Thu, 15 February 2024
Weekly Newsletter

DVN-I
Automotive Interior

NEWSLETTER #199

Editorial

Interior Lighting And Display Tech Talk

FORVIA DISPLAY AT CES 2024 (FORVIA IMAGE)

Last August's **DVN Interior Deep Dive** in San Francisco was themed *Interior Lighting and Beyond*, a title which anticipated the deluge of new ideas coming to shore just half a year later. This week we bring you our interview with DesignLED CEO Stuart Bain; read it, and you'll learn about LED tiles being used as low-resolution displays. It's a great example of the progressive convergence of LEDs and displays, a topic to be kicked around at the upcoming DVN Interior Workshop in Köln on 23-24 April. Don't miss it; **register here**.

We also bring you news of more radical innovation in HMI with eye activation and contactless touch technologies. Sounds like far-flung future fantasy, but both of these are reality now.

This is DVN-I Newsletter № 199, which means that next one will be № 200. We'll have a special edition, summarizing what were what we think as the main takeaways for automotive interior along the five years we've been bringing you the DVN-I News. We enthusiastically welcome your contributions and suggestions, so please speak up: what do **you** think is the most striking automotive interior innovation between 2019 and now? **Send in your thoughts** on the matter, won't you please?

Sincerely yours,

Philippe Aumont
DVN-Interior General Editor

In Depth Interior Technology

Design LED interview - Stuart Bain designLED CEO

STUART BAIN (L, DESIGNLED) WITH PHILIPPE AUMONT (R, DVN). DESIGNLED IMAGES IN THIS ARTICLE.

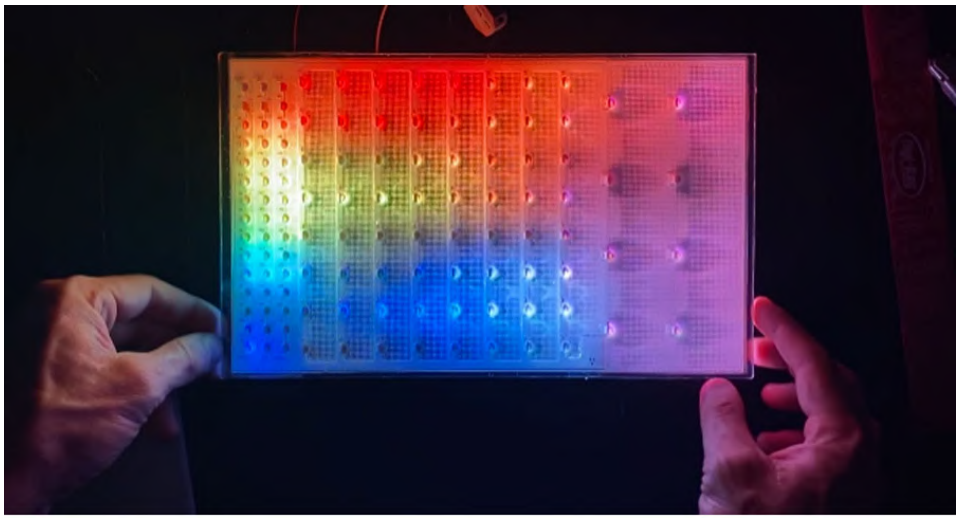
DVN-Interior went to Edinburgh, Scotland, to visit designLED, an innovative LED lighting technology team now part of the Electronics Division of FORVIA, the 7th largest automotive technology supplier in the world. The team excels in the design, development, prototyping, and scaling of thin, flexible LED lighting and HMI products for the automotive industry. We met with Stuart to better understand the company and explore the emotional and functional use of lighting and display.

DVN Interior: We are here in the Alba Innovation Centre, what is it?

designLED: It is an innovation hub, supported by the Scottish Government, which has all the services we need to grow and prosper. Now as part of a global innovations team, designLED occupies around half of this building with a twenty strong team of optical and lighting engineers, innovators, and technology visualization experts (technology can be challenging to communicate simply sometimes so to visualize it physically or virtually is critical).

DVN Interior: Can you tell us more about designLED history?

designLED: Founded by Dr James Gourlay in 2004, designLED developed LED backlights for the LCD TV industry. Here we are talking about homogeneous lighting achieved in a super thin package (light tiles) with individual LED (pixel) addressability, making it perfect for large areas of uniform and dynamic light at low cost. This is becoming increasingly relevant for both the interior and exterior of automobiles.



MULTI DENSITY DYNAMIC LIGHT TILE

DVN Interior: What were the major milestones of your development?

designLED: Several milestones have allowed designLED to grow. In 2011, investments from OSRAM and Siemens helped validate the technology. In 2014, an investment from IKEA through their Greentech fund confirmed its affordability and facilitated high-volume manufacturing in China for sale through their global retail and online stores. *During a presentation to a Japanese automotive supplier in 2019, we were amazed that in an audience of thirty design engineers, two confirmed they already had designLED technology in their homes, an unbelievable feeling as a start-up!*

IKEA CONSUMER LIGHTING PRODUCT STROMLINJE 2017

In 2017, we shifted our focus to the automotive industry, where our first task was to convey our vision for the technology in cars and explain why it would be successful. Renders that were quite visionary at that time are now common-place and becoming a reality in 2024.

DESIGNLED 2017 LIGHTING AND DISPLAY OF THE FUTURE

In 2021, FORVIA acquired designLED. With significant complementarity to another lighting acquisition that year, Hella, FORVIA created a hugely compelling value proposition covering all aspects of interior and exterior illumination and display. The speciality of designLED technology being pixel addressable LED backlighting, supports the growing trend of enhancing user experiences (UX) and HMI with high- and low-resolution lighting and displays within the cabin. *One interesting aspect of the acquisition was that it was conducted online, throughout COVID19 with no 'in person' meetings, quite a feat and a testimony to the creativity and resilience of both teams. Two prevailing strengths of the local and wider organization today.*

DVN Interior: Why did you join FORVIA?

designLED: We joined FORVIA for our shared vision of mobility and to seize an opportunity. Our technology and competitive advantage had excited global OEMs, and we had executed multiple high-impact proof of concept projects. However, we lacked a pathway to serial production and the means, critical mass, brand, and credibility to deliver a volume solution. By joining FORVIA, we gained the credibility and scale to deliver volume, with manufacturing set to commence in Q2 2024 from our facility in Taiwan.

DVN Interior: What does it mean to have a start-up mindset?

designLED: Start-up DNA is the ability to find creative solutions to challenges through resilience, teamwork, agility, and ingenuity. It is about building a high-performance team aligned to a common goal, being disruptive and about having the freedom to do exciting things and take some risks.

DVN Interior: What is your development strategy?

designLED: It is around the exciting concept of interior lighting converging with displays to give a truly immersive, personalized, and over-the-air upgradable UX. We are looking at how we can drive the overall value proposition in the context of sustainability, affordability, and experience. These are the building blocks that will bridge from current to future system level solutions that meet the goal of helping OEMs sell more differentiated vehicles.

DVN Interior: What are the benefits of your Light Tiles?

designLED: It is a compelling UX, pixel addressable lighting and display system with less LEDs, less power, less costs and critically presented in the same thin package irrespective of pixel density.

FORVIA LIGHT TILE FOR TRANSPARENT DOOR

SKYLINE IMMERSIVE DISPLAY

Our technology was recognized at CES 2024. Out of four innovation honors awarded to FORVIA, two were based on designLED expertise: Light Tile for Transparent Door and Skyline Immersive Display (in DVN Interior), demonstrating this convergence of lighting and display.

DR JAMES GOURLAY AND PRODUCT DESIGN AND DEVELOPMENT MANAGER TONY ALLISON PICTURED WITH ONE OF THE FOUR FORVIA CES 24 AWARDS.

DVN Interior: What are the main challenges in front of you?

designLED: Our goal is to create a Sustainable, Perceptual, and Connected UX. We strive to offer world-class sustainability, enhance the journey for both the driver and occupants, and ensure their safety as we move toward the next stages of autonomous driving. We aim to foster a new and secure relationship between the vehicle and its passengers.

DVN Interior: How do you see the future of interior lighting?

designLED: Previously, it was about generating ambiance and task lighting. Now, it is communication, low-res display, synchronization with infotainment, a tool for personalization, light reflecting status, HMI, or a visual manifestation (GUI) of the personification of the car itself - the digital assistant.

Autonomous vehicles will require a flexible interior to adapt to different use cases and pending driving scenarios. Safety and a feeling of confidence will be critical. Embedded light and display, not always visible to avoid cognitive overload, will be at the center of this.

The trend toward more interior lighting is widely accepted, provided it is sustainable and affordable.

DVN Interior: How do you prepare your organization for the future?

designLED: We prepare through the addition of new skills from younger individuals who can complement and enhance the team experience. We recently hired a young Software Defined Vehicle (SDV) engineer and beyond his specialization, his contribution as a representative of a different generation with different expectations provides invaluable insight into what we should innovate at the emerging user level. Also, hardware will need to be matched to software, not the other way around, as was the case before. This is a big part of our innovation roadmap as part of a global team harnessing the full potential of FORVIA.

DVN Interior: AI was a big theme at CES, and now everywhere in the industry, what does it mean for you?

designLED: UX is becoming a strong card for the team here and AI will help us (and users) to generate UX automatically. Deep-learning algorithms will adapt the look and feel of the environment by having an awareness of the context (occupants, outside environment, vehicle status, entertainment, etc.). AI will optimize sensor fusion; and AI will rely on a modern, high performance SDV architecture, making the SDV a must-have.

DVN Interior: What variation do you see in demands from different regions?

designLED: Rate of adoption of technology is faster in China, and more conservative in Europe and North America. Time to market (TTM) is now a key driver for all. European and North American OEMs are having to compete not just on features but the time it takes to get those features on the road to keep pace.

DVN Interior: The industry is focusing increasingly on immersive technology, what does it mean for you?

designLED: On a purely human level, it is the difference between, say, dreading a long, stressful drive in bad weather, to looking forward to the opportunities that journey time and experience can provide. At FORVIA, we pioneer technologies for mobility experiences that matter to people. From a technology perspective, this means more built-in latent capabilities (light/sound/sensing), triggered when needed. By localizing the experience within the zones of the vehicle and integrating functions, we can reduce costs and significantly decrease the infrastructure in and processing power required.

DVN Interior: How would you summarize this conversation?

designLED: It was fun being a start-up, similar to university, in that it prepares you for the real world. The same skills and qualities you hone are just as relevant: creativity, resilience, and teamwork. From a technology perspective, the recurring theme is clear: mass adoption of pixel addressable solutions, and the blurring of the lines between ambient lighting and displays. We are at the start of an exciting convergence of the two topics, and I believe that FORVIA designLED light tiles will be the platform of choice. (DVN Koln; Light and Display – The convergence theory).

All of this seen through the critical lens that whatever technology we innovate, it must matter to the people that buy and use it to enhance their lives.

Interior News

BMW, Change Lanes At a Glance

INTERIOR NEWS

BMW's new Active Lane Change With Eye Activation will be part of BMW's Highway Assistant L^{2+} system. It's getting an update: drivers will be able to initiate a lane change just by looking at a mirror.

Particulars haven't yet been released, so we don't yet know how the system will discern between a driver looking in the mirror with intent to change lanes versus any other reason. BMW typically allows a measure of personalization with their assistive features, so perhaps drivers will be able to adjust the glance-to-change-lanes behavior.

The system will also keep track of owners' driving behavior and suggest, via an app, which electric BMW is best suited to them. BMW says this is intended to "help spark interest among users of ICE vehicles in switching to an EV".

Contactless Touch HMI from Vtouch

INTERIOR NEWS

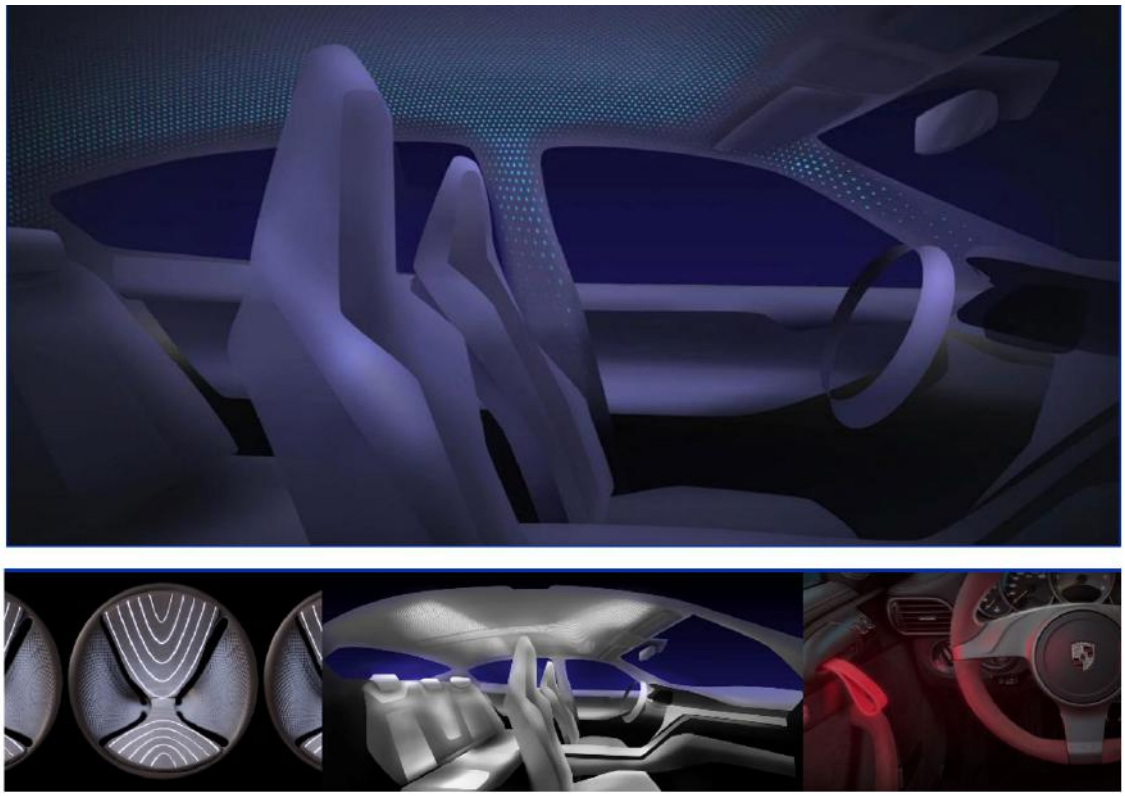
Vtouch, based in Seoul, South Korea, recently presented their SpatialTouch HMI control technology. Thismakes it easy and precise to control in-car functions by simply pointing at them. It offers a truly touch-like interface for a 3D space. The single SpatialTouch system covers everything in the vehicle, such as the display and buttons, as well as the air vents and sunroof. It's a hygienic contactless solution for passengers in the taxi, ride-sharing services, and even personal vehicles; if nobody has to touch the screen, then it won't collect fingerprints.

Vtouch says it's easy and intuitive to use, with no guidance or training required, and drivers don’t need to look away from the road to operate the controls, just glance peripherally.

SpatialTouch analyzes the user's motion with deep learning AI technology, of course, through a 3D camera, allowing to pinpoint where a person is pointing and select that precise point at the same time. Vtouch says the system exhibits near-zero latency thanks to patented prediction algorithms.

Munda's Luminous Fibers Woven Into Fabrics

INTERIOR NEWS



FLT IMAGES

Munda Textile Lichtsysteme, in Erkrath, Germany, was founded by Aunde and Mentor as equal partners in the summer of 2019. The name Munda is said to derive from the two parent companies' names, symbolizing the basic idea behind the JV: two companies with a common objective contributing their key expertise and creating something new. Specifically: textile lighting systems, at the highest technical level and suitable for use in mass production in the most demanding industries.

Aunde's part is the textile expertise. The manufacturer of technical textiles also produces car seats and other interior modules thanks to acquisitions such as Isringhausen, Fehrer and Reinert. With a 2022 turnover of €3.4bn, they are one of the 100 largest suppliers in the world.

Mentor is known in the automotive industry as a specialist for LED-based lighting systems in interiors, for example in armrests, consoles and instrument panels. They are providing the production facility for the first projects.

What interests customers about Munda's offering is the simple and flexible integration of light guides into fabric structures. This is made possible by optical fibers made of PMMA (polymethyl methacrylate—commonly called acrylic), connected to LED modules, and woven into light-conducting fiber mats. The special feature here is that the light emerges from the side of the fiber, which opens up new application possibilities.

The process has two decisive advantages: It requires little installation space and it brings light into interior areas that would otherwise be almost impossible to illuminate. For example, in crash-relevant (and soft) interior components such as headrests, no complex and expensive injection molding tools are required. This makes the process suitable for smaller series or special models.

Textile lighting systems can also take on functional tasks by expanding the display areas in the car and creating new ways of communicating with drivers, passengers and rear-seat passengers. If translucent textiles are used as cover material, 'disappearing' or 'dead-front' effects can be achieved. The decors, symbols or texts created by light are then only visible when the light is switched on; otherwise, only the unlit textile is visible. This has a noticeably more discreet effect than any screen and ensures a clear and unobtrusive interior design when no information needs to be communicated.

Jeep Wagoneer S: Four Screens, Hardly Any Switches

INTERIOR NEWS

STELLANTIS IMAGES

VW, as we've reported, has been bringing switches back into the cockpit. Jeep is headed the other direction, towards a switchless cabin full of touch-sensitive surfaces. There will be hardly any switches in the Wagoneer S electric SUV. Nevertheless, the center console is dominated by a rotary knob for selecting the driving mode, with a terrain selector switch underneath.

The cockpit offers four display areas. The screen behind the steering wheel shows driving-related information, while the central touchscreen serves as a display and user interface for infotainment and vehicle functions.

Below this is another touchscreen for climate control functions. There is a fourth touchscreen on the right-hand side of the dashboard, which the front passenger can use to consume media content. The Wagoneer S largely dispenses with physical switches and buttons.

Another interesting interior feature, one that has become almost mandatory on EVs in the past few years is the ambient lighting stripe that will travel from the doors to the dash, giving the cabin a futuristic look.

Other special features: The model will have a double-pane panoramic sunroof as standard. A premium audio system from Mcintosh with 19 loudspeakers will also be available as an option.

Seeing Machines' AI-Powered Interior Sensing Technology

INTERIOR NEWS

SEEING MACHINES IMAGE

Seeing Machines, a computer vision technology company from Australia (see CEO Interview in DVN) now designs AI-powered operator monitoring systems to improve transportation safety. They showcased their interior sensing technology at Automotive World 2024 in Tokyo, from 24 to 26 January.

The company put up a demonstration vehicle used to display their software and algorithm developments for their driver and occupant monitoring system (DMS/OMS) technology solutions.

To enhance transport safety, Seeing Machines uses machine vision technology to measure and analyze head pose, eyelid movements, and eye gaze, under a spectrum of lighting conditions, including through sunglasses. This data is processed to interpret driver attention state, drowsiness and impairment levels to provide critical inputs in real time to ADAS, vehicle cockpit, as well as comfort and convenience systems.

Seeing Machines also is continuing to expand their occupant monitoring features, including shifting toward higher resolution wide field of view cameras, as automaker and supplier customers look to add new safety and comfort functions.

Xylon's New Customizable AI DMS Tools

INTERIOR NEWS

XYLON IMAGE

Xylon is a provider of IP cores, services, and solutions based on adaptive SoC and FPGA devices. They've now introduced their driver monitoring system (DMS) technology suite, called Artieye, designed as a comprehensive collection of modules to cover AI designer needs, from road data collection and neural networks optimization, all the way to full AI implementations in embedded hardware. The Artieye suite enables users to skip years of development and take full control over their DMS products.

to simplify the task of AI system development, the Artieye suite comprises pre-verified, customizable modules covering various stages of development. It begins with the creation of a remotely tracked test fleet equipped with heterogeneous sensor kits, followed by data acquisition in lab and road environments, and the establishment of AI data sets and bio-medically grounded ground truth sets. The suite integrates different neural networks optimized for detecting driver drowsiness and visual, manual and cognitive distractions.

Artieye provides a comprehensive demo and evaluation platform based on the AMD Zynq UltraScale+ adaptive SoC, enabling real-time implementation of DNN models. For testing, Xylon has developed automated test benches, leveraging the Logirecorder, the company’s hardware-in-the-loop-capable datalogger.

Davor Kovačec, Xylon’s founder and CEO, said: "The solutions that came as a direct result of that experience helped us make Artieye a comprehensive technology suite that speeds up time-to-market and saves on R&D costs by allowing developers to quickly customize and adopt the provided modules for different in-cabin applications".

Ford Enhances Connectivity, Infotainment

INTERIOR NEWS

FORD IMAGE

The new Ford and Lincoln Digital Experience has been launched, addressing the growing demand for seamless connectivity and seeking to extend drivers' digital lives onto the road.

The integrated experience enables customers to access their favorite apps and services from Google and Amazon and is compatible with Apple CarPlay and Android Auto. The digital interface is user-centric, with touchscreen controls and steering wheel buttons for ease of use, and enables a personalized driving experience.

Profiles can be established for individual drivers, for a personalized user experience, including preferred apps, contacts, favorite destinations, and custom seating positions. Furthermore, Google Maps is integrated to simplify navigation with real-time traffic updates, dynamic routes, and points of interest.

The focal point is the 48-inch "immersive panoramic display", initially featured on the 2024 Lincoln Nautilus. Using the highest resolution ever offered by Lincoln, the display provides crucial information, preferred apps and services within the driver's line of sight. The customizable placement of apps on the touchscreen enhances simplicity, with supportive widgets on the right side offering quick access to information such as media, weather and fuel economy details.

Voice control is also employed with Google Assistant as the default, and Alexa Built-In as an alternative for in-vehicle controls and commands. The system facilitates the download of various entertainment apps, enabling streaming music, audiobooks, podcasts and even gaming while parked.

5G wireless technology and the availability to activate a wi-fi hotspot—with the option of a Ford or a Lincoln Premium Connectivity plan—enhances in-vehicle experience.

The Design Lounge

CMF Sampling

THE DESIGN LOUNGE

COFFEE CORNER
DVN
Interior

1934 VOISIN C27 AÉROSPORT (VOISIN IMAGE)

Irregular grains, fabric-like woven textures, cork, stone, earthy touches, warm shades, natural wood, and leather tones, in a color palette that combines timeless elements with contemporary twists, seems to be the environmentally-conscious appeal of the new design era. While it is hard to find a single word to describe a present-day style, sustainability is a prominent term with ever-growing acceptance since the start of the new millennium. Well distinguished from other moments in design history, we could arguably state that sustainability—a fundamental shift in design philosophy—is the aesthetic depiction of the new reduced-environmental-footprint industrial era and the evolving aesthetic portrayal of our moment in time.

Car interiors, instead of overwhelming occupants with technological displays are now focusing on comfort, while rapidly shifting from functional UX spaces to pleasurable environments. How revelatory could this phrase be all along the CMF adventure of automotive interiors, when put side by side next to other equally significant design periods?

The first digital displays and gadgets, LCDs, digital clocks as well as digital sound systems, would populate car interiors during the 1990s. The particular attention given to sound and sound systems was paired with soft and velvety fabrics and leather upholstery on neutral color pallets. Beige, black and grey would complement, or in times dominate, color schemes in the otherwise soundproof interior. Fewer buttons and minimalist approach gained prominence for the benefit of clean and uninterrupted design lines and an overall sense of spaciousness.

1978 CHEVROLET CAPRICE (STREETSIDECLASSICS IMAGE)

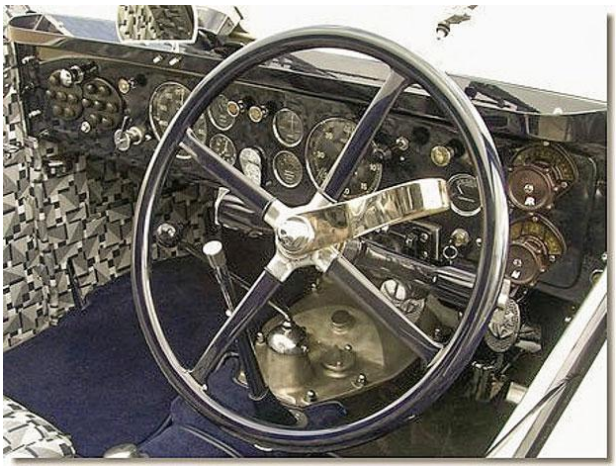
In another memorable moment, the 1970s, metallized plastic and artificial woodgrain finishes, patterns and bold colors—lime green, sky blue, scarlet red—and patterns followed a space-age design trend, extending into plastic and vinyl. Sunroofs became popular, giving the first glimpse of natural ambient light in car interiors.

Two decades earlier, other vibrant colors like turquoise, coral pink, mint green and sunny yellow on seats, dashboards, and door panels crafted an atmosphere of optimism and excitement, a necessary cultural and visual reform and reflection of postwar prosperity, technological advancements, and a desire for modernity. Chrome, two-tone upholstery, streamlined shapes and rocket-inspired details, cabin comfort and luxury; that was the 1950s.

Although curved lines, symmetry and ornate details were present, in the 1920s, car interiors evolved through a technical layout and organization of many elements such as speedometers, fuel gauges and temperature dials gaining their specific place on the instrument cluster in addition to adjustable seats, rear view mirrors and glove compartments. This is the very moment decorative arts enter the cabin and possibly, in CMF terms, how it all began.

The early 20th century is known as an era of visual arts. Geometric and stylized forms painted or constructed with unusually varied materials expressed the art deco style. Futurism's rejection of the past (in favor of the future), was an ever-growing trend with emphasis on dynamism, speed and technology. Its graphic representations are known for the use of vibrant colors. While Cubism used little light within a reduced palette of grays, emerging Orphism brought colors and light, combining bold patterns and intense hues simultaneously. The widely spread trend conquered many industries, abstracting and dematerializing, multiplying and repeating forms and visual elements to capture movement at its best representation of the otherwise fascinating, yet immaterial, idea of speed. The new style spread across many industries and one such channel was the French textiles. Sonia Delaunay and Paul Poiret are two of the pioneers of the sector.

The exotic idea of freedom to move, best embodied at the time by the pioneering aviators and their exotic new world, found rapidly its ground-based twin: the automobile, something equally individualistic and exclusive, but more accessible. The transformation from a purely functional mobility device (like a locomotive's cab full of gauges and levers) happened through a different narrative that brought imagination at the service of automotive interiors.



VOISIN C27 AÉROSPORT (VOISIN IMAGE)

One of the greatest examples is the Voisin C27 Aérosport with its stunning interior trim. The gauges in black are in perfect contrast with the upholstery supplied by Poiret. Unlike just fabrics, anything veneered or upholstered now became a surface of visual expression and aesthetic manifestation, maybe like UX graphics today instead of just screens.

Cross-industry trends combined with the social context is what gave birth in the culture of chromatic, tactile and decorative identity of our products and surroundings. CMF has evolved from a catchphrase to a critical aspect of automotive design, enhancing both form and function within car interiors. We could almost rephrase the introductory statement a hundred years ago: Car interiors, instead of overwhelming occupants with technical elements were focusing on beauty, while shifting from driver-specific clusters to pleasurable environments.

News Mobility

Teledriving: Alternative to Robotaxis?

NEWS MOBILITY

VAY IMAGE

Companies like Germany-based Vay say they can one day reduce the number of cars filling city streets using remote-control drivers. It's called teledriving. Customers request a ride on a mobile app. A team of human operators at Vay then use a combination of cameras, sensors, and AR tech to remotely drive a vehicle to the customer. Once the car arrives, the customer drives it to their destination; fees are based on time spent driving. When the trip is complete, the remote driver resumes control over the vehicle and drives it to a new customer.

Vay launched the first commercial teledriving product in the US last month in parts of Las Vegas, previously allowing for early access test drives. The company is operating their remote-control car service near the city's Arts District and the University of Nevada, about a mile away from the strip. Users who take over the cars from the remote drivers are charged 30¢ per minute while driving, and 3¢ per minute if they park the car to go shopping or pick up groceries.

The remote drivers at Vay operate the vehicles using a simulated driving station that looks like an advanced version of an arcade car game, equipped with a physical steering wheel and pedals. A large screen reproduces the vehicle's real-world surroundings using a combination of sensors and cameras. This is all made possible by 5G wireless networks, which let the vehicles quickly transmit real-time data to the remote operators.

Teledriving could provide riders some more piece of mind knowing a human is still guiding the seemingly driverless vehicle. The jury is still out!

Revenue from Digital Services in the Car

NEWS MOBILITY

MERCEDES-BENZ IMAGE

Additional digital services in the car should be a lucrative business, but not yet. The industry expects to make the most money from autonomous driving.

Drivers expect clear added value if they are to book additional services for a €70,000 car. There is no willingness to pay for standard functions such as seat heating, which even small cars have. BMW got a hard lesson on that point not long ago; people justifiably feel they own the car—including its seat heaters—and ought to be entitled to use it without paying and paying and paying.

In an international comparison, German drivers show a restrained interest in additional digital functions, while Chinese and Indians are much more enthusiastic about the digital. With the exception of the function that displays free parking spaces in the vicinity, the interest of German drivers was at the bottom of the seven regions surveyed. According to the Deloitte Global Automotive Consumer Study, digital repair updates (56 per cent), improved traffic information (58 per cent), and collision warnings (53 per cent) are particularly popular in Germany. In contrast, offers that were not directly linked to the car or over-the-air (OTA) updates were less popular. The majority of respondents see benefits in the shift to SDVs.

Nevertheless, the automotive industry is optimistic about generating new sources of revenue with growing volumes of data, as a recent Deloitte survey shows. At the forefront is autonomous driving, for which at least Tesla buyers have already indicated a high willingness to pay, although the function is not yet available in the desired quality. A high willingness to pay is also expected for intelligent navigation, personalized car functions or intuitive human-machine interactions. The integration of ChatGPT and other chatbots in vehicle software could soon enable intuitive operation. Providers are already recording growing sales with such digital services. For half of those surveyed, these software services account for up to 15 per cent of total sales.

General News

Lear Books Record Sales in '23

GENERAL NEWS

LEAR IMAGE

Lear Corporation has over a century of experience—they even say the first automotive seat ever produced was theirs, and their motto is Making Every Drive Better. With seating & E-systems design and production capabilities; Lear is leveraging their expertise to offer commercially viable technologies for more comfortable, convenient, connected, and safer driving experiences.

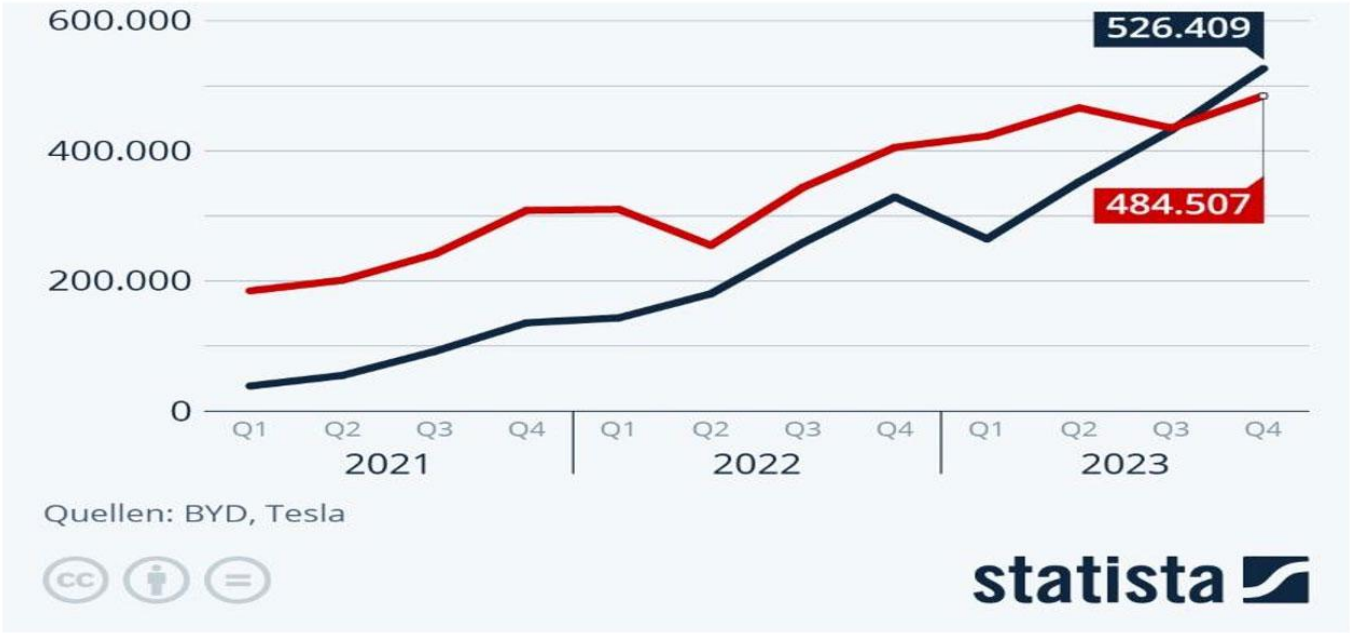
Full-year 2023 sales increased 12 per cent to a record $23.5bn from $20.9bn, with net income of $573m and adjusted net income of $710m compared to $328m and $523m in full-year 2022.

Fourth quarter sales increased 9 per cent to $5.8bn, compared to $5.4bn in Q4 2022.

"Lear delivered record sales and strong earnings growth in 2023, reflecting the execution of our strategy and a recovering industry," said president and CEO Ray Scott. "As we enter 2024, we are expecting another year of increased revenue, earnings and cash flow."

BYD Beats Tesla in EV Sales

GENERAL NEWS



BYD Tesla

According to Statista, BYD sold more than 500,000 BEVs worldwide in the fourth quarter of 2023, exceeding the deliveries Tesla for the first time.

Chinese vehicle production also increased significantly last year. At 3.02 million vehicles in 2023, this was almost twice as high as in the previous year. BYD sells around 90 per cent of their vehicles on the domestic Chinese market, but they also sell in 19 markets in Europe. They plan to launch three new electric passenger cars this year, and they're working on building a first non-Chinese plant in Hungary.

China is the world's largest car market, and the most important market for German makers Volkswagen (including subsidiaries Audi and Porsche), BMW, and Mercedes-Benz. But competition is becoming increasingly fierce, as Chinese makers are giving European and American makers a real fight, especially when it comes to electric cars.