

# DVN Interior Presentation

Interior Experience 2030

HMI

Interior Lighting

Philippe Aumont, 2024



# Interior Was – Interior is



Excalibur pretend-oldie: dozens of gauges and switches



Tesla 3: just a single screen on a stalk



## Cabin Experience 2030

- **CASE** (Connected, Autonomous, Shared, (new) Energy)
- **EV/Architecture/(Partial) Automation**
- **New use cases, and massive effect on interior layouts**
- **“Homelike” Interior**
- **User Experience, HMI**
- **CMF, Color Materials Finish**
- **Interior Lighting**
- **Sustainability, Carbon-Neutral**





## Cabin Experience 2030

### 5 strategic imperatives response to trends

- User experience (UX)
- HMI technology, Smart Surfaces
- Interior Lighting
- New and Natural Materials
- Complexity, Costs and Partnerships





## Car Interior Design

- Designers reimagined the front cabin
- From buttons and gages to surfaces
- Hidden behind luxury surfaces
- Buttons available upon demand that would disappear again when no longer needed.



DVN Image



# Car Interior - Touch



- **Touch is the most intuitive of the human senses**
- **Children learn to interact through touch long before they begin to speak**

DVN Image



## HMI Definition

- **HMI is simply the interaction between a human and the hardware and software of a computer; by extension, to a vehicle**
- **HMI is not (only) interaction with a screen!**
- **HMI includes ADAS, Control Access and Visualization, Vehicle Parameters, Context Information, HVAC Control, Comfort Adjustment, Infotainment, Hand-free Phones, Interior Lighting, Voice, Gesture Control, Alert, HUD, Driver Monitoring, Driver Authentication, Mood Detection, etc;;**





## HMI as a System

- Human is a complex system, interacting through its five senses
- Human Centric HMI to be in full interaction
- Today's HMI is often distractingly complex, even if the car is moving
- Design and Development to include it



*BlackBerry, Denso to develop incorporated vehicle HMI*



## HMI System becomes Car USP!

- HMI and infotainment are at the center of today's auto interior consciousness.
- Displays are becoming the centerpiece, the masterpiece!—of the car interior.
- Display size positions the vehicle segment (as a combustion engine's piston displacement once did)
- OEMs are using their every new-model introduction, communication event, social-media channel to release new features, more powerful software, bigger screens, faster systems, augmented solutions.
- HMI is a differentiation lever, and a base for recurring revenue sources from subscription services.



*BMW HoloActive Touch, Concept Interior CES 2017*

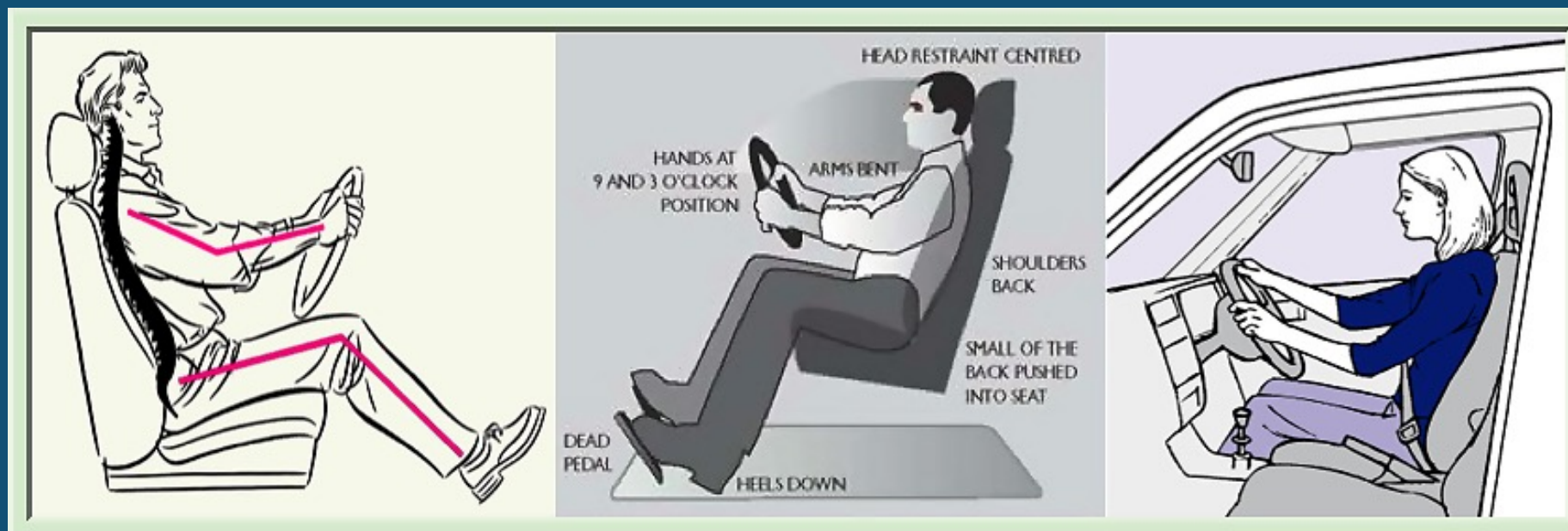


# HMI Architecture – Reach and Read

- Car Interior Architecture
- Position of the screen
- Driver (and Passenger) Reachability
- Screen Readability
- Interior Lighting



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## HMI - Display

- Window to the digital world, extension of Home/Office life with screens everywhere
- From a basic head unit to:
  - Byton M-Byte 48” pillar-to-pillar display
  - Audi Entertainment System CES 2019
  - Mercedes MBUX Hyperscreen, 56” glass Masterpiece
- Extension with HUD, Surfaces
- Instrument for an immersive driving experience
- Interior Lighting playing an important role



The prettiest car interiors on Planet Earth will make you forget chassis altogether

gq-magazine.co.uk • 1 min read



## HMI - Display



*Lincoln Nautilus*



*Audi's in-car entertainment system as shown at CES 2019*



## HMI – Dialog Lighting



- **Volvo Gives Autonomous Driving a Color – Ride Pilot**
- **Colors to signal the difference between driver-assisted mode and “unsupervised autonomous driving” mode in EX90.**
- **Make the transition from manual to assisted driving modes “effortless and intuitive”.**



# HMI - Display



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Panasonic Future Cockpit (Panasonic image)



Continental's Full-Spread Displays



## HMI Haptics

- Haptics is the use of tactile interfaces to provide touch or force feedback to the user.
- Touch-based feedback on screen and/or buttons
- Vibrating seat to inform the driver of a pedestrian about to cross the street
- Steering wheel to alert the driver drifting from the lane
- Reconfigurability and Personalization





## HMI - Safety

- **Driver Monitoring System (DMS) becoming Mandatory**
- **Camera, Best Sensor for DMS-OMS camera**
- **Thermal sensing interesting technology, especially to detect vital signs, if affordable**
- **The camera here effectively becomes a contactless interface, requiring no active participation between human and machine**
- **Driving while Impaired, alcohol, other substances**
  - **Driver's exhaled breath into a sensor**
  - **Behavior analysis**



*Karma SC1 Vision concept, camera for biometric identification, scans the driver for signs of tiredness, AI system to take control of the car in case of drowsiness*



# HMI Context Management

- Thermal
- Audio
- Navigation
- Mirrors
- See-Through (Pillars)
- Voice
- Gesture
- Assistant
- BYOD
- Etc.





## Lighting became the New Chrome





## Ambient Lighting

- A few well-placed lights is just as effective as a whole lot of lights,
- To make the cabin nicer
- To enhance consumer perceptions
  - More attractive
  - More spacious
  - Safer



BMW Image



## Interior Lighting and HMI

- Interior lighting more than Functional
- Ambiance and Decoration Lighting
- Interior Perceived Quality
- Light to increase comfort and feelings of wellbeing and safety.
- Help to find and use vehicle controls
- Lighting Alerts

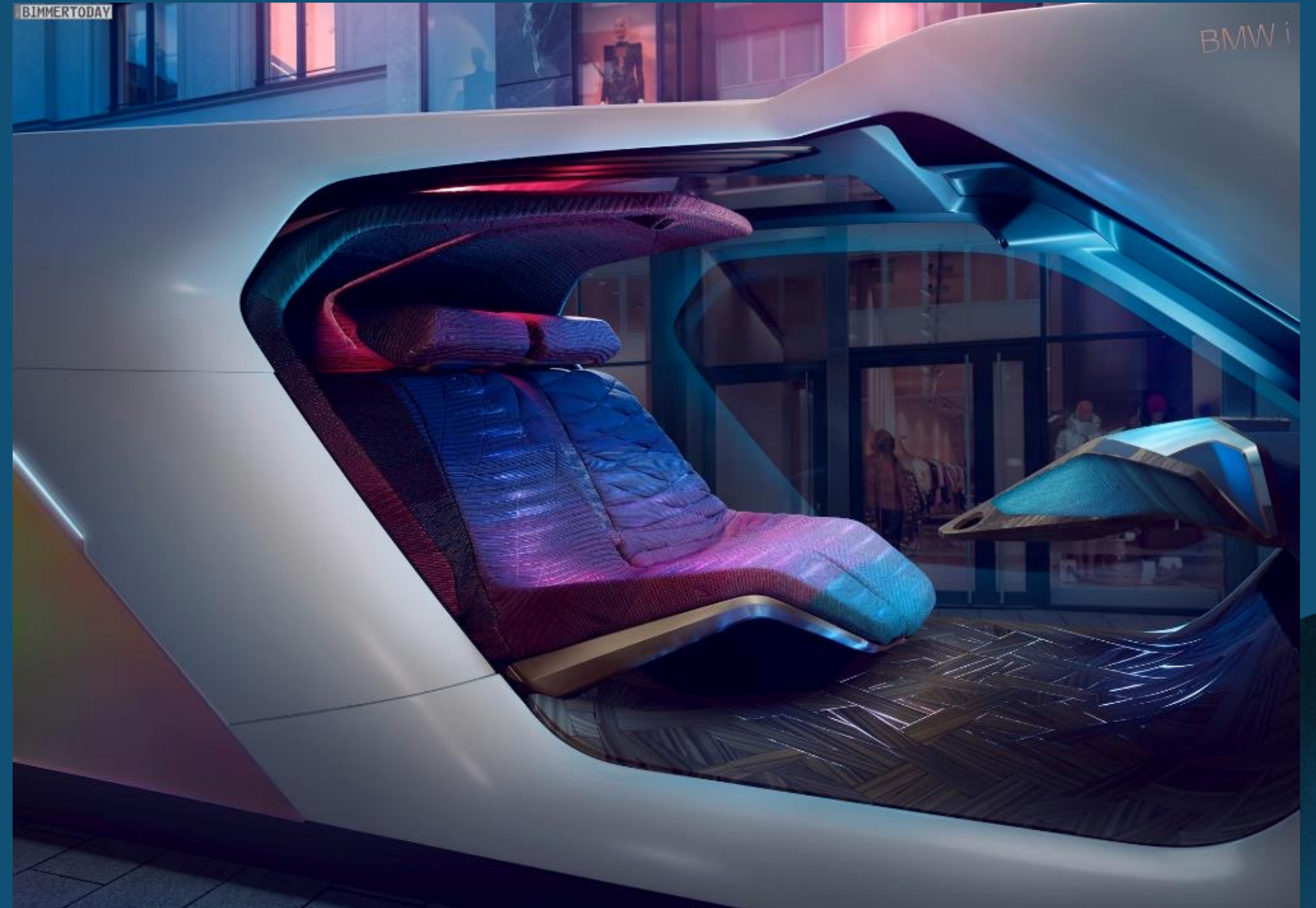


Forvia Image



## User Experience (UX)

- **Architecture, Display, Smart Surface, Interior Lighting and Comfort to enrich in-car functionalities.**
- **Seamless integration**
- **Adapt to context (weather, traffic, vital signs/detection, moods of vehicle occupants, etc) click.**
- **Dynamic UX channel**





## Interior Lighting as a Flexible Design Language

- Light can be merged into design elements
- Uniform or Dynamic Illuminated Surfaces
- Seat detail lighting
- Backlit Trim Pillars
- Floor lighting
- Dashboard lighting
- Surround illumination
- Panoramic Roof lighting
- Obstacle alert

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