong> of significant cybersecurity incidents(^{(3)}).</td>
</tr>
</tbody>
</table>
Mercedes-Benz enhances drivers’ experience with Azure OpenAI Service

By Eric Bodard, Corporate Vice President, AI Platform

With ChatGPT, MBUX Voice Assistant “Hey Mercedes” will become even more intuitive – the U.S. beta program is expected to last three months.

Today, Mercedes-Benz announced they are integrating ChatGPT via Azure OpenAI Service to transform the in-car experience for drivers. Starting June 16, drivers in the United States can opt into a beta program that makes the MBUX Voice Assistant’s “Hey Mercedes” feature even more intuitive and conversational. Enhanced capabilities include:

- **Elevated voice command and interaction**: ChatGPT enables more dynamic conversations, allowing customers to experience a voice assistant that not only understands voice commands but also engages in interactive conversations.

- **Expanded task capability**: Whether users need information about their destination, a recipe, or answers to complex questions, the enhanced voice assistant will provide comprehensive responses, allowing drivers to keep their hands on the wheel and eyes on the road.

- **Contextual follow-up questions**: Unlike standard voice assistants that often require specific commands, ChatGPT excels at handling follow-up questions and maintaining contextual understanding. Drivers can ask complex queries or engage in multi-turn conversations, receiving detailed and relevant responses from the voice assistant.

- **Integration with third-party services**: Mercedes-Benz is exploring the ChatGPT plugin ecosystem, which would open up possibilities for integration with various third-party services. This could enable drivers to accomplish tasks like restaurant reservations, movie ticket bookings, and more, using natural speech commands, further enhancing convenience and productivity on the road.
Every app will be reinvented with AI

New apps will be built that weren’t possible before
How to increase R&D performance

Data, Software & AI driven development

Cloud, Data & AI Strategy in place

Co-pilot for R&D

“SaaSification” of Applications
Generative AI in Product Design & PLM
“Your product designers [...] **define the problem they want to solve**, using the language of design constraints, loads, materials, and manufacturing methods. The software then studies that problem, doing countless iterations, and **returns an optimum set of solutions** to the product designers...”
Example 2: Siemens & Microsoft Partnership

“... generative AI solutions could enable the factory workforce to use intuitive natural language to describe the task of a robotic system and generate optimized, reliable code to execute it.”
Democratizing GenAI Development:

Build a GenAI App in 3 Minutes!
“A customer “Vehicle Configurator Virtual Assistant” that can orchestrate customer conversations. It uses public information published on the company’s product web site.”
Our Trucks

AROCS.
Construction site transport. 18 to 41 tonnes GCW.

OUR TRUCKS.
Think PLM as a “Digital Feedback Loop”
Establish a Modern PLM Data Fabric

Note: Don’t consider the “Data and AI Fabric” as a single corporate data lake! Adopt the federated “Data Mesh”, “Data as a Product” and “Semantic Graph” pattern.
Leverage GenAI Copilots to Boost Productivity

“Which products will be impacted by the supply chain delivery shortage of the chipset B4521?"

“Construct a lighter wheel suspension for the full electric SUV KBL45”

“Generate test cases related to the new product feature"

“Suggest a new electric wiring layout for the updated model K160-v2”

Azure OpenAI Service
GPT-4, DALL-E, Codex

Data & AI Fabric

Engage customers
Optimize operations
Empower employees
Transform products
Microsoft powers leading automotive development software in the cloud | Generative AI can be added to unlock unique benefits in R&D processes

- **Derivation of requirements from text documents** through Gen AI to relieve employees from redundant tasks and increase documentation quality
- **Code interpreter** for Tier-1 supplier software to simplify comprehension of external code for R&D personnel
- **Tier-1 interaction** simplification through AI supported document screening and creation
- **Digital loop** to increase speed of software homologation process and reduce cost

**Common Data foundation** to ensure data consistency, bridge system breaks ("Systembrüche") and enable advanced analytics

**Integration of key R&D software solutions** into Microsoft Teams to **enhance collaboration**, e.g. Siemens Teamcenter, SAP in Microsoft Teams

**Selection of potential use cases | non-exhaustive**

- **Recommendations** based on existing designs, e.g. variations of components
- Support in **checking compliance of designs** against requirements and regulations during design phase
- Support in **documentation of test and integration results**, as well as **reporting** to increase efficiency and reduce errors
- Supported software development through **GitHub Co-pilot**
Thank you!