

# DIGITAL LEADERSHIP IN AUTOMOTIVE

UBS INVESTOR FIELD TRIP, SEPTEMBER 17, 2020





**OFFER A UNIQUE DIGITAL  
EXPERIENCE.** 1



**PIONEER DIGITAL  
TECHNOLOGIES.** 2



**MASTER DIGITAL  
VALUE CREATION.** 3







# 01

## UNIQUE DIGITAL EXPERIENCE.

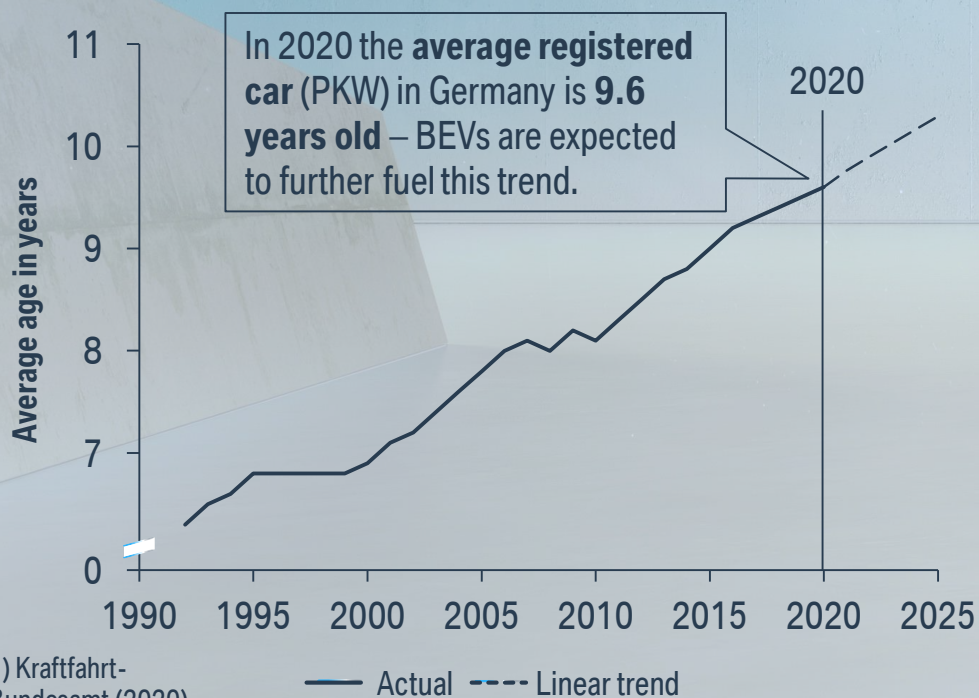


# UNIQUE DIGITAL EXPERIENCE. A BMW WILL BE THE BEST MAINTAINED DIGITAL DEVICE.

1

## CARS REMAIN INCREASINGLY LONGER IN THE MARKET.

Average age of registered cars in Germany.<sup>1</sup>



## A BMW REMAINS FRESH OVER LIFE CYCLE.

### Ever surprising.

New features across domains powered by excessive hardware capacity and flexible performance partitioning (i.e. on-/offboard).

### Perfectly maintained.

Continuous feature improvements and avoidance of costly technical actions following an iterative, data-driven, development approach.

### User friendly.

The customer decides, if and when an update occurs. Update failures are mitigated upfront and are reduced to an absolute minimum.

### Tech enabled.

BMW operating system facilitates over the air (OTA) software changes of all electronic control units (ECUs) in the car, down to the single line of code.



**BMW as the first established OEM to introduce a modular vehicle operating system (BMW Operating System 7) in 2018 with full over-the-air (OTA) capability via Remote Software Upgrades (RSU).**



# UNIQUE DIGITAL EXPERIENCE. WE ARE COMPLETING OUR FIRST GLOBAL ROLL-OUT FOR OVER 500,000 BMWs.

1



## BMW Maps.

New cloud-based navigation with significantly enhanced performance, intuitive destination entry, POI enrichment and excellent accuracy.



## Android Auto.

Wireless Android integration accessible via the Control Display, Navigation App within the Info Display and Head-Up Display.



## Connected Charging.

New connectivity services for more transparency about charging status, range, and optimization of route planning, including charging stops.

Update



## Connected Parking.

Parking as part of optimized route planning.  
New: forecast of parking situation at chosen destination, consideration of the vehicle size within On-Street Parking Information.



Update



## BMW Intelligent Personal Assistant.

New voice control functions, including opening the window, changing drive modes, new rules for automatically opening the driver's window based on GPS position, and a new visualization with driver/passenger orientation.

## New optional digital follow-up features.



## Adaptive M Suspension.

Automatic sensor-controlled adaption of the suspension according to the driving style and road conditions in a fraction of a second.



## IconicSounds Sport.

Authentic drive sound in the car's cabin via the audio system.



## eDrive Zones.

Automatically switch to all-electric driving Mode when entering "Green Zones" as a contribution for a better quality of life in urban areas.

\*Selected functions require certain hardware equipment

The next major upgrade is already in preparation for autumn 2020.





**02**

**PIONEERING  
DIGITAL TECHNOLOGIES.**

PIONEERING DIGITAL TECHNOLOGIES.

**14 MILLION CONNECTED BMW ALREADY ON THE ROAD.**

2

**1 DAY**

**700 million**  
GPS positions

**4 million vehicles with**  
**Real Time Traffic**  
**Information (RTTI)**

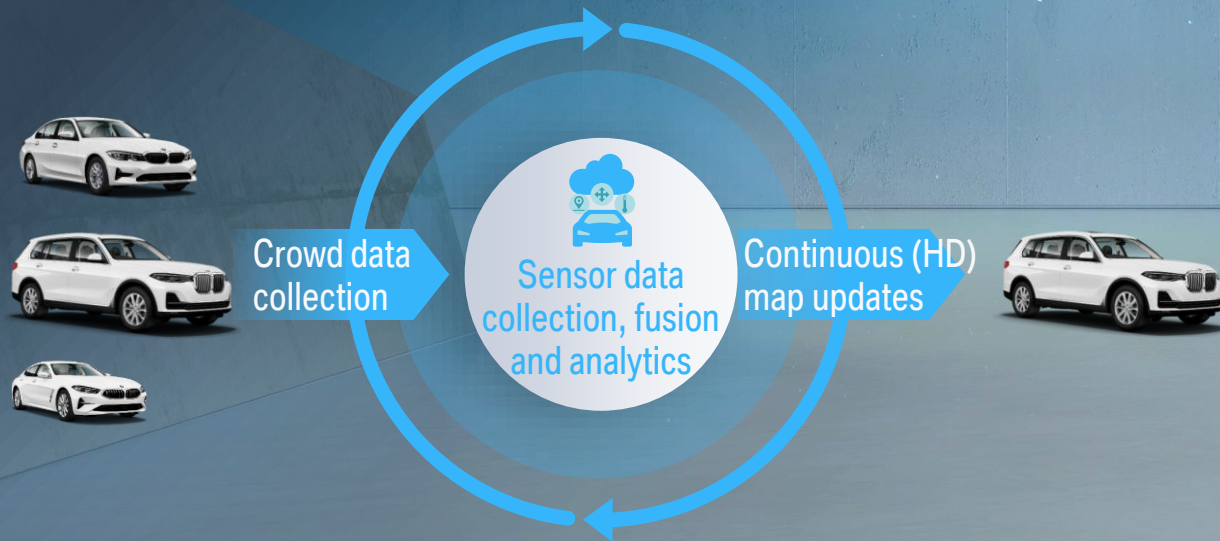
**Traffic sign**  
**collection: 25 million**  
signs each day...

**140 million**  
driven **kilometers**

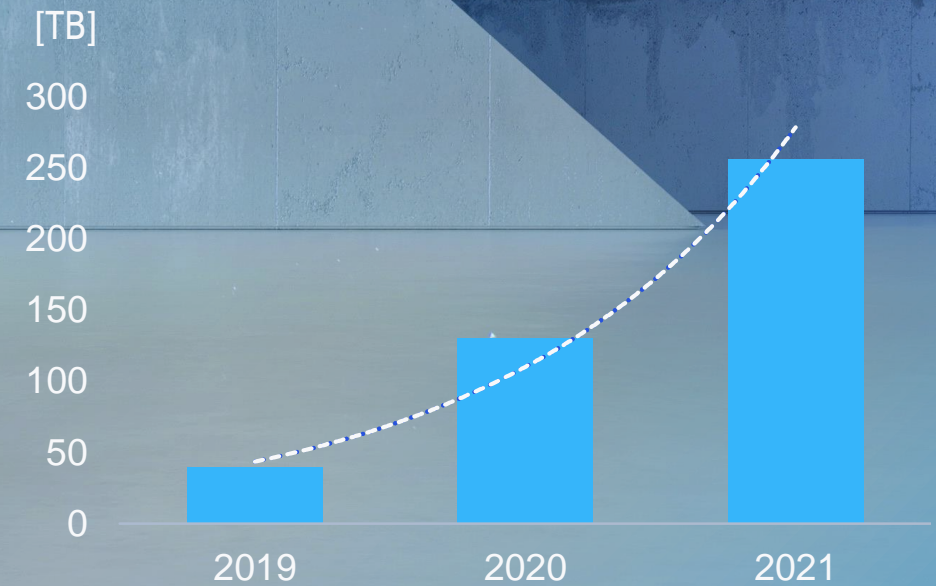


# PIONEERING DIGITAL TECHNOLOGIES. WE HAVE CLOSED THE LOOP AND SPEARHEAD DATA DRIVEN SERVICES.

## ADAS camera loop



## Collected crowd data for HD-maps\*



\*Estimation

**Data collection increases daily with the number of vehicles and across several sensors.  
Data-driven-services will be “the new normal” with an ever improving service quality.**



PIONEERING DIGITAL TECHNOLOGIES.

THE BMW iNEXT WILL BE THE FIRST PREMIUM CAR WITH 5G TECHNOLOGY.

2

## Benefits

- 1 Infotainment:** Cloudification of vehicle functions for max. performance and data freshness with low latency. High quality content streaming in real time.
- 2 ADAS:** Data for HD Maps, road level attributes and driving strategies shared with BMW Cloud in real-time. High-precision and reliable geolocation via Global Navigation Satellite System (GNSS).
- 3 Safety:** 5G-based interconnectedness with vehicles, pedestrians and the broader smart city infrastructure (V2X) facilitates a new level of safety applications (e.g. collision warning).





# 03

## MASTERING DIGITAL VALUE CREATION.



# MASTERING DIGITAL VALUE CREATION. BMW IS THE PREFERRED PARTNER OF TECH PLAYERS.

3



## BMW Digital Key for iPhone

- First OEM to introduce support for BMW Digital Key stored securely in Apple Wallet for iPhone



## Android Auto Wireless

- Among the first OEMs to enable users to connect their Android phone wirelessly with vehicle



## Amazon Alexa Integration

- Integration of cloud-based Alexa voice service into BMW and MINI models, following an initial BMW Connected skill in 2016



## Tencent Mini Programs

- Cooperation with Tencent to integrate Mini Programs Platform (MPP) and WeChat



## Intel/MobilEye RSD Loop

- Partnership with Intel/MobilEye to extract road segment data (RSD) from global BMW fleet



# MASTERING DIGITAL VALUE CREATION. WE HAVE A SOFTWARE MINDSET AND CAPABILITIES TO EXECUTE.

MOUNTAIN VIEW

LISBON  
PORTO



Critical  
Techworks

MUNICH  
ULM



SHANGHAI  
BEIJING

TOKYO

Already today, the BMW Group employs over 7,200 IT and software development professionals focusing on strategic core areas such as big data and analytics, artificial intelligence, autonomous driving, smart production and robotics.



# OUR FORWARD-LOOKING ASSETS.

## WHAT MAKES US UNIQUE IN AN HIGHLY COMPETITIVE DIGITAL ENVIRONMENT?

### WE OFFER A UNIQUE DIGITAL EXPERIENCE.

1

- Best digital maintained product across the entire lifecycle
- Intuitive and natural digital user interface and interaction
- Deep integration of 3rd party services (projected modes, content provider)

### WE PIONEER DIGITAL TECHNOLOGIES.

2

- Large connected fleet powering data driven development & services today
- Modular vehicle operating system with full over-the-air (OTA) capability
- Smart service partitioning to leverage power of the cloud

### WE MASTER DIGITAL VALUE CREATION.

3

- Cooperation with major tech players for first-to-market innovations
- SW mindset and skills to execute practiced over the past ten years
- Rigorous focus of own value creation on differentiating elements





WE ARE PREPARED.

