DVN-I
Automotive Interior

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Editorial

From Ceiling To Floor: Electronics Everywhere!

MERCEDES-MAYBACH GLS (DAIMLER IMAGE)

Electronics continue to flood the whole car interior. Just look at some of the innovations presented in this week's DVN-I: Nvidia's driver monitoring system, Toyota Boshoku's drowsiness-suppressing seat, new HUDs from Nippon Seiki and Elektrobit —these examples demonstrate the high safety and convenience value electronics bring to vehicle occupants.

We also look this week at how electronics are being integrated with traditionally analogue car parts like headliners and steering wheels (which in turn are beginning to lose their wheel shape!). these increasingly bristle with sensors, LEDs, screens, touch surfaces, UV sanitizers, and all sorts of other electronics.

For many years, the headliner was just for decorative acoustic finishing of the car body. Maybe it had a few lights in it; maybe a cutout for a sunroof, but that was as

fancy as they got. Now it's becoming an overhead system mixing products, technology, and features monitored by millions of code lines. The same is true with steering wheels (and now steering yokes).

New technologies, electronics and software are the catalyst for innovation everywhere in the car interior, even where eyes seldom see. Quick and easy following of these rapid and accelerating evolutions of innovation is just one of the many sturdy reasons to become a member of the DVN-I community; come **join us!**

Sincerely yours,

Philippe Aumont
General Editor, DVN-Interior

In Depth Interior Technology

Headliner and Overhead Systems: Product, Market, Industry

Headliners and overhead systems are the components above occupants. Like dashboards and door panels, they traditionally haven't been the subject of much attention—not many headlines about them over the years! But like the rest of the interior, they're changing rapidly, so let’s take the opportunity here to finally give them their due.

FOAM PARTNER IMAGE

The product

Headliners bring the finish, the look-feel-and-touch, the noise control, and perch points for overhead lighting, grab handles, hanger hooks, sun visors, and other such kit in a vehicle. A headliner typically consists of multilayered composite materials with a face fabric—often tricot knit—with a foam backing, glued to melted polyurethane foam. This fabric-foam composite is affixed to the roof structure, again often with glue. die cut holes allow for sturdy attachment of grab handles and other such accessories.

HEADLINER ASSEMBLY (GRUPO ANTOLIN IMAGE)

For headroom, the headliner should be as thin as possible—especially as aerodynamic body designs are reducing rear-seat headspace. For impact performance, softness and energy absorption capability are crucial.

Face materials are usually foam-backed textile, cotton-napped textile, synthetic cloth, complex knit products, perforated vinyl—sometimes even leather, suede, or Alcantara. Recent developments include eco-friendly products made of recyclable or renewable adhesive and even face fabrics. Use of low-VOC or zero-VOC materials is also increasingly a focus.

In parallel, many other components are being integrated—enough that the simple headliner is becoming the "overhead system". They all need to be packaged together, but not always delivered as a unit; some of these components need to be attached to the body, and not to the headliner, such as grab handles (they must withstand an occupant's weight, which would pull the headliner right off the roof), rearview mirrors, and sun visors.

The overhead system also includes lamps. These are mostly for ambiance or task lighting, located above the center console, and also individual reading lights or contour decoration lighting. Rolls Royce has been putting their Bespoke Starlight Headliner in all their vehicles since last year, with data and solar system inspired motifs. See DVN Interior 22 October 2020 for more details. Sun visors are movable to block glaring sunlight from a range of angles, and also can include lights and a courtesy mirror, and sometimes controls for programmable garage door openers or other suchlike.

HOMELINK CONTROLS IN A SUN VISOR

HOMELINK CONTROLS IN A REARVIEW MIRROR

Controls for the likes of Gentex's HomeLink® wireless control system are integrated in visors or mirrors to allow the driver to open and close their garage door or access gate with a button-push. Gentex's next step is an in-vehicle home automation system app allowing an ever-expanding amount of home automation control from within the vehicle.

Market Opportunities

Every vehicle has a headliner of one kind or another, except convertibles. This means a nearly 1:1 overlap between the overhead system market and the vehicle market itself. Market progress is driven by the ongoing integration of additional functions within the overhead system.

As technology advances, new integrations become possible—a sound system, for example, with new super-thin loudspeakers that don't reduce headroom or weigh too much. Development of special exciter transducer coils mounted to flat panels to act as sound sources dramatically reduce overall thickness compared with a traditional cone-shaped speaker. The logical next step would be the integration of active noise cancellation, especially in EVs where NVH (noise, vibration, and harshness) are easier to notice because there's no combustion engine noise.

New overhead-system feature integrations aren't just for comfort and convenience. There's also increasing integration of sensors for occupant presence and monitoring. This facilitates a wide array of features such as seatbelt monitoring, child detection in hot cars, and automatic presets for specific occupants' preferences (seat adjustments, temperature control, etc.).

From a quantitative business standpoint, the cost ratio of a high-feature overhead system versus a basic headliner can be 10:1.

Plastic materials held around 70% of the automotive headliners market share in 2019. This can be attributed to favorable characteristics owing to the immense chemical competence of the material. Plastic is one of the most researched materials in existence. It has attracted enormous adoption in the global automotive sector due to its excellent mechanical performance coupled with great aesthetic appeal. Thermoplastics are extensively used in both passenger and commercial vehicles; they provide attractive surface finish, high impact strength, low mass, easy processing, and recyclability. Rising demand for lightweight interiors is likely to fuel the segment growth.

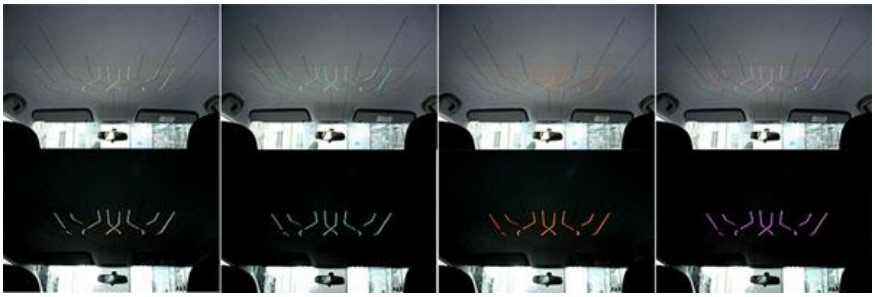
As an effect of the pandemic, we can expect the introduction of air purification systems, and UV sanitization systems such as products from Valeo, Yanfeng, and others.

The Industry

Major global headliner and overhead-system suppliers include Grupo Antolin, Toyota Boshoku, International Automotive Components (IAC), Lear, Howa, Hayashi Telempu, Feudenberg, Inteva, IMR-Industrialesud, SA Automotive, Greiner, Motus Integrated Technologies, and UGN.

GRUPO ANTOLIN IMAGE

Grupo Antolin claims one in four cars manufactured anywhere is equipped with their overhead products. In September 2020 they revealed their new range of retractable sun visors, which will include proprietary modular designs for premium car offerings by Jaguar and Tesla.



GRUPO ANTOLIN IMAGE

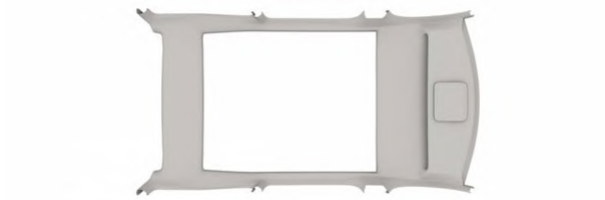
After trimming, the headliner is lasered with a process prepared for various designs and shapes, resulting in a variety of possibilities, such as day and night effects. A multicolor RGB version is also a possibility.

GRUPO ANTOLIN IMAGE

Another light integration is STAR-FX, a concept based on lighting integrated in the headliner with LEDs that define a variety of drawings and shapes.

Antolin's portfolio includes sustainable and lightweight headliners incorporating natural fibers and eco-friendly foams and adhesives.

Although the sun visor is a very basic item that doesn't look as though it's evolved much, first looks can be deceiving. Antolin's innovations include increasing anti-glare effectiveness, slide-on-rod mounting to extend the glare blocking range, reduced thickness, and integration of multifunction mirrors.



SUNROOF HEADLINER (SA AUTOMOTIVE IMAGE)

SA automotive, S Group Automotive, Shea Interiors, and SK Automotive have consolidated into one company, branded as SA Automotive. They develop sunvisors, lighting, wiring, speakers, sensors, consoles, front and side airbags, attachment systems, and head impact components with a variety of headliner processes such as bonded thermoset, thermoformed glass-filed polypropylene, thermoformed dry polyurethane, and injection molding behind fabric.

GREINER FOAM IMAGE

Greiner Foam has expertise in special foams. They make overhead components, rear parcel shelves, luggage compartment covers, and floor coverings.

For convertible roof compartments, their polyurethane technology offers an alternative to conventional convertible roof compartments consisting of multilayered sheetmetal structures or complex aluminum extrusions or magnesium die castings. Their technology also offers the advantages of low weight per unit area, combined with high rigidity and relatively low thermal expansion.

TOYOTA BOSHOKU IMAGE

Toyota Boshoku is a Japanese automotive component manufacturer and member of the Toyota Group of companies. Among many interior products including seating, they develop overhead systems including audio systems mounted on the ceiling so passengers in the rear seat can watch TV or movies and play video games

IAC produces a wide array of overheads, from standard headliners to fully integrated multimedia consoles. Their FiberFrame™ is a sustainable, lightweight natural fiber sunroof frame comprising 70 percent renewable content. This solution offers significant weight savings while improving the structural rigidity. They provide a full range of substrate offerings to meet varying requirements for strength, cost, packaging space, and energy management for every vehicle type.

Guilford Performance Textiles by Lear provides bodycloth and headliners. Lear has exclusive rights to the use of laser etching in automotive seating and headliner applications.

Motus Integrated Technologies' portfolio includes a wide range of overhead offerings, which they group in three categories:
• Base: headliner, attachment system, wire harness and structural components.
• Moderate: Includes all of the above plus head impact solutions and HVAC ducting.
• Complex – All of the above plus overhead console, grab handles, coat hooks and lighting.

Head Lining

Head Lining(sunroof)

HOWA TEXTILE IMAGE

Howa was the first company in Japan to develop head lining roofs in 1970. They use their own manufactured urethane reinforced with glass fiber. It's lightweight and provides sound absorbency, heat resistance and moisture resistance, while its high dimensional stability makes it particularly suitable for larger ceilings.

HAYASHI TELEMPU IMAGE

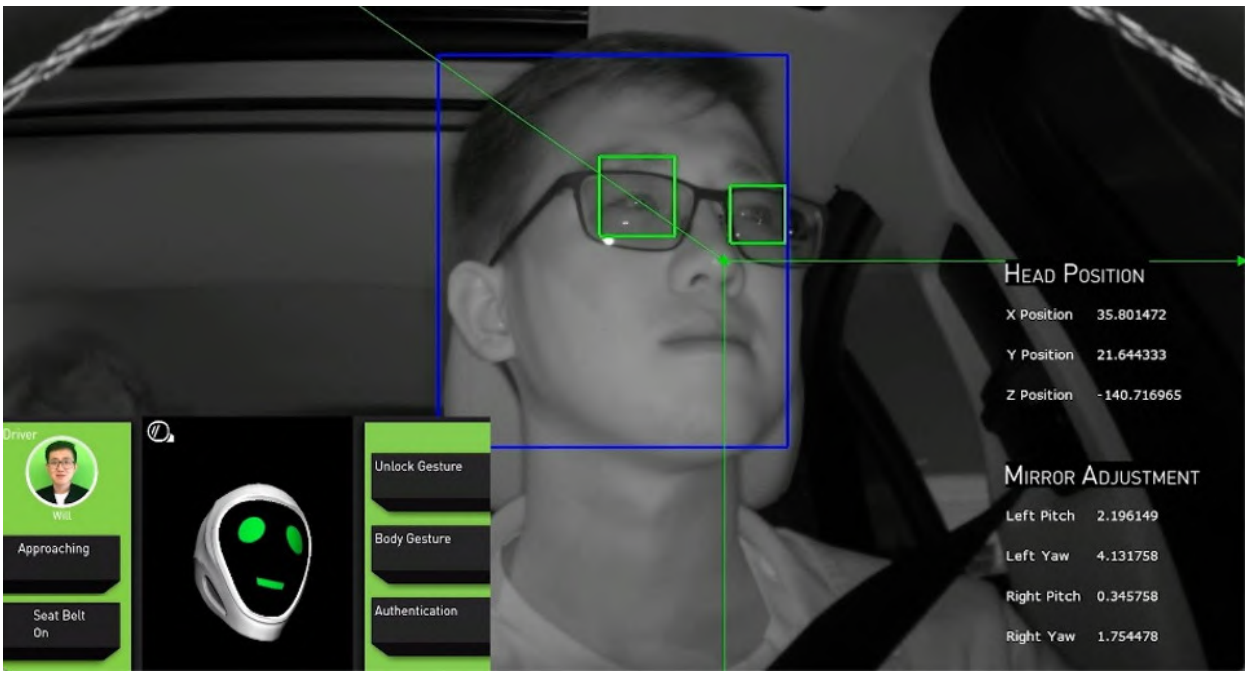
Hayashi Telempu is a Japanese interior supplier with a variety of advanced-technology products for the whole interior. Their LCD backlight unit is one example of their ahead-of-the-times product range.

IMR-Industrialesud IMR Automotive bought IndustrialeSud of Teramo, Italy from Johnson Controls in 2017. The company provides headliners, pillar liners, door panels, parcel shelves, and cockpits.

Interior News

Nvidia's AI Software Keeps Drivers Focused on the Road

INTERIOR NEWS



Nvidia's Drive IX cabin perception software provides advanced driver monitoring, personalization, in-cabin situational understanding, and intuitive AI assistants.

It's an open, scalable cockpit software platform that provides AI functions to enable a full range of in-cabin experiences, including intelligent visualization with augmented reality and virtual reality, conversational AI, and interior sensing.

Driver perception is a key aspect of the platform that enables the AV system to ensure a driver is alert and paying attention to the road. It also enables the AI system to perform cockpit functions intuitively. In an **online video**, Nvidia experts demonstrate how Drive IX perceives driver attention, activity, emotion, behavior, posture, speech, gesture, and mood

With advanced driver assistance systems automating more and more driving functions, human drivers have less of a task load to keep their attention from wandering, but must still maintain their attention at the wheel and build trust in the AI system.

Facial expressions are complex signals to interpret. A simple wrinkle of the brow or shift of the gaze can have a variety of meanings. Drive IX uses multiple DNNs (deep neural networks) to recognize faces and decipher the expressions of vehicle occupants. The first DNN detects the face itself, while a second identifies fiducial points, or reference markings—such as eye location, nose, etc.

The GazeNet DNN tracks gazes by detecting the vector of the driver's eyes and mapping it to the road to check if they're able to see obstacles ahead. SleepNet monitors drowsiness, classifying whether eyes are open or closed, and running through a state machine to determine levels of exhaustion. Finally, ActivityNet tracks driver activity such as phone usage, hands on/off the wheel, and driver attention to road events. Drive IX can also detect whether the driver is properly sitting in their seat to focus on road events.

In addition to driver focus, a separate DNN can determine a driver's emotions—a key indicator of their ability to safely operate the vehicle. It can classify a driver's state as happy, surprised, neutral, disgusted, or angry.

These capabilities help build trust between occupants and the AI system as automated driving technology develops, to create a safer, more enjoyable intelligent vehicle experience.

Toyota Boshoku's Drowsiness Suppression Seat

INTERIOR NEWS

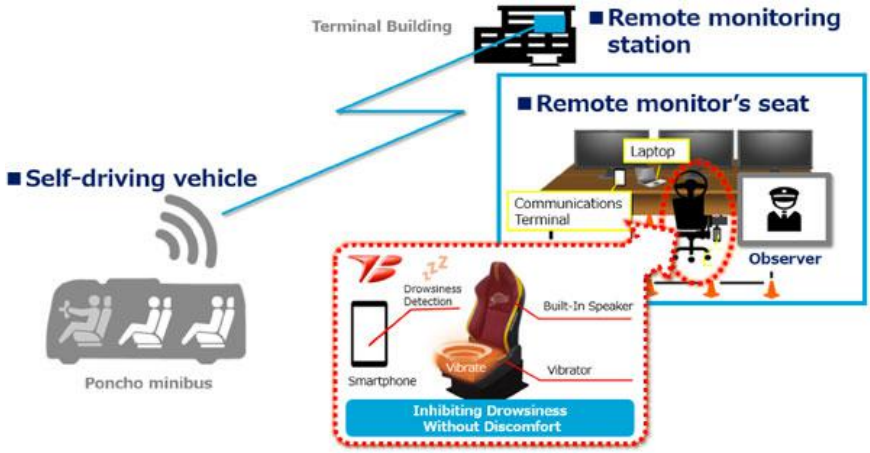
TOYOTA BOSHOKU IMAGE

Toyota Boshoku participated last month in an autonomous-driving demonstration experiment at Chubu Centrair, that is Central Japan International Airport in Aichi Prefecture.

Boshoku supplies their Drowsiness Suppression Seat System that detects signs of drowsiness and prevents dozing, leveraging the company's strengths in physiological data-based technologies to control five human senses.

This drowsiness inhibitory system comprises a smartphone application and a seat linked to the smartphone. The smartphone's built-in camera monitors the face of the seated person and gauges the level of drowsiness in real time in response to the individual's facial expressions. Based on the estimated drowsiness level, the system intermittently plays and stops music from the seat's built-in speakers while vibrating the seat in time with the music to prevent the seated individual from falling asleep. A proprietary algorithm is used to select songs that elicit nostalgic feelings in the seated individual to inhibit drowsiness by prompting excited emotions.

Installing the system in the remote monitor seat of an autonomous vehicle enables the observer to concentrate and monitor safety at all times, thus contributing to safer and more secure operations.



CONCEPT: DROWSINESS INHIBITION FROM A REMOTE MONITORING ROOM (TOYOTA BOSHOKU IMAGE)

Porsche Taycan HUD Developed Using EB Guide Tools

INTERIOR NEWS

Porsche's Taycan, introduced last 2020, uses a HUD (head-up display) developed by Porsche with Nippon Seiki, a Japanese company of experts in the design and production of driver information displays.

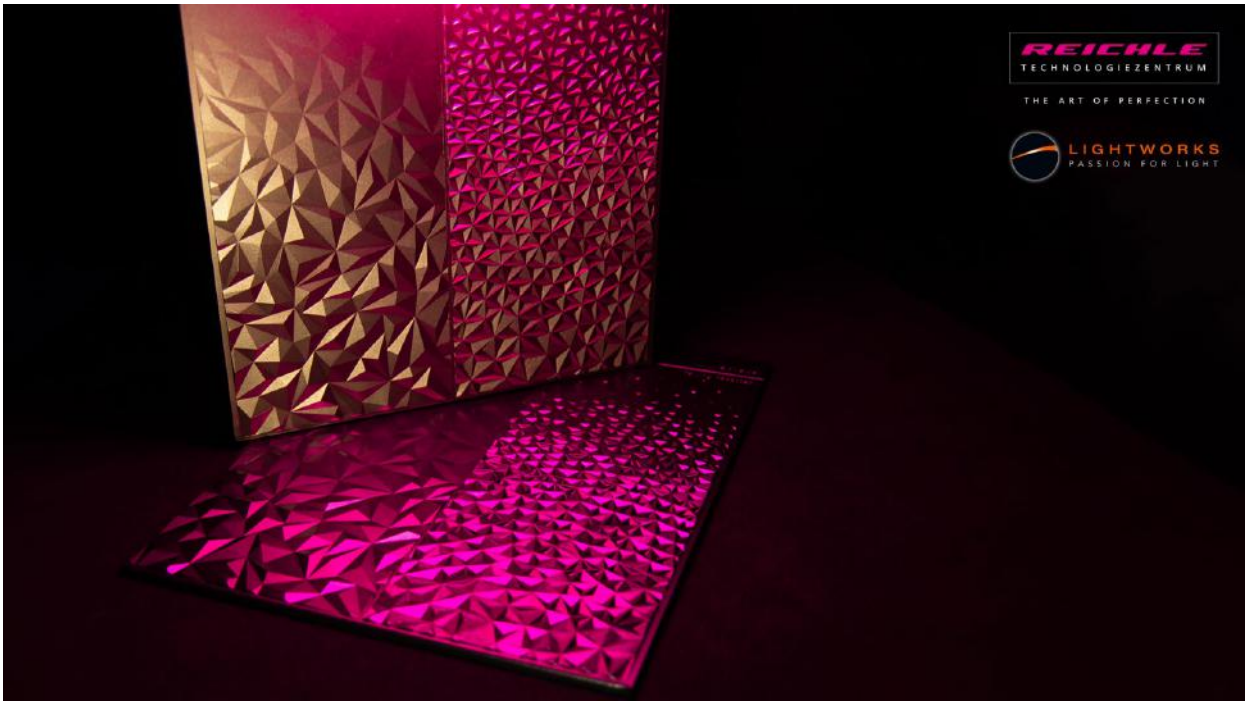
Nippon Seiki selected EB Guide from Elektrobit (EB) as a suitable tool for the HUD's software and graphical framework development. As the company already had years of experience creating advanced cluster instruments with the HMI development toolchain from EB, it says this was the logical tool with which to realize the HMI for the Porsche HUD.

EB provided Nippon Seiki with a graphical interface to develop both the UI look and feel and its logic behavior, reducing the need for software coding and enabling the development team to focus on their Thanks to an open architecture, the team was able to enrich the system framework and create custom visual effects for the display. Additionally, through the use of features such as built-in internationalization and skinning capabilities, Nippon Seiki ended up with a flexible and combined solution that fulfilled Porsche's luxury experience requirements.

EB Guide is Elektrobit's HMI development toolkit that provides a model-based approach to create top-level user interfaces. This provides a simple way to develop how the interfaces look and behave at the same time, to instantly view and test changes on desktop or PC, and to deploy interfaces to the target device without code compilation.

Cooperative Project for Special Lighting Effects

INTERIOR NEWS



REICHLE TECHNOLOGY CENTER IMAGE

By combining light systems and matching textures, an interplay of light, shadow and texture is created in a cooperative project between Lightworks and the Reichle Technology Center.

Lightworks is a specialist company for integrated lighting system development, from design, concept development, and prototyping to series production. Applications for their work include vehicle interior and exterior as well as non-automotive sectors. In cooperation with the Reichle Technology Center, a specialist for surface textures, interesting light effects are created by using matching textures with sharp edges for light refraction. That enhances the lighting effects and influences the interplay of light and shadow according to the customer's wishes. In Reichle's advanced design center, a wide variety of designs with different textural depths are developed for this purpose.

Lightworks enables individual customer-specific lighting effects with the help of light simulation, light laboratory, design, electronics development and series/industrialization project management. Results from the light simulation are converted into physically correct, photorealistic renderings and dynamic representations in the VR environments. Subsequently, the textures created fully digitally by the Reichle Technology Center can be viewed on the final product in context.

Upon request, Lightworks creates trend analyses and implements innovative material, surface, technology and process approaches in the project. Supplemented by Reichle's expertise in the area of surfaces, individual scenarios are possible, such as defined texture gradients in the surface. Mappings are then used to apply the selected texture to the component fully digitally and without restrictions for individual component geometries.

3D Printing for Vehicle Interiors

INTERIOR NEWS

The vehicle interior is becoming an oasis of wellbeing—with consequences for the choice of materials and manufacturing processes for interior components. 3D printing is one of the current key trends.

THE BMW I8 WINDOW GUIDE RAIL ALREADY COMES AS A 3DP PART. (BMW IMAGE)

There's a demanding balancing act between a high-quality appearance and the highest component safety for many car parts, but in the interior the challenge is magnified. Demand is only growing for individualized, ergonomically sensible, safe interior parts with a high-quality impression in terms of design and material selection. Manufacturers and suppliers are therefore constantly on the lookout for components and production processes that provide such degrees of freedom. Additive manufacturing (3D printing) is one such process. Additive processes offer the necessary freedom in component design, even though the technology is still in its infancy for mass production. One maker already using series parts from a printer in the interior is BMW. The Munich-based company recently opened their Additive Manufacturing Campus with the aim of industrializing 3D printing processes for automotive production and implementing new automation concepts in the process chain.

Since 2017, the guide rail for the window of the BMW i8 has been manufactured by printer specialist HP, using the multi-jet fusion process, which was further developed in collaboration with BMW. Up to 100 window guide rails can be produced within 24 hours, according to BMW. That’s not exactly *mass* production yet, but it's a very promising start.

Currently 3D printing is focusing on decorative parts. In the new Mini John Cooper GP, the interior trim on the passenger side with individual numbering for each vehicle, the metallic center marking in the steering wheel rim and the shift paddles behind the steering wheel all come from the 3D printer. In an earlier project, Mini customers could order individual cockpit trim and turn signal inlays.

3D-PRINTED DECORATIVE ELEMENT

The PSA brand DS used 3D printing technology from EOS (near Munich) for a limited-edition Dark Side model of the DS 3. Trim strips for the door handle panel were printed in an elaborate grid design made of titanium.

The Design Lounge

Steering Yokes: Are They Finally Here? (Part 3)

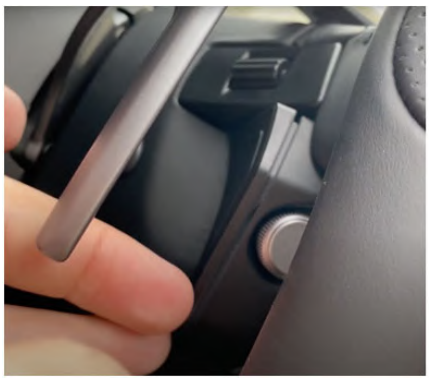
THE DESIGN LOUNGE

As we saw in the previous issue of the Design Lounge, Ferrari's Formula 1 racing success and technologies have been successfully adapted into their road vehicles but have lagged a bit behind in relation to other automakers' UX/HMI interfaces. Let now take a deep dive into their latest offering, the Roma.

The modern Ferrari, like any other kind of car lights up the interior like a Christmas tree when all functions are operational. Ferrari addresses this overload with their new UX/HMI by using a blackout effect for some their switching to contrast with the other switch types seen in the last installment of this series.

Incorporating capacitive switching that only shows the individual switches' icons and functions, when a finger passes near, Ferrari leaves the surface blacked out otherwise for a clean, uncluttered look that only becomes live when needed.

A compromise was made that the user must remember where the functions are on these switches to be used, but the effect is a much clearer aesthetic than constantly illuminating the icons.



Critically, only specific non-driver menu and display functions are incorporated with this type of switchgear. Items such as: the shift paddles, turn signals, horn, wiper, etc. are controlled via traditional switching methods.

Even the backside of the wheel is used to operate headlight flashing functions and menu scrolling.


Ferrari's use of various switch types can be best shown by how the turn signal control is now an elevated rocker switch located above the horizontal steering wheel spoke that can be operated by the thumb from the front, or the forefinger from behind.



This use of various switching technologies can improve the UX/HMI interface as Ferrari does on the right side of the steering wheel. The windshield is cleaned by pushbuttons to wash and a horizontally rotating wheel to wipe.

The driving modes use a vertical click wheel (a jog wheel) that synchronizes the cluster screen with a more detailed description for each driving mode. Above these and mirroring the capacitive blackout switches used on the left side of the wheel is another capacitive switch touch pad that controls the main cluster display in front of the driver.

This allows the driver to control what function is displayed and scroll through each of its detailed features and settings. A home and 'view max' 'button' is always shown

that allows the driver to select and return to what functions they prefer to use on the display.

As the shifting function is on the paddles and the engine rev limiter is on the upper steering wheel, the vehicle's speed and location can now take up the entire cluster display. This contrasts starkly to the traditional large speedometer and tachometer that previously defined a sports cars cluster and bridges the ICE convention to the new BEV world which does not require the traditional ICE information and controls.

Next week in this series, we'll look at how sport-oriented BEVs from Lotus and Tesla address the UX/HMI steering yoke.

News Mobility

_Car interiors Unplugged

NEWS MOBILITY

EASYMILE IMAGE

6. Autonomous _

(this story is part of an ongoing series introducing automotive interiors as an evolution of our habitat)

The original definition of the word *autonomous* relates to freedom of action and freedom of choice and designates a self-reliant entity conscious of the surrounding context as well as its own abilities. Autonomous vehicles, driverless cars, connected moving devices, four wheeled enclosed wagons, self-propelled means of transportation, own-stored power vehicles, horseless carriages… are depictions of the same thing according to context. Actually, they are the direct representation of context itself, a specific era, technology or social perception, all mobility related. Stretching vocabulary is stretching imagination because the ultimate circumstance of everything we design is the immediate larger perspective in which we introduce novelty.

Crafting and fabricating mobility is an art interweaved with humankind that cannot be lost or detached and in this precise historic moment, a milestone change is about to happen: our connected culture is succeeding our mechanical saga by the suppression of controls and commands from car interiors.In other words, the separation of the car from car interiors and the suppression of ‘car’ from modern vocabulary is about to

happen.In everyday reality though, there will be many shades and new definitions of ‘autonomous’ before we reach its absolute routine which we cannot predict but only invent as we go. All at once, ‘the front seat narrative’ becomes obsolete, whether as a driver or a participative front seat passenger, co-driver.Is our relationship to car interior spaces going to change?Possibly so. What is interesting though is the technological ability to reverse, detach and recompose functions between car and other forms of interior spaces and convey our up-to-date immediate surrounding space.Equally, by refitting interiors in a systemic context we are putting in place a new dictionary, expressing new schemes for our prospect itinerant habitat. And all that comes with a great responsibility. Digital and physical aspects as well as the perceived quality of interior spaces will be represented and expressed by all its constituents as one. New tech products that consider humans predictable by algorithms, unsophisticated beings or, very sophisticated thermostats, addressed to a hypothetic naïve inexperienced homo-economicus, that only suit for a tiny moment a business case, are destined to rapidly become obsolete and rejected beforehand by innate reactivity, short timed predictability and on the long run, complete lack of definition and character. Technologic applications are never lost but constantly evolving.In other words, autonomous, the topic of the following episodes, stands for the need of an ever-progressing performing supporting system that flawlessly and constantly enables mobility. In doing so we rearrange and relocate functions and controls and persistently reexamine autonomy within the immediate circumstances.

In a moment when the dominant trend is ‘predictions’ while in digital connected interior environments people become ‘the product’, we’d like to consider the state of transition and depict its vital features. Entering the age of autonomous vehicles means that the act of fabricating mobility is separated from ‘getting there’; the act of doing from the actual result. Autonomous also implies self-sufficiency, self-governance, and self-legislation. And that, includes a sense of self-worth and self-respect.

_to be continued…

*INDUSTRIOUS*_____

Møbilize: Renault's Brand for Mobility and Energy Services

NEWS MOBILITY

Møbilize is one of the four new business units created within Groupe Renault. Møbilize provides mobility, energy, and data-related services to other brands and partners, based on best-in-class open ecosystems.

Møbilize unveiled the EZ-1 Prototype, a purpose-designed vehicle for shared urban mobility. It is a compact and agile electric vehicle for 2 people. Its architectural model means the vehicle is only 2.3 m long and has a minimal footprint. Top-to-bottom glass doors give EZ-1 users an unhindered view of the surrounding urban landscape. The Prototype features an innovative battery exchange system, which means the vehicle can be used non-stop without charge-up downtime—crucial for acceptance of mobility as a service.

Møbilize Design Director Patrick Lecharpy says the EZ1 "s a mobility device that will blend in with the city. Agile, dynamic and inclusive, it is emblematic of the new Mobilize brand. It accompanies users in their lifestyle change towards more efficient and responsible mobility".

The EZ-1 is built according to circular economy principles. Made with 50% recycled materials, it will be 95% recyclable at the end of its life cycle thanks to the Flins Re-Factory.

It helps foster partnerships and new open ecosystems that bring significant advantages in timing and scaling-up, while also helping to solve the major challenges faced by the automotive industry: cars sit unused 90% of the time and lose half their value after three years. Plus, the EZ-1 prototype represents a step toward attaining zero-CO_2 targets.

Møbilize will also further leverage its existing portfolio of innovative mobility and energy startups to help co-create the best solutions for customers, including smart

charging solutions and advanced energy storage solutions, and new ways to facilitate EV uptake.

All these announcements are in line with Groupe Renault's target of carbon neutrality and ambition to develop value from the circular economy.

General News

Antolin, Net4Things in Connected Car Pact

GENERAL NEWS

NET4THINGS IMAGE

Grupo Antolin and Net4Things, a Spanish specialist in mobility and data-driven services, have signed a strategic agreement to develop connected cars. Grupo Antolin wants to use the potential of Net4Things' Global Mobility Platform to leverage new solutions and business opportunities for driver services based on data analysis.

Net4Things was founded in 2012, initially focused on providing Platform as a Service (PaaS) solutions for service providers in the domains of smart homes, connected cars, and e-health.

A recent study by *Market Data Forecast* reveals that the European connected-car market alone expects to reach almost €30bn by 2025, representing a CAGR of seven per cent, from 2020 to 2025.

Increased connectivity, new monitoring technologies inside the vehicle, the use of data to offer a better travel experience, and the need for permanent connection are the main objectives of this partnership. This interior interacts with passengers through state-of-the-art technologies such as dynamic lighting, monitoring systems, and smart touch surfaces.

Keiper Mechanisms Back in China

GENERAL NEWS

Johnson Controls announced their acquisition of Germany-based Keiper Seat Structure and Mechanisms in December 2010. In 2015, Yanfeng Automotive Interiors was created as a joint venture between Yanfeng Automotive Trim Systems (a wholly-owned subsidiary of Huayu Automotive Systems, the component group of SAIC Motor and Johnson Controls). Adient was founded as a spin-off from Johnson Controls in 2016.

Adient Yanfeng Seating Mechanisms Co was still existing in China, as a souvenir of this prestigious joint past. But now the new name of the company is Zibo Seat Mechanical Parts in Chinese, and Keiper Seating Mechanisms in English.

A new use of a well-known brand with a proven track record of successful mechanisms is a probably brilliant new spring board for future success—let's watch

and see!