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Weekly Newsletter

DVN-I
Automotive Interior

NEWSLETTER #152

Editorial

Console: Central To The Car Interior

In the late 1950s came a novel idea for driver and passenger seats, aiming to provide individual seating arrangement. Bucket seats eventually liberated a new space, right in the middle, evolved over decades to the most socially engaging part of the vehicle: the center console. Read more about its history in this week's Coffee Corner. As originally, today they're still mostly made from plastic. Lately, though, alternative materials are popping up—light weights, naturals, new materials that make the console more attractive…some consoles are even made of glass, which is becoming a design element (as we've **previously reported**) and structural material. That's the focus of this week's in-depth coverage. And our report on the history of the cup holder complement the (center) perspective!

The console is not just central to the Interior, but also central to HMI. That will be a primary main topic at the DVN-Interior Workshop next month, on 25-26 April in Köln. BMW; Forvia; Grupo Antolin; Valeo; Kurz/PolyIC, and many other automakers and suppliers will present their latest innovations and ideas in this constellation of foci. There will also be a materials-and-sustainability subtheme, with presentations on the holistic approach of companies like Grammer.

The Workshop docket is almost final; you can see it **here**. You'll not want to miss this grand event—**register now** while it's on your mind! We're looking forward to seeing you there.

Philippe Aumont
General Editor, DVN-Interior

In Depth Interior Technology

Is Tomorrow's Console Made of Glass? This Company Says Yes!

FLABEG GROUP IMAGES IN THIS ARTICLE

With the trend for central console designs to be larger, more curved and more free form, automakers have begun to pay more attention to interior trim providers and their abilities to mold sleek new surfaces to match makers' design directions. These consoles are positioned right in the face of the car occupant, who can see and scrutinize all the details, and the materials needed to make these designs are revealing themselves to be increasingly crucial.

Dr Matthias Schiller is chief technology officer and director for product and process development at glass specialist Flabeg Group. He says innovative glass processes can revolutionize the vehicle cockpit, reshaping the appearance and functionality of the center console: "With the availability of touchscreens, design trends have moved toward uniform, but smarter surfaces without visible control elements. The main advantage of this trend is intuitive operations such as tapping, dragging and dropping or swiping with one finger, turning, pinching to shrink or spreading to enlarge objects with two fingers".

Flabeg, based in Nuremberg, Germany, is a market and technology leader in glass for functional automotive applications such as mirrors; HUDs; instrument panels; display covers…and center consoles.

Flabeg automotive glass global sales director Lars Frick says "design is moving this way because, in the end, it gives an extraordinary and futuristic appearance, that is what consumers are looking for. Glass is an ideal material for future projects because large and smooth cover designs made from glass have a lot of advantages instead of using plastic. Furthermore, glass is also nice to touch and feel and resistant to scratches and fluids such as alcohol used to clean the surface. Something very interesting to consider as well is that big plastic display covers have a higher weight compared to glass. Glass can be very thin, light and robust at the same time".

One key pain point of a large, flat dashboard is its usability. Frick says, "These console designs are like having iPads in your car. However, in my living room I don't need help finding the buttons on my iPad because I can stare at them. In a car, I'd rather not. We can ensure [automakers] can deliver these sleek, modern designs, without sacrificing safety". With their automotive interior facilities in Furth im Wald, Germany, Flabeg can mold individual peaks and troughs into one piece of glass. Schiller says, "Surfaces with integrally-formed objects—like guides for the fingers, raised or grooved buttons, sliders or jog dials—can assist the operator when interacting with the touch display, without visual cues". In other words, giving users a fixed point to find with their fingers is expected to help drivers

navigate their consoles without taking their eyes off the road. That's of paramount importance given the **enormous safety drawback** of controls that can't be operated by feel and require the operator to take their eyes off the road.

The standard thickness for automotive glass design is between 1.1 and 2 mm. To include specific designs in this surface and reduce the risk of breakage, Flabeg chemically toughens their glass; they harden it by bathing it in potassium salt at more than 400°C, which causes the glass to swap its small sodium ions for the larger potassium ions. The glass winds up more flexible and resistant.

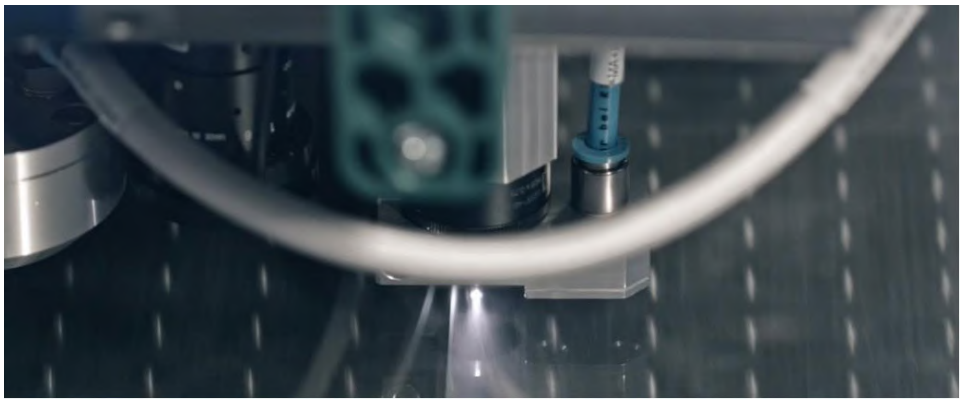
With advances like this, glass of between 0.7 and 10 mm thick can be bent. According to Flabeg, there are traditionally two different ways of bending glass for automotive designs: press bending and sag bending. Both methods begin by warming the glass above its softening temperature until it can gently bend. Press bending pushes a tool into the glass to form the desired shape; cools it down, then anneals it to relieve the internal stresses. Sag bending involves letting the glass slump down into a premade mold. For special parts, like the 3D free-form designs for automotive consoles, the sag method can be augmented by a vacuum, wherein a mound and suction are used to form the glass into complex shapes.

Forming physical characteristics into the console does mean limiting designers' flexibility more than would a purely software-based user interface. Schiller says, "You can change the functionality of the buttons and what they signify for the software behind the glass. There doesn't have to be only one button for the temperature and one for the radio. One button could scroll through menus so you can adjust the volume or the temperature with a fixed slider. This also means you can have buttons without cluttering the entire dashboard with them".

When drivers do need to glance at the dashboard, the functionalities must be quickly and easily seen and understood. This means minimizing the light reflected by the glass. Traditionally this would involve an antireflection coating—similar to that applied to eyeglasses and camera lenses—which can minimize reflections to below 1 per cent on flat glass. But this solution is no good on curved glass; antireflection coating always has a tint when observed from an angle. Fine for eyeglasses and camera lenses, but not compatible with console designs. Instead, automotive applications use etched-surface glass. Etched surfaces are created with hydrofluoric acid, which makes tiny structures in the glass so it is imperceptibly uneven. These structures reflect light at a variety of angles, thus reducing the amount of light reflected into the driver's eyes.

All these processes are carried out in Flabeg's clean rooms and automated production lines. The glass is driven around by small, autonomous robots. To ensure screen-printing quality, there's a housing around each piece of machinery and overpressure inside. This minimizes the disturbance caused by dirt. After the robot delivers the finished product from the cleaning room, the glass goes through the company's automated, 100-per-cent inspection process: four cameras analyze 16 channels of light from different angles. If they pick up an unexpectedly dark or bright spot, this could mean an accidental hole or piece of dirt has gotten into the glass. If they pick up a line of spots, this could indicate a scratch. After it has been checked for design deviations, the glass is tested in a variety of temperatures; humidities, and pressures. Schiller says, "Alongside dimension, movement and cutting alignment checks, we also do regular lab tests, like climate chamber tests, anti-fingerprint tests, color measurement tests, [and paint-adhesion] tests".

These tests are particularly crucial when it comes to installation. As glass expands less than plastic when heated, fitting these large consoles into plastic dashboards poses a challenge. Schiller again: "You have to be wary of how the surrounding design will react between -40 and +60 °C. You must leave enough gaps for the plastic not to expand too wide and then break the glass from the console. That's another reason why we want the console to be one piece of glass, so we only have to worry about the frame positioned around the glass". Moreover, the glass must be seamed with an angle on a 90° laser-cut edge to ensure it is rounded off enough to avoid scratching the surrounding system when installed.



LASER-CUTTING PROCESS

With safety at the heart of the company's integrated physical button shapes, it's hard to ignore Covid-19 and potential further pandemics. Looking to the future, antibacterial coatings seem likely to become a big thing. Flabeg plans to begin investigating this, both for automaker interest and for potential pandemic selling points. The antimicrobial properties of silver, for example, are getting a hard look.

Even without special antimicrobial treatments or inclusions, though, a large glass installation is inherently hygienic. Frick says, "A monolithic piece of glass is not only easier to clean than classical buttons, it's also cleaner by design. In your car, you have gaps, meaning dirt gets stuck and the car is unhygienic. With glass, you have less problem with that. It really is a material of the future".

Glass likely also has recycling advantages over plastics, assuming the glass console is constructed so as to allow disassembly at vehicle end-of-life.

Interior News

IAC FiberFrame Saves Weight

INTERIOR NEWS

IAC IMAGES IN THIS ARTICLE

International Automotive Components (IAC)'s core products are instrument panels; consoles; door panels, and overhead systems. Headquartered in Luxembourg, they have over 19,000 employees in 18 countries. The group comprises the former global interiors divisions of Lear and Collins & Aikman, with the addition of Stankiewicz; United Technologies; Automotive Industries, and Masland Industries.

The company's FiberFrame™ technology is invisible to the vehicle occupant, for it's covered by the headliner. It frames the sunroof using lightweight natural fiber composed of 70 per cent renewable content, and weighs as little as half of a conventional metal-reinforced sun roof frame, while improving the structural integrity.

Developed with BASF, it was introduced on the 2017 Mercedes-Benz E-Class, which was reportedly the first automotive roof frame entirely made of nonwoven natural fiber composites. It uses IAC EcoMatHot natural fiber-based prepreg developed specifically for this application—prepregs are laminate composites of fiber sheets impregnated with polymer resins that have not been fully cured. The fiber mat in this case is impregnated with a

BASF acrylate-based resin matrix called Acrodur 950L. It is a water-based, formaldehyde-free, one-component system.

The IAC process begins with wet-impregnating the dry natural fiber mat—bast fiber, here—which is done by an outside prepregger. Because Acrodur is water-based, impregnation is thorough. Wet impregnation also allows for easy application of additives such as colorants and flame retardants. The fiber mats are dried after impregnation with a conventional convection oven or with radio frequency energy. IAC then receives the prepregged fiber mat, which is still soft and flexible. The frame is then manufactured in-house by IAC in a hot molding process.

Fritz Schweindl, IAC director of advanced engineering, says it was relatively easy to integrate the Acrodur prepreg into IAC's production system: "The natural fiber components that are strengthened with Acrodur are ideal to mold; they are environmentally friendly and save time during the production of the composites. Furthermore, the product is low in emissions, which means that it is safer to work with".

IAC also produces the headliner; the outer-rear wheel house liner; inner wheel house cover, and rear seat cover for the vehicle.

Valeo Immersive Interior Fascia Becomes Real

INTERIOR NEWS

BMW IMAGES IN THIS ARTICLE

Last October, we **reported on** the four CES Innovation Awards Valeo received for the 2023 show-year. One of them was for their immersive fascia concept. Interactivity and safety are at the core of this decorative crystalline system that integrates human-machine interface; dynamic lighting, and backlight. The system has a metal aspect when off. Once activated, the metallic-when-dormant decoration goes translucent and the interactive interface appears as a sparkling light show. Lighting is used for ambiance with animation and also includes functions for enhanced safety, such as warning signals.. The eye-catching design and combination of features delivers a highly specific and strong brand signature.

This concept now becomes real, with this picture taken recently at Valeo's Rakovník plant in Czechia. The plant was established in 1994 by Siemens and Ateso. It became Valeo in 1995 to manufacture air conditioning systems and front-end modules. In 2019, Valeo opened a second factory dedicated to manufacturing comfort and driving assistance systems, and over 15 million ultrasonic sensors will be produced annually there.

The Surprising History of the Cupholder

INTERIOR NEWS

1991 LINCOLN CUPHOLDERS (CURBSIDE CLASSIC IMAGE)

At DVN Interior, our primary main objective is to provide content relevant to the automotive interior community—even when it's not our own writing, and particularly when it's in a non-mainstream location, not easily found. To that end: take a look at this grand, comprehensive **history of the in-car cupholder**. It's mindblowingly detailed, and digs into the cultural changes (and clashes) which started this seemingly-simple (actually quite complex) car cabin feature on its difficult uphill slog from useless, primitive things to their current ubiquity and utility.

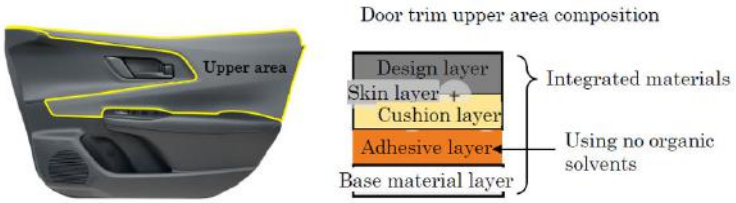
Toyota Boshoku Seats, Interiors in New Prius

INTERIOR NEWS

1TOYOTA AND TOYOTA BOSHOKU IMAGES IN THIS ARTICLE

Toyota Boshoku has developed products including seats and interiors for use on the new Toyota Prius, released this past November.

Newly developed sporty style seats with improved ride comfort performance are an option, beyond the entry-level seats with their simply-styled tapered shoulder sections.
The new seats' frame structure features a 3-cm lower H point than the current model. They have a slim silhouette and overhanging shoulders for a sporty look. The shoulders have a new decoration called 'step line', made of glittering skin. The step line is expressive of a sharp and advanced image as the eye-catching accent.



Eco-friendlier glue without organic solvent is used on the door trim. This upper area, which went to waste previously, can now be recycled—a step toward the circular economy—because of integration the component material with others of door trim by using this glue.
The Prius also includes a cabin air filter produced by Toyota Boshoku.

Ford's Heated Surfaces Save Energy

INTERIOR NEWS

FORD IMAGE

Ford has tested heated mats and door panels in an E-Transit van. The result: heating surfaces can reduce energy consumption in the interior.

As part of the CEVOLVER project (Connected Electric Vehicle Optimized for Life, Value, Efficiency and Range), a battery-electric E-Transit was equipped with heated armrests; floor mats; door panels; sun visors, and a heated steering wheel. The test included various operational profiles in which the vehicle doors were opened and closed hundreds of times. Interior energy consumption was reduced by 13 per cent compared to conventional heating. That means the range of the E-Transit could be increased by about 5 per cent.

Rather than running air past a heating element via the HVAC system, Ford says it's more efficient to heat certain surfaces directly. Their method goes beyond heated seats and steering wheels, to also include the likes of the door panels and floor mats.

The thing is, a conventional climate control system heats the air, so whenever the driver has to open a window or door, the warm air escapes and more energy must be used to reheat the cabin back to a comfortable temperature. Heated surfaces, on the other hand, transfer heat more directly to occupants. The heat doesn't escape as easily when a door or window is opened.

New Interior Features for Bimmer X5, X6

INTERIOR NEWS

BMW IMAGES IN THIS ARTICLE

The redesigned BMW X5 and X6 interior includes a curved display comprising a 12.3” information display behind the steering wheel and a 14.9” control display, both located behind a single glass surface.

The touch control display reduces the number of buttons and provides a cleaner-looking cabin, with the automatic climate system now operated by permanently displayed control graphics.

The new instrument cluster is covered in leatherlike Sensafin to provide a premium feel, while the central air outlets have been designed to be slim and integrated. Sensafin is a vinyl-based material made from the likes polyvinyl chloride (PVC); polyurethane (PU), or polyester microfibers.

Also new is an ambient light bar with LED backlighting, integrated below the trim element in the front passenger area. The X5 or X6 callout has been added to the light bar’s graphic; in the same place appears the **M** logo on the top models. The interior light distribution; brightness, and color can be changed using the iDrive menu, alongside a range of other feature, such as the light bar signaling an incoming call with a dynamic chaser light.

With additional touch-sensitive surfaces, the new center-console control panel includes the iDrive controller; start-stop button; electric parking brake, and settings for optional air suspension and off-road modes. The center console also houses the 'Driving Experience Control' buttons and the vehicle’s updated gear selector.

The standard front sport seats are heated, with lumbar support and electric adjustment for height; seat and back angle and backrest width, including a memory function on the driver’s side. The X6 has additional cushioned knee pads on the sides of the center console.

The optional Comfort Plus Pack includes active seat ventilation; massage functions, and seat heating for the outer rear seats. An optional Heat Comfort Pack consists of a heated steering wheel; front door armrests, and center console. A 'thermo' function also keeps drinks cool or warm in the cupholder.

Both models can be equipped with the Sky Lounge panoramic glass sunroof, with LED light spreading across the glass surfaces to illuminate more than 15,000 graphic patterns. Sixteen speakers and a 415-watt amplifier deliver

audio if the optional Harman Kardon surround sound system is selected, or buyers can get a Bowers & Wilkins Diamond Surround Sound System with 20 speakers and a 1,500-watt amplifier.

Basic assist features include traffic sign recognition; lanekeeping; collision warning, and the revised parking assistant with remote control function via app.

The Design Lounge

Yudo Yuntu EV Has In-Car Karaoke

THE DESIGN LOUNGE

YUDO IMAGES IN THIS ARTICLE

The Yudo Yuntu has been launched on the Chinese market. It is a five-door hatchback 4,035 mm long; 1,736 mm wide, and 1,625 mm tall, with a 248-cm wheelbase. The Yudo Yuntu name means 'Clour Rabbit', a name referring to the Chinese Year of the Rabbit.

Yudo (literally 'cloudiness') is a brand owned by Yudo New Energy Automobile. The company was founded in 2015 and is based in Putian city in Fujian province. Up to now, they've had only one model, the Pi 1 Lite electric minicar. The Yuntu can be had in five different colors, with—as so often with Chinese makers—poetic names and descriptions. The full name of the pink shown here, for example, means "Agglomerated plum blossom fragrance floats to reveal freshness and elegance" (alrighty, then…!).

The infotainment system comes with a 3D digital assistant called 'Mecha Rabbit'. It is shaped like a robot rabbit without any legs. The driver can talk to Mecha Rabbit and order it to do all sorts of things: open or close the windows, turn the volume up or down, or adjust the heater. The operating system, which is OTA-capable is called Amber OS, and runs on a Qualcomm Snapdragon 64-bit Octa-Core processor. In the middle of the console, there is a wireless charging pad big enough for at least two smartphones.

There's an optional Entertainment Set consisting of two karaoke microphones; an extra subwoofer, and a game controller. Also included are apps for karaoke singing and playing various games. Yudo says (translated): “No matter how you sing with the built-in mixing microphone, you can sing impromptu anytime, anywhere".

A Tradeoff
By Athanassios Tubidis

THE DESIGN LOUNGE

COFFEE CORNER
DVN
Interior

VW PASSAT (WIKIMEDIA COMMONS IMAGE)

Center consoles are the physical expression and symbols of participative car interior morphology, shifting product semantics from the narrative of driving to the idea of mobility. Early cars had no center console. Cockpit controls and commands were strictly addressed to the driver, monitoring the engine and the main act of handling the machine. Car interiors are such that you can never talk of any one element alone, thus surrounding components play an important part of each other's roles and definitions. Center consoles appeared in postwar vehicles because everything in car interiors is interrelated, and the story turns out to be somehow self-contradicting yet compelling.

In the late 1950s, a novel idea for driver and passenger seats, aiming to address individual seating arrangement (bucket seats), produced in the long run the opposite effect. Unlike individualism, the mere fact that new space was liberated right in the middle, evolved over decades to the most socially engaging part of the vehicle.

Inpostwar American production cars, bench seats were the norm. In 1958, the Pontiac Bonneville convertible anticipated optional front bucket seats, hardly very bucket-like due to their rather flat cushions, however the trend took over and later erased bench seats. Obviously, a console was not yet part of the equation. What is particularly noticeable about these seats is their narrowness. With the shifter still on the steering column, one could walk through the aisle to the back. During the same year, Ford's Thunderbird pioneered the personal luxury coupe segment with bucket seats and console, and in 1959 Chrysler introduced a short console with a flip-up padded center armrest. In 1960, the Chrysler 300F featured a thin full-length console, extending to the rear bucket seats. And in 1961, the Studebaker Hawk offered front bucket seats and an optional 4-speed with a floor shifter. The 1961 Oldsmobile Starfire convertible seems to have had the first console and floor shift integrated. Thus, the act of driving expanded beyond cockpit and steering column, while floor-mounted-shifting was assigned a new activity zone with its surrounding territory, soon to be conquered by new functions.

Car interiors are complex and can be seen as real estate per square inch of technology. Whatever remains vacant, inactive, or undefined is taken over by another neighboring upcoming trend. Floor consoles killed bench seats or it might be that bench seats gave birth to floor consoles. Whichever way that was, center consoles became the visual extension of a new activity along Y0, affecting even the instrument panel that previously, during bench days, was seen as a purely horizontal element. Today 'center console' refers to the control-bearing surfaces in the center of the front of the vehicle interior. The term is applied to the area that begins in the dashboard and continues beneath it, often merging with the transmission tunnel that runs between the front driver's and passenger's seats in many vehicles. During the MPV hype in early 2000's, the trend was such that entire cockpits had been displaced (e.g., Peugeot 807; Renault Espace, Citroën Picasso) to the center and so, a new cognitive geometry of car interiors made its way to our everyday commuting engaging all passengers into the game of mobility.

From that to Tesla's 12.3" screen, which is essentially the focal point of the IP and eventually of the entire interior, we have gradually enabled functions that concern much more the context (such as communication and entertainment) than the vehicle itself. In other words, we traded off one passenger in the middle of the front row, just so the rest of us could socialize more and better. This is who we are!

News Mobility

Allianz Research: New HMI Needs to Monitor the Driver

NEWS MOBILITY

VOLKSWAGEN IMAGE

Operating the navigation system, selecting music, reading text messages…distracted driving with modern technology is increasingly becoming a danger, according to Allianz Insurance. "The risk of accidents increases by around 50 per cent when operating modern communication, entertainment and comfort technologies," the Allianz Center for Technology says.

The safety researchers surveyed more than 1,200 drivers last summer in Germany. 32 per cent said they read text messages while driving; 26 per cent type text messages while driving. The percentage of young drivers up to age 24 was significantly higher: 40 per cent typed or read electronic messages with a cell phone in hand.

More than half of all respondents operated the navigation system to enter a destination, for example. And study author Joerg Kubitzki says "87 per cent of respondents who have to operate their radio via the on-board computer do so while driving. That increases the risk of accidents by 89 per cent".

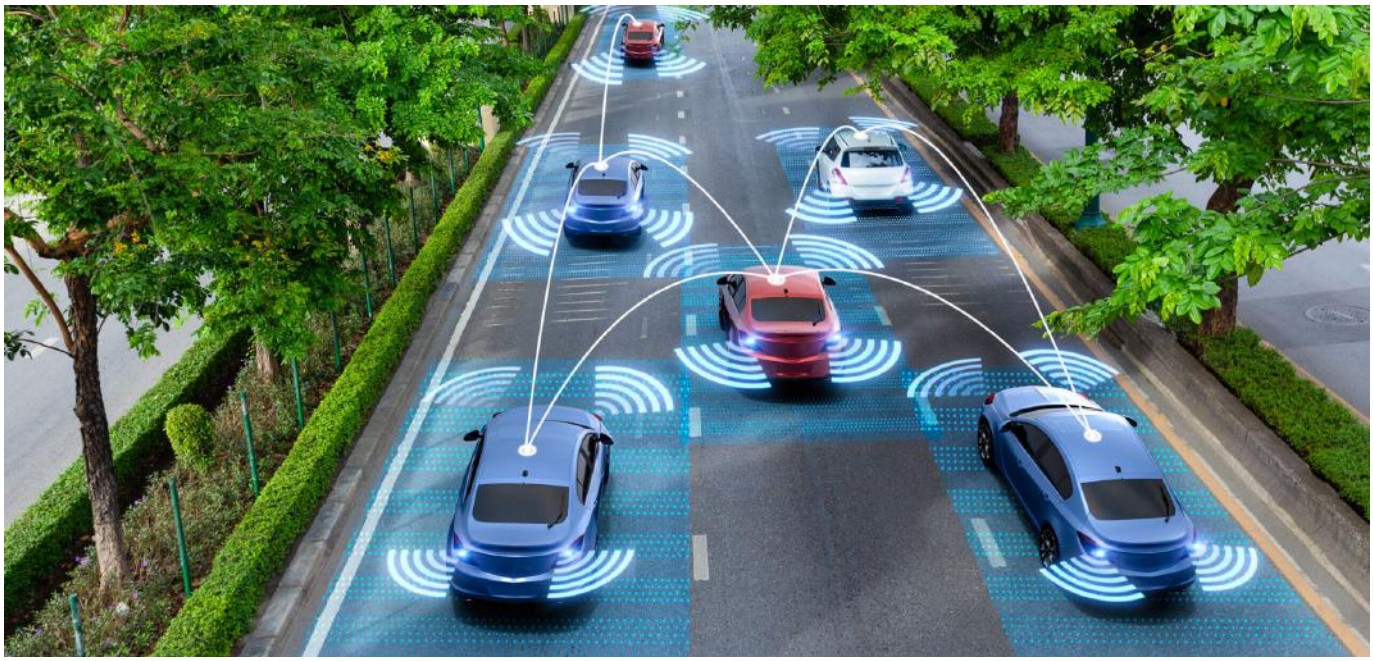
The consequences are fatal; Christoph Lauterwasser, head of the Allianz Center for Technology, says "In 2021, according to the police, there were 117 deaths and more than 8,000 injuries nationwide in accidents in which drivers were distracted. That's five per cent of those killed. However, the number of unreported cases is likely to be much higher." Internationally, the reported percentages are even higher, he said.

"The good old buttons are in the driver's DNA. I can operate those while continuing to look at the road," Kubitzki said. Onboard computer menus, on the other hand, are complex, he said. "There you have to call up a submenu via touchscreen, one step forward, back, and sometimes it gets stuck. I study the display and have to think," Lauterwasser said. In addition, he said, the operating concepts are also very different. "That makes it even harder when changing vehicles or renting a car".

From 2024, the EU will require new vehicle models to support drivers with suitable systems and warn them if they are distracted (DMS). This feedback alone can contribute to a positive change in behavior. And more intuitive HMI won't hurt!

Aiden Hub is First Bidirectional Service Hub

NEWS MOBILITY



AIDEN AUTOMOTIVE IMAGE

Connected services platform Aiden Automotive has been giving details of the Aiden Services Hub, which enables real-time communication and tailored services across vehicle brands, infrastructure and service providers to create a better in-vehicle experience.

To make the idea of connected vehicles a reality, the automotive industry requires a bidirectional connected services network that provides the complete and effective delivery and management of digital services, in addition to communication, revenue and privacy compliance across all parties—automakers, service providers, and drivers. Today's cloud integrations, mobile apps and external onboard diagnostic hardware provide only partial solutions, use anonymous data, and lack scalability and compliance with current privacy regulations.

The Aiden Hub is claimed to be the first bidirectional automotive service hub. The software-only solution streams real-time services across vehicle brands, providing a simple and intuitive experience for automakers; service providers, and drivers. With 100-per-cent GDPR and CCPA compliance, the company’s consent management feature ensures improved, personalized features and experiences while maintaining a high level of privacy protection.

The company uses a single software install that sits on top of a vehicle’s Android Automotive OS (AAOS), standardizing data and communication. This ensures a consistent set of normalized data. The off-the-shelf software takes minutes to install, can be installed over the air, and enables infinite in-vehicle services that provide contextual and tailored user experiences for new and existing cars.

Automakers can dynamically manage services and data through one system instead of having to manage data streams from dozens of different service providers. Additionally, the solution provides car companies with complete access and control over managing, monitoring and monetizing services in real time. Adaptive travel guides are offered using the solution, consisting of virtual guidance with road trips made by experts, which evolve with users’ needs, interests and budgets. This is accessible through all devices, including in-car screens.

General News

Lopec 2023: Everything About Printed Electronics

GENERAL NEWS

DVN IMAGE

Lopec 2023 hosted more exhibitors than ever before: 168 exhibitors from 25 countries and more than 2,300 visitors from 43 countries attended the ICM—that's the International Congress Center Messe Munich—from 28 February to 2 March. The conference highlighted the entire spectrum of flexible, organic and printed electronics, and showed the potential that lies in this key technology. Experts from 22 countries shared their expertise in around 170 presentations. Focus topics of the exhibition and conference were smart living and mobility.

In various conference formats, companies such as BMW; Microsoft; Pirelli; Samsung; Sun Chemical, and Varta presented trends and new applications in printed electronics. Many key players in the industry showcased their products including Coatema; Continental; Covestro; DuPont Teijin Films; Elantas; Fujifilm Dimatix; Henkel; Heraeus; Kroenert, and Panasonic.

The Innovation Showcase presented 3D panels with integrated touch function, display, and illuminated elements from PolyIC and Tactotek. Dynamic surfaces were also a focus of the conference, with a BMW presentation of the new BMW i Vision Dee with versatile color-changing bodywork.

The share of international visitors totaled about 57 per cent, up just barely from last year's 56 per cent. Apart from Germany, the other top 5 exhibitor countries were the USA; France; the United Kingdom, and the Netherlands, and the top 5 visitor countries were France; Austria; the United Kingdom, and Finland.

The next Lopec will take place in Munich on 5-7 March, 2024.

AUTOtech.agil Consortium for Vehicle Architectures

GENERAL NEWS

VOLKSWAGEN IMAGE

Auto-industry companies including the likes of Mercedes-Benz; Bosch; Valeo; Vitesco, and ZF are participating in a joint project for an open software and hardware architecture for vehicles. Under the name "AUTOtech.agil", the associated tools and methods are to be developed in addition to the points mentioned.

The architecture from the previous project, Unicar.agil, will form the basis for this. The existing technology is now to be extended to the entire transportation system. This includes, for example, infrastructure sensors or data processing in a cloud. To demonstrate the added social value of the concepts, the project participants intend to focus on three applications:

- Mobility for people with age- or illness-related performance limitations
- Sustainable transport of critical goods such as medicines
- A 'guardian angel' function for safety of vulnerable road users, such as pedestrians and cyclists

The software architecture is to be modular. Each component can be updated and expanded individually, according to a statement. Connected with standardized interfaces, individual domains or vehicle components, right up to the entire functionality of a mobility system, should be able to be converted to a service-oriented architecture later.

The service-oriented software architecture (Automotive Service-oriented Software Architecture = ASOA) developed in Unicar.agil is being extended beyond the system boundary of the vehicle. In the future, it will be possible to integrate it into industrial platforms such as Autosar Adaptive and ROS 2. Over-the-air updates are also to be possible.

One focus is on neuromorphic hardware and software (machine learning) that can perceive the vehicle environment with unprecedented efficiency. A new and simple development platform including software tools will be created for the electronics architecture. Other components of the project are the Universal Automotive Bus, a modular homologation process for software updates and an infrastructure for secure data exchange (automotive public key).

A monitoring framework is to be created for the autonomous driving functions, which will enable the system to become self-aware and provide a capability assessment at the overall system level.

In addition to 17 chairs from nine universities, twelve companies are participating in the project. These include the software companies IPG Automotive, Vector Informatik and Vires. The research project is being funded by the German Federal Ministry of Education and Research (BMBF) with almost €25m.