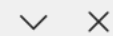**Microsoft**

JT Day
Herzogenaurach Oct 24th, 2023

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

Robert Lokner, Director Automotive EMEA

Critical Imperatives in Automotive

Accelerated Vehicle Innovation

Differentiated Customer Experience

Emerging Mobility Services

Resilient Operations

Increased Organizational Productivity

CASE Evolution

Sustainability
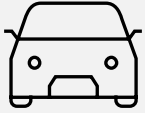
Security

Generative AI

Microsoft's priorities in Automotive

Empower automotive companies to transform into sustainable mobility service providers

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

Accelerated Vehicle Innovation

Differentiated Customer Experience

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

Emerging Mobility Services

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

Resilient Operations

Increased Organizational Productivity

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
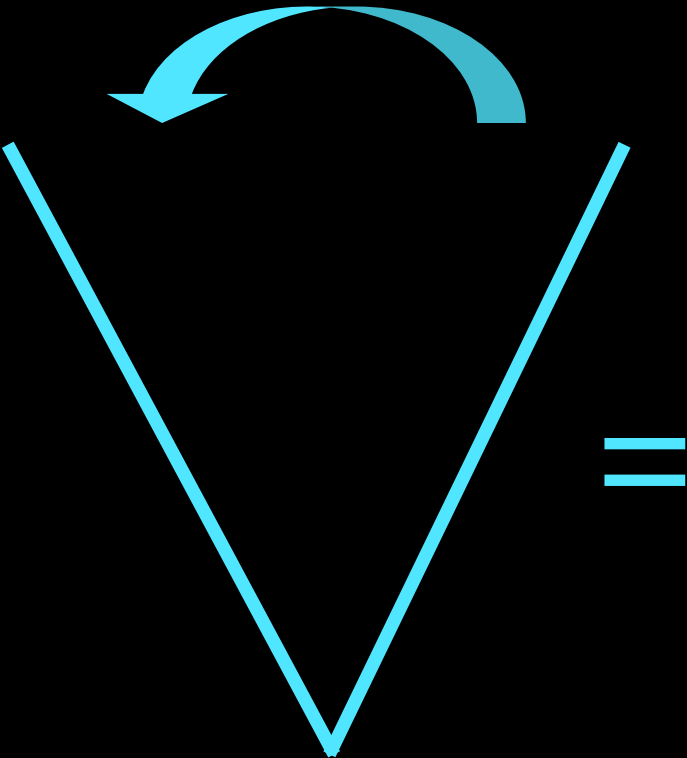
Your data and intellectual property

Your brand experiences

Our Vision for Automotive R&D

Software Defined Vehicle

SDV ™
Eclipse Software Defined Vehicle

Virtual Homologation

=

Shift left
half time2market

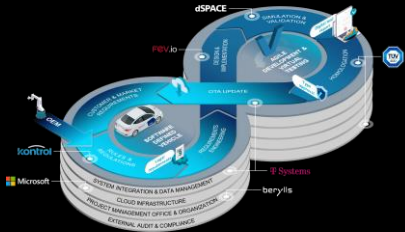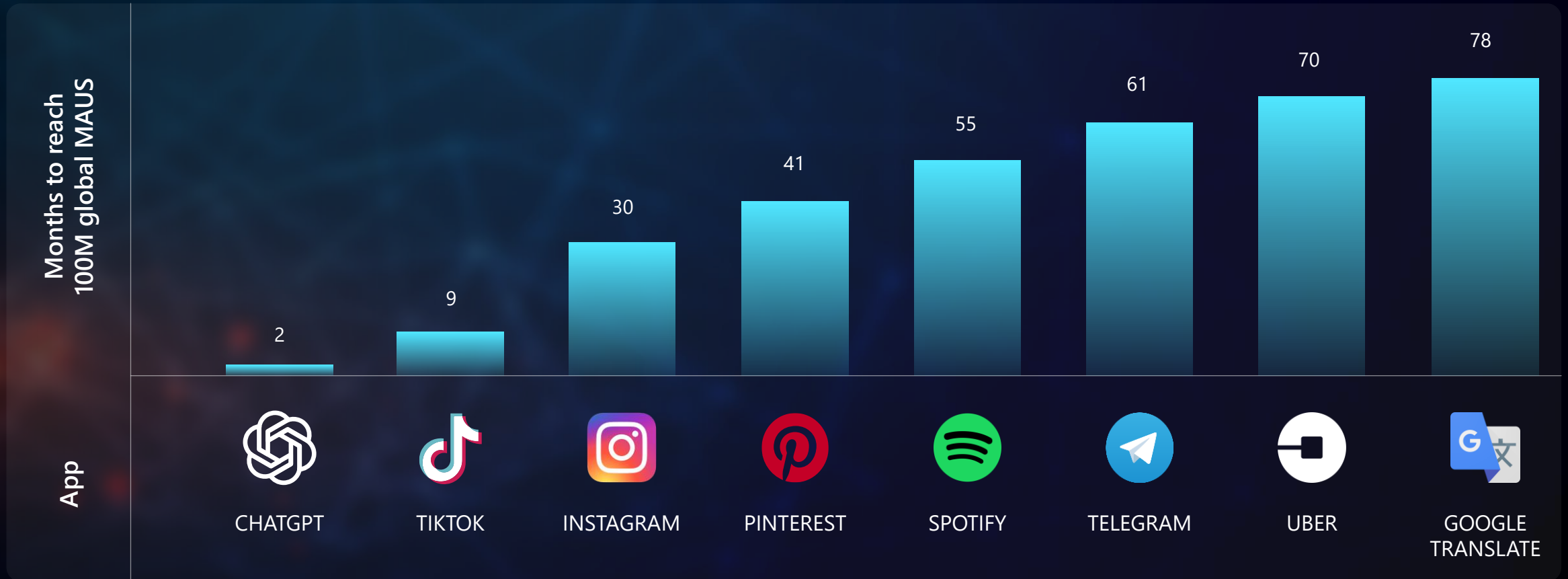**Cyber Security**

Integrated Toolchain

Unleash the next wave of
productivity with GenAI

Why is Generative AI

taking the world by storm?

How long it took top apps to hit 100M monthly users

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:

Months to reach 100M global MAUS

App	Months
CHATGPT	2
TIKTOK	9
INSTAGRAM	30
PINTEREST	41
SPOTIFY	55
TELEGRAM	61
UBER	70
GOOGLE TRANSLATE	78

App

yahoo! finance

Because Generative AI

is poised to unleash the next wave of

productivity!

How **Generative AI** will transform the Mobility industry

- New customer experiences
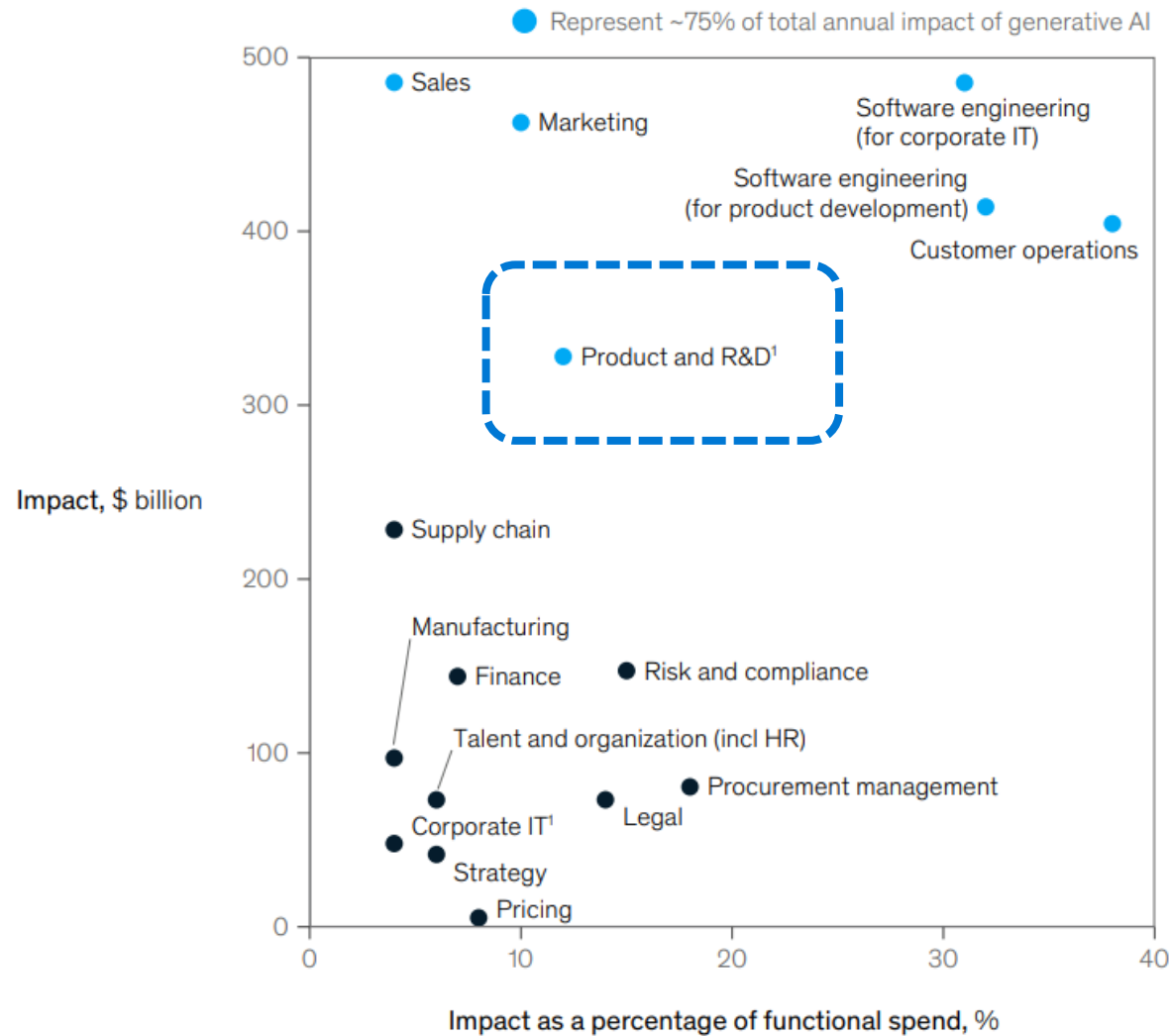- Productivity increases in core operations and the back office
- Acceleration of product development
- Re-skilling and change in capability profiles

Using generative AI in just a few functions could drive most of the technology's impact across potential corporate use cases.

Impact, $ billion

Represent ~75% of total annual impact of generative AI

Impact as a percentage of functional spend, %

Labels in chart: Sales, Marketing, Software engineering (for corporate IT), Software engineering (for product development), Customer operations, Product and R&D[1], Supply chain, Manufacturing, Finance, Risk and compliance, Talent and organization (incl HR), Procurement management, Corporate IT[1], Legal, Strategy, Pricing

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.
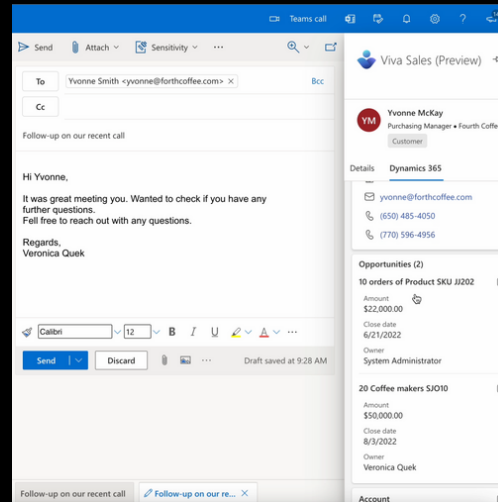
Generative design	Personalized sales co-pilot	Business intelligence
"Construct a lighter wheel suspension for a full electric SUV"	*"Prepare the customer response for my unanswered eMails. Provide personalized recommendations."*	*"Get me a report about autonomous trucks involved in harsh breaking events during the last 2 days"*
Generative algorithms can reduce material cost[1] in automotive up to **15%**, weight up to **50%** and engineering time up to **38%**.	By 2025, **30%** of outbound marketing messages from large organizations will be synthetically generated[2].	Makes data analysis and reporting easier and faster for everyone, regardless of their technical skills or experience.
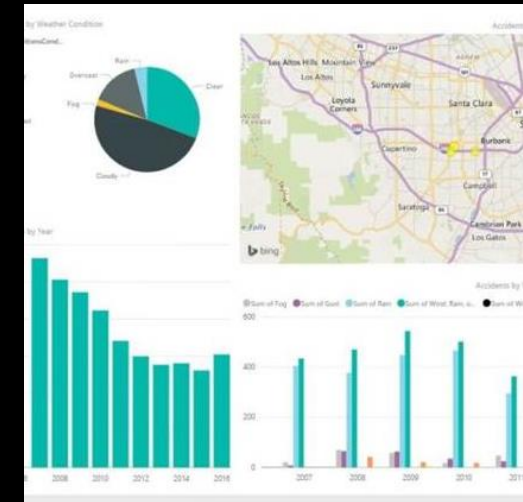
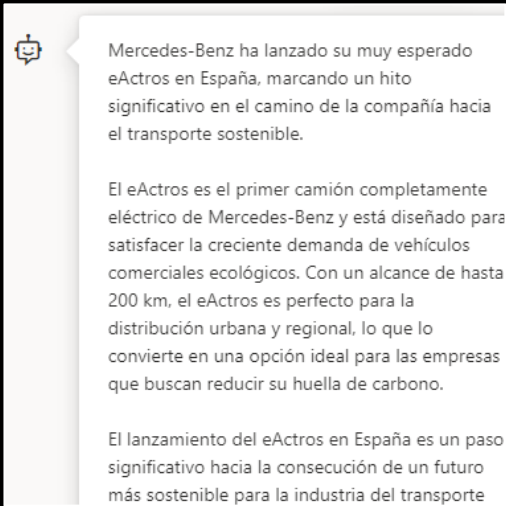| Suggest software code	Customer conversation bot	Document summarization
"Generate code leveraging the SDV API to determine the vehicle's fuel status"	*"Behave like a driver's assistant and answer customers' questions about the new Contoso truck"*	*"Validate this Portuguese legal document and extract UNECE R.155 relevant statements"*
Github Copilot can foster software coding by **55%** and generate up to **46%** of code[1]	Conversational chatbots can help in cutting operational costs by up to **30%** and can answer up to **80%** of all standard questions[2]	In a customer example document review could be reduced from 11 years to a few months with **80%** approval rate[3].

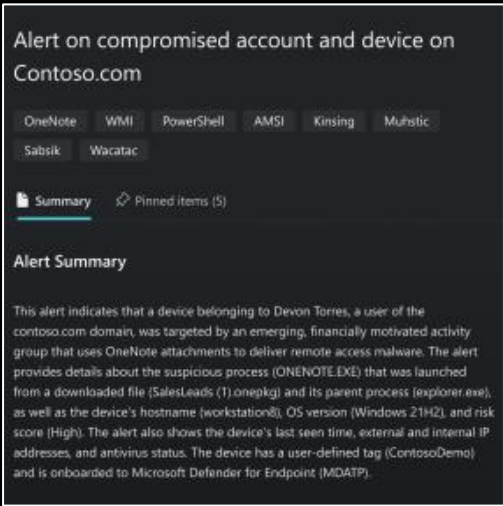| Synthetic scene generation	Public marketing content	AI-powered cybersecurity threat defence
"Generate 1000 potential accident scenes to validate the recent ADAS algorithm"	*"Draft an article for a newspaper celebrating our product launch in Spain!"*	*"Detect recent UNECE R.155 threats affecting our fleets and provide mitigation responses"*
Physically accurate simulation of synthetic scenes designed for up to **180** times[1] faster and efficient autonomous driving testing and validation at scale.	By 2025 **90%** of quarterly report material will be synthetically generated[2].	By 2025, lack of talent or human failure will be responsible for over **half** of significant cybersecurity incidents[3].

Azure OpenAI/ChatGPT Ecosystem (nearly 500 Plugins)

AI + Machine Learning, Announcements, Azure AI, Azure OpenAI Service

Mercedes-Benz enhances drivers' experience with Azure OpenAI Service

By Eric Boyd 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
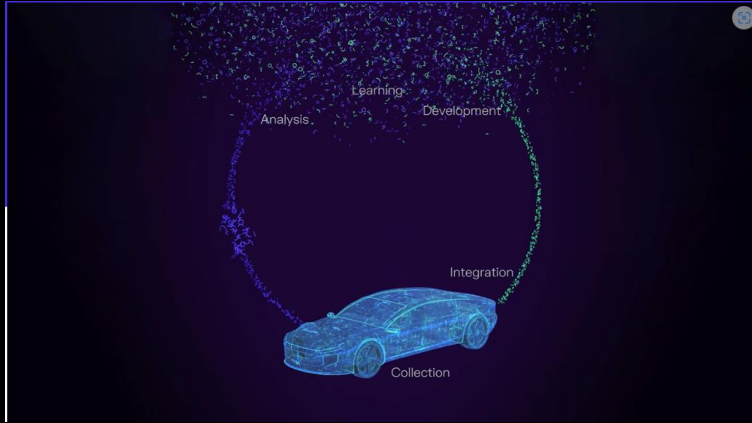
Co-pilot for R&D
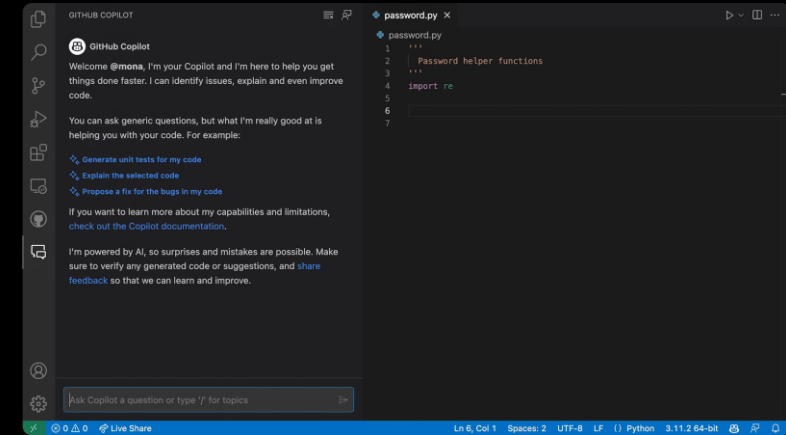
Cloud, Data & AI Strategy in place

"SaaSification" of Applications

Generative AI in Product Design & PLM

Example 1: PTC's Cloud SaaS Services
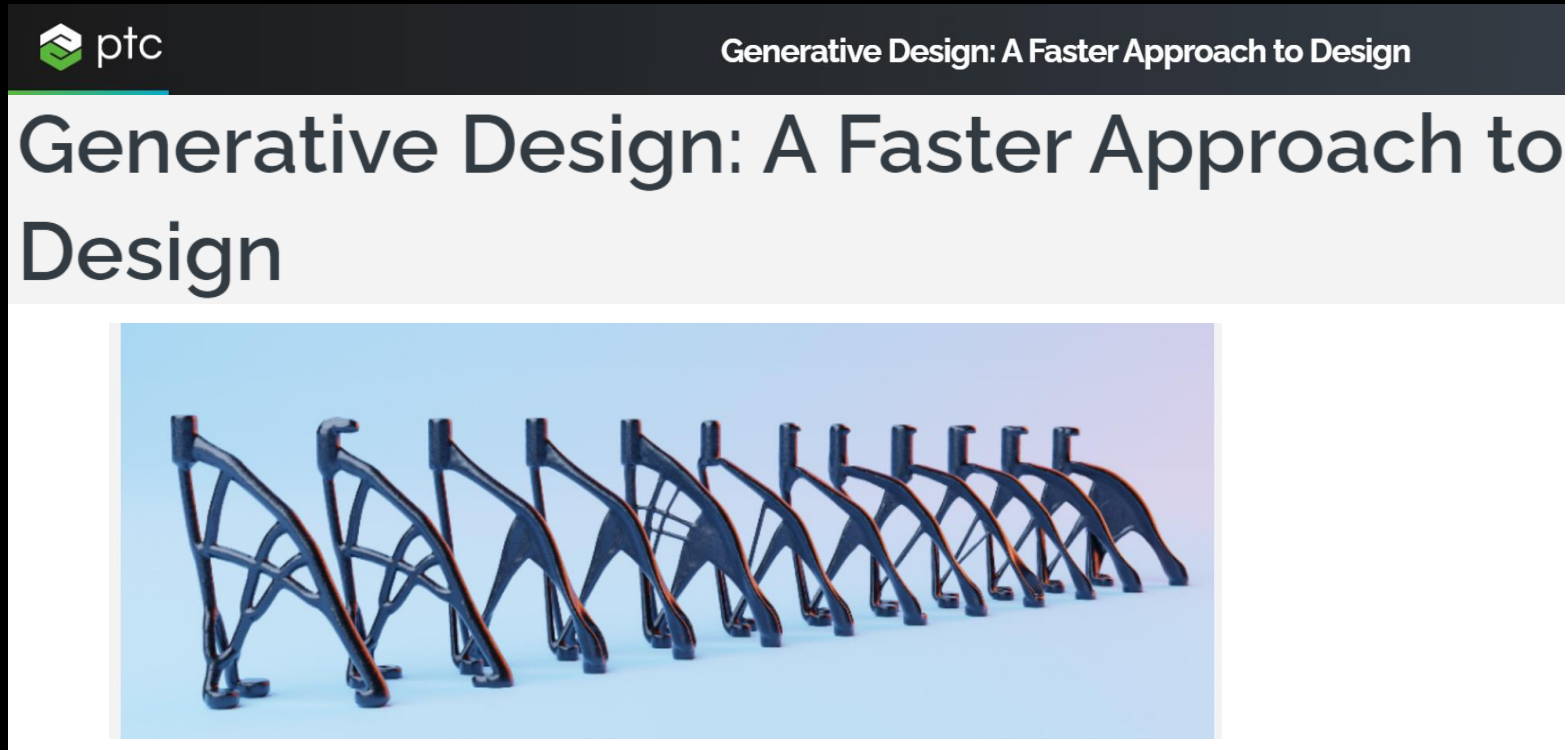
"Your product designers [...] **define the problem they want to solve**, using the language of design constraints, loads, materials, and manufacturing methods. The software then studies that problem, doing countless iterations, and **returns an optimum set of solutions** to the product designers..."

Example 2: Siemens & Microsoft Partnership

SIEMENS Digital Industries Software

THOUGHT LEADERSHIP April 28, 2023

How generative AI enhances the PLM process

"... 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."

https://1drv.ms/v/s!Al5XMkygOgegqfB7O6TXNOTcJWxcjQ?e=i3goIh
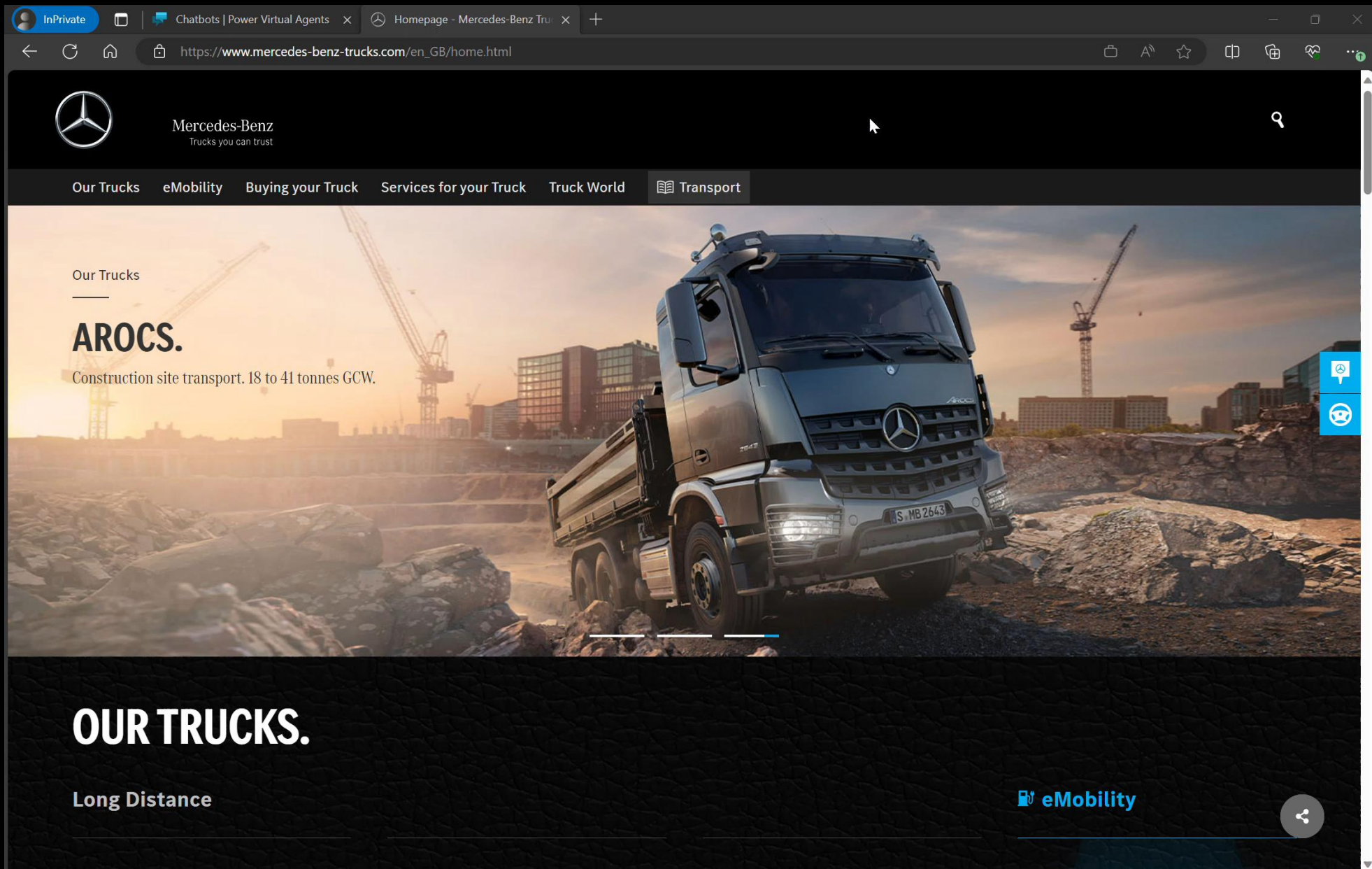
"Modern PLM" is a journey!

Where to start?

Think PLM as a "Digital Feedback Loop"

Engage customers

Optimize operations

Data + Intelligence

Empower employees

Transform products
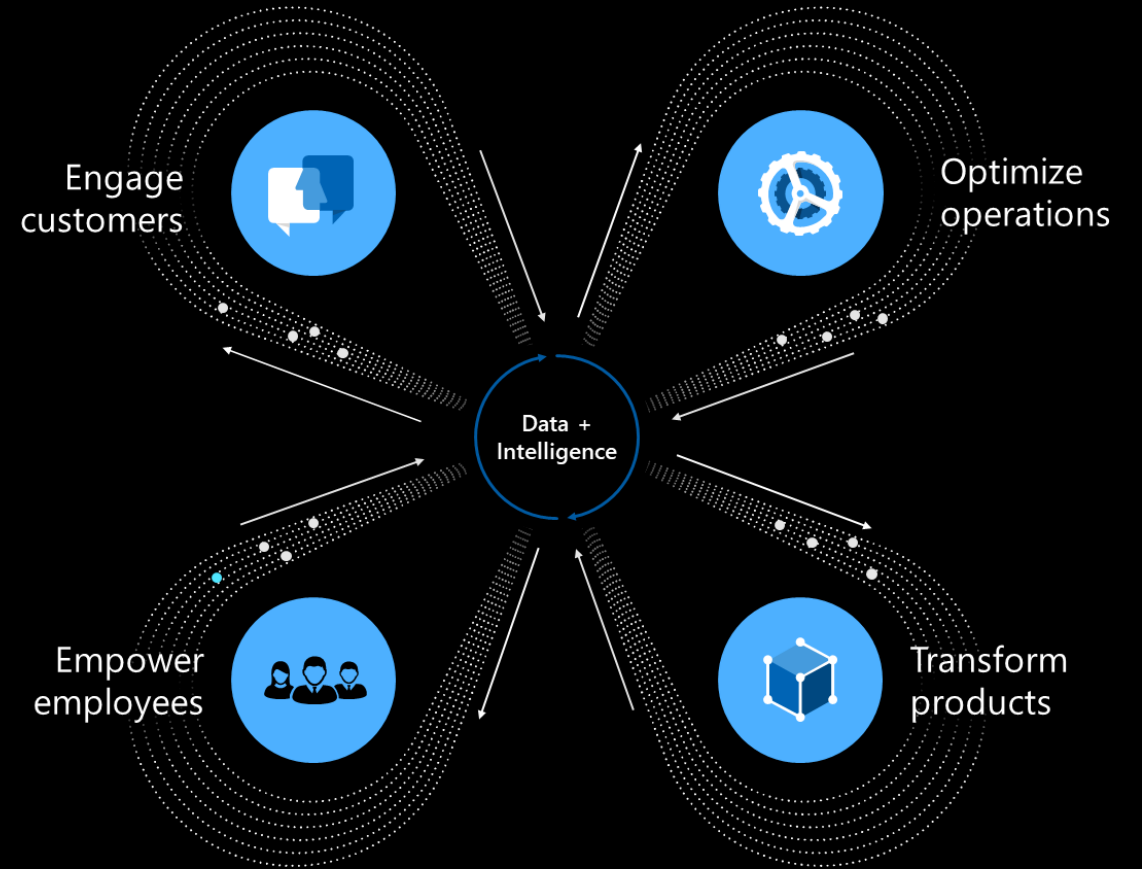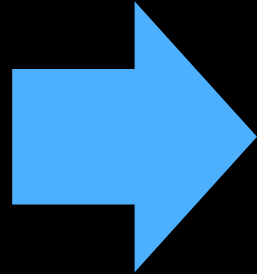
Establish a Modern PLM Data Fabric

e.g. Microsoft Fabric
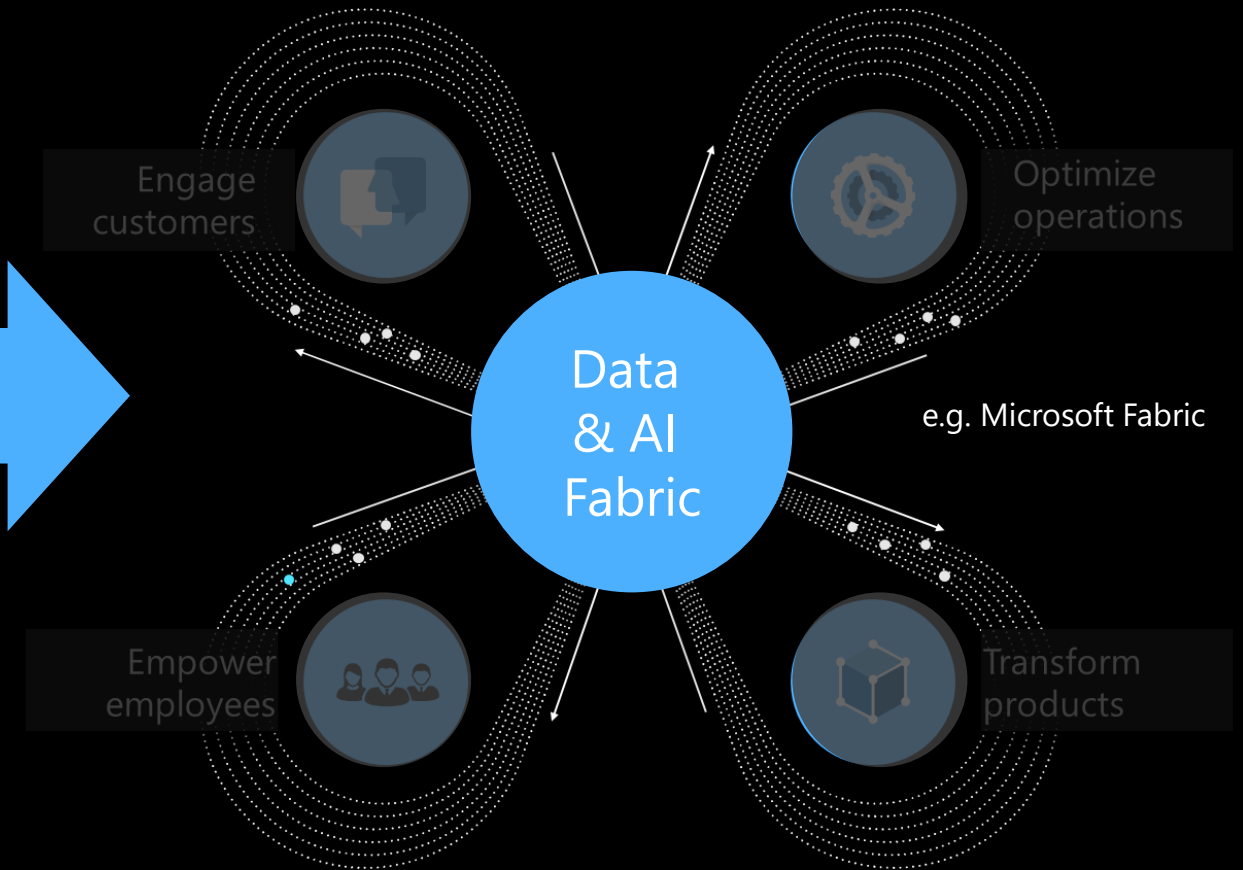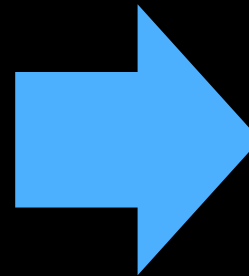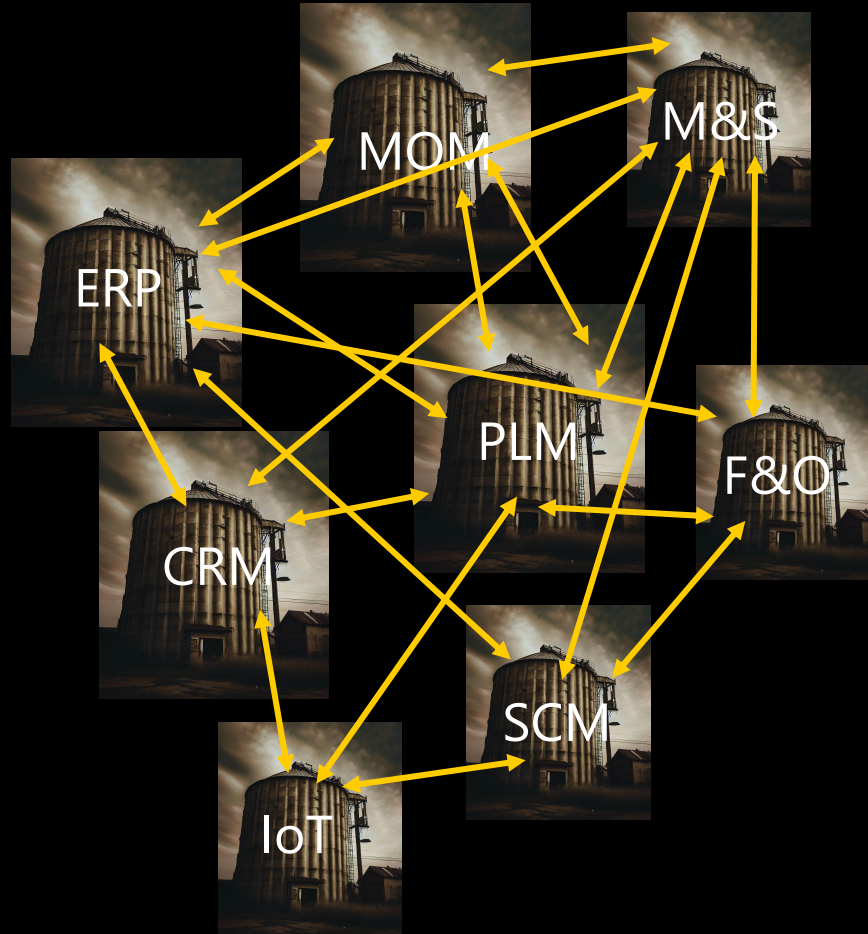
Note: Don't consider the "Data and AI Fabric" as a single corporate data lake!
Adopt the federated "Data Mesh", "Data as a Product" and "Semantic Graph"
pattern

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

Regulations & Standards

Customer requirements/ targets

Complete vehicle Functional specification

Complete vehicle Architecture & design

System Functional specification

System Architecture & design

Component Specification

Hardware Specification

Software Specification

Implementation

HW design

Homologation

Engineering release & acceptance

Complete vehicle Test

Complete vehicle Integration

System Test

System Integration

Component Integration & test

Software Integration & test

Hardware Integration & test

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**

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 Teamscenter, SAP in Microsoft Teams

Microsoft

Thank you !