DVN-I
Automotive Interior

Thu, 4 June 2020 Weekly Newsletter **NEWSLETTER #29**

Editorial

Interior: The Price To Pay

The Design Lounge in this edition is presenting how the center console/floor console space has changed paradigm—from buttons and gauges to modern HMI/UX interaction. Now the interior aggregates information, connectivity, communication, and occupant monitoring. Our in-depth piece is focused on how the future will have more car-to-driver communication, as the car will be the "driver" in certain scenarios, with many communication technologies going both ways (with car feedback, through text, images, lights, sounds, vibrations, etc).

Through two different lenses we see that the main, central purpose of the car is no longer to move people, but to communicate and interact while driving. That triggers a permanent flow of new features and technology, in parallel with what's happening with mobile devices and office automation.

This big-bang of new technology is also influencing the €/$ cost balance of the car as a product, and also as a service with millions of new services through apps and permanent connectivity to the world. The business model is shifting, as it shifted to go from a portable telephone to a hold-in-the-hand computer. But the total cost at stake is at least 100 times higher, and nobody knows if what was acceptable at €/$500 cost magnitude will be still possible at €/$50,000.

We hope you enjoy this newsletter—please let us know your thoughts; we value your feedback. And remember, if you've not yet registered for our 1st DVN Interior Workshop in Darmstadt on 23-24 September, you may **do so here.**

Sincerely yours,

Philippe Aumont
General Editor, DVN-Interior

In Depth Interior Technology

Smart HMI for Safety, Health, Wellness

DVN-I has covered IAQ and hygiene in recent editions, and the absolute need of a continuous environment and protection level along everyone's daily lifeline, from home to office, through transportation, shopping, and all the rest.

New levels of health concern amid the pandemic will push the industry to develop more human-centered, health-related features into cars for more demanding customers, and to help automakers bring forth USPs (unique selling propositions) to support a sales recovery and boost profit potential.

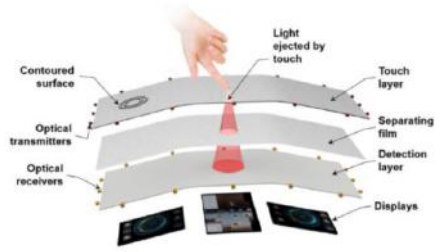
HMI, the human-machine interface, has always been important to secure proper interaction between the driver and car. In traditional driving, the focus was more on how the driver commands and operates the car—a one-way flow of intent and action. With today's assistance systems, communication is in both directionss (with car feedback, through text, images, lights, sounds, vibrations, etc). The future will have more car-to-driver communication, for the car will in certain scenarios be the driver.

A combination of this automated driving advancement and present health concerns, will lead to many more interior innovations in term of HMI, which can achieve both targets, while providing an overall improved safety level.

DMS (Driver Monitoring System) will watch over the driver. DMS is pivotal to improve safety, for will be necessary for easy handoffs between human and autonomous driving required in L^3 vehicles. DMS could also offer many other benefits in managing fatigue, drowsiness, cognitive load, personalization, and keeping track of health and wellbeing.

Contoured displays: Why do traditional buttons and switches fall so easily to hand? Because you can locate them purely by touch. A number of tier-1 suppliers are currently working on shaped touchscreens with features such as ridges and dimples to replicate this ability.

Finnish technology company Canatu has been working with Faurecia on stretchable and 3D formable touch surfaces for automotive interior applications. These use Canatu's proprietary Carbon NanoBud (CNB) material, which is a hybrid of single-wall carbon nanotubes and fullerenes, designed to combine high electrical conductivity, favorable optical qualities and impressive formability.



Source : Uniphy

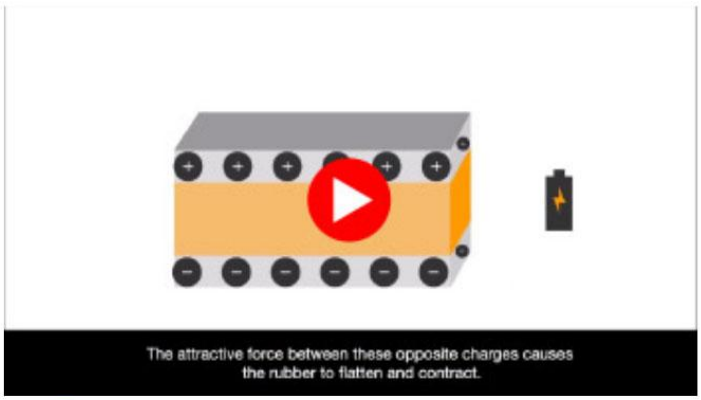
Uniphy's "beyond touch" technology, combines design elegance and flexibility as well as ensuring safe operation by combining latest curved and contoured touch surface technologies, on-display buttons and integrated mechanical control dials.

The driver gets to operate the graphics display without the need for visual interaction.

Haptic feedback: Haptic displays take the sensation of touch one step further by mounting the screen on an actuator. By modulating the force feedback as the user moves their finger over the screen it's possible to create the sensation of bumps, rides and textures on a completely smooth display.

Continental was one of the pioneers of this concept with their Haptic Feedback Display, mounted on a series of electromagnetic actuators.

Bosch soon followed with their NeoSense interface. This monitors the pressure applied to the screen, so the user can gently swipe over the virtual buttons or press harder to activate them. Varying the pressure also allows the user to control other functions, such as the speed at which the system scrolls through its menus.



Toyoda Gosei's **e-Rubber** is a novel rubber material that can function either as an actuator in response to electrical stimuli, or as a sensor in response to mechanical force. Its basic structure is a thin dielectric elastomer film sandwiched between two electrodes. This is a haptic technology that simulates various tactile sensations using these vibrations.

Simplify

Hyundai's Cockpit of The Future aims to clean up the human machine interface (HMI) around the steering wheel. Rather than many physical buttons, two miniature haptic display panels, one within reach of each thumb when your hands are placed on the wheel. “Currently we tend to see around 10 to 20 buttons on the steering wheel depending on the manufacturer,” explains Regina Kaiser, senior HMI engineer at Hyundai Motor Europe Technical Center. “In psychology, people talk about the Magic Number – seven plus or minus two – which is the number of tasks that people can typically hold in their short-term memory. We wanted to reduce the number of buttons on the steering wheel down to that level so they could operate them with muscle memory alone.”

3D Imaging: Challenge here is to improve driver information and reduce distraction. Therefore, use of 3D graphics will develop. It can bring important information to the foreground, while retaining less critical information behind. It enables focus and context, helps to effectively alerts the driver, and improves comprehension and readability.

Aptiv’s (formerly Delphi Automotive) MLD (Multi-Layer Display) technology uses two LCD displays separated by a gap of 6 mm. This creates a seamless perception of depth without the need for special glasses or headtracking cameras.

Visteon has applied a similar principle with their 3D Blade concept, which is used for the instrument cluster on the new Peugeot 208. It features a high-definition 10.25-inch ‘background’ TFT display and a 7-inch ‘foreground’ TFT display that’s projected onto a semi-reflective blade. The leading-edge display creates a 3D projection of approximately 15 mm between the front and rear images.

We've previously covered Marelli's Glass-Free 3D Display technology, where 3D depth perception will take the guesswork out of when and where to turn, by virtually immersing the driver in the surrounding environment.

Variable fonts Monotype (Monotype Imaging Inc.) develops variable font technology which can creates variation on typographic message pending context (alert, light condition, language length). While improving readability, it saves computing capacity as many different variations of a typeface to be incorporated into a single file, rather than having a separate font file for every width, weight, or style.

In the next installment of this series, we’ll review many other HMI developments in other important domains, such as Driver Monitoring System, Voice and Gesture interaction, Mood Monitoring, and more. Overall it shows how these increasingly sophisticated HMI systems can simplify our interactions with our cars, even as the list of available features and capabilities is larger and more diverse than ever, and still growing.

Interior News

Mercedes' New Smart Capacitive Steering Wheel

Most modern driver-assistance systems require drivers to paying attention to the road and to many other screens and controls! Mercedes' new capacitive steering wheel, arriving on the 2021 E-Class sedan, takes the steering wheel out of the equation, as it has capacitive hands-off detection.

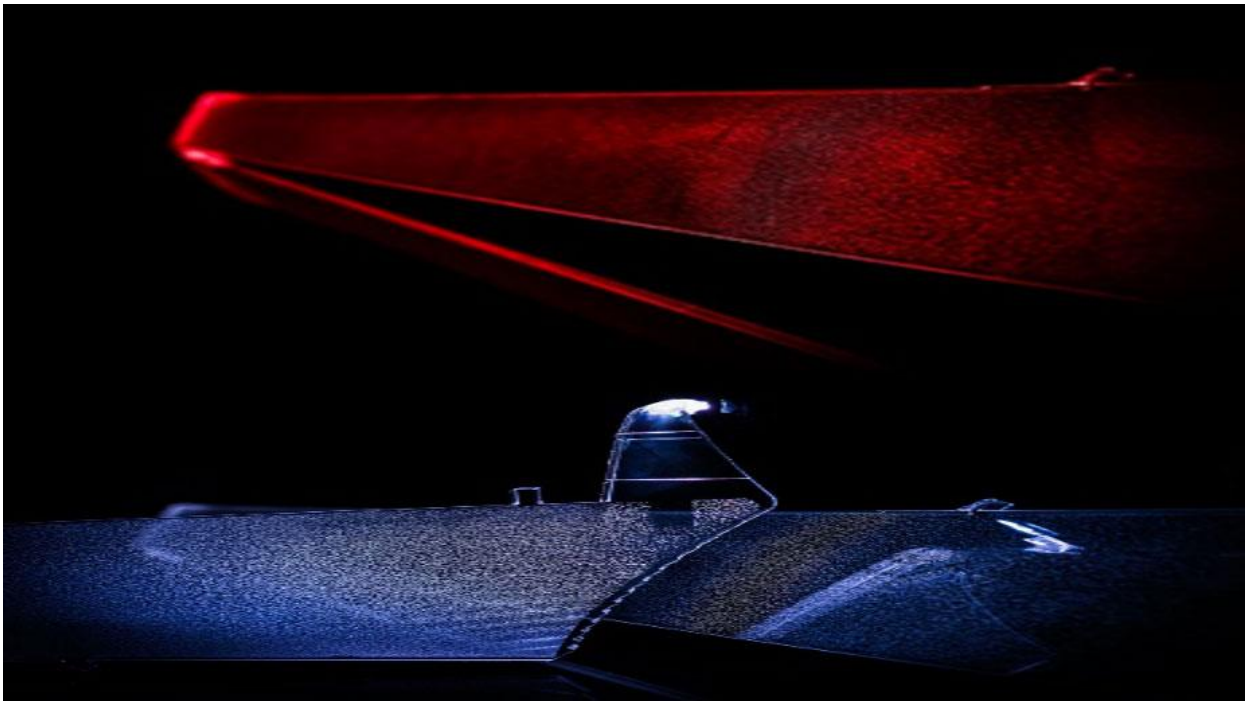
A two-zone sensor mat is located in the rim of the steering wheel. The sensors on the front and back of the rim register whether the steering wheel is being held and signal assistance systems that the vehicle is under control. The touch control buttons integrated into the steering wheel spokes also function capacitively. They allow for smartphone-like swiping gestures which enable drivers to easily adjust the volume or cruise control settings. The buttons also allow for more traditional presses.

According to Mercedes' Creative Director of Interior Design, "Steering wheel design is a world of its own and a very special challenge that is often underestimated." Hans-Peter Wunderlich went on to say "The fingertips feel little things that we normally don't notice. If an unevenness is disturbing or the steering wheel does not fit snugly in our hands, we don't like it. This haptic sensation is sent to the brain as feedback and determines whether or not we like the car."

It has same function as the Hyundai Cockpit presented therebefore in our in-depth, but will be on sales from this fall.

Mercedes has equipped the E-Class with a suite of driver-assistance tech, including a safety system that monitors blind spots even when a vehicle is at a standstill. The system can warn the driver of approaching vehicles, motorcycles or bicycles when opening the door.

3D Light Guide Simulation with Optiback



Weidplas, headquartered in Switzerland, have a new, powerful light simulation program called Optiback, to compute microstructures for 2D- and 3D-shaped light guides with an automatic optimization process for light effects. The result of this light simulation is a light guide with a highly efficient light output with a minimum number of LEDs. The packages of the light guides can be very flat and the light distributions are homogeneous or light patterns on styling demand.

Figure 1: 3D-shaped light guides with one and two low power LEDs for homogeneous backlighting of a vehicle width decorative trim in the instrument panel

Figure 2: The sill plate has an overall height of < 5mm with a slim light guide (height 1.5mm) and 3 million microstructure elements for a uniform illuminated company logo

with low power LEDs (20mA) at one side of the light guide.

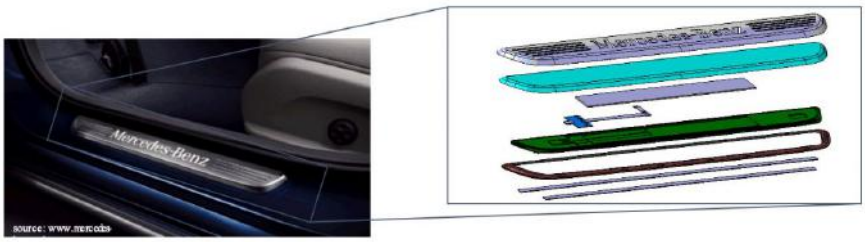
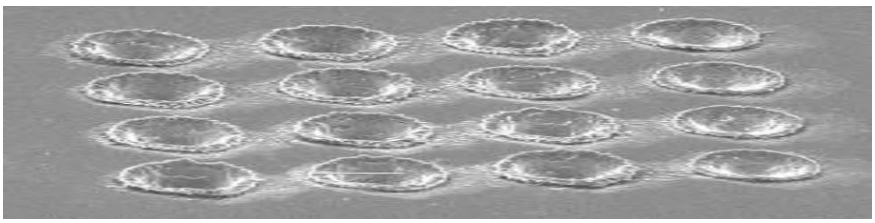


Figure 3: Microstructures with a nearly invisible size of a few µm



The Optiback light simulation software can compute millions of microstructures with a size of only a few µm. The light guides can be very thin (< 1mm feasible), up to a few meters long, produced in an injection molding process in 2D or 3D geometry with hard and soft materials. The structuring is homogeneous or styling driven with tool insert or laser induced, full or focused on the light areas of interest.

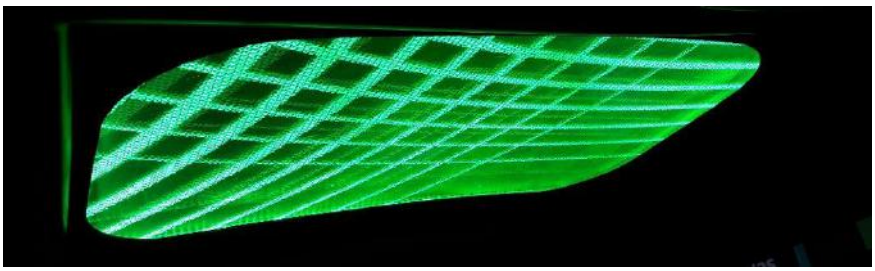
Weidplas Microstructures into the Volume of Light Guides

THREE DIMENSIONAL LETTERS, LASERED INTO THE VOLUME OF A LIGHT GUIDE

Structures for light activation are normally implemented on the surface of the light guides. Weidplas, from Switzerland, has researched and developed a technology to implement the light scattering structures with lasers into the volume of the light guides. With this technology the structures are protected in the volume against outer impacts and you can create three dimensional effects with illuminated objects by lasering the structures in different depths of the light guide.

Combined with nearly invisible microstructures, lasered in the volume of light guides, you can realize amazing lighting applications, which “hidden until lit” effects. Figures 5 and 6 show a window and a panoramic roof, which are transparent in the “light off “mode. In the “light on” mode, you suddenly see illuminated 2d- or 3D structures and light patterns, which are lasered on demand of the stylists.

ILLUMINATED MICROSTRUCTURES IN A WINDOW, WHICH ARE HIDDEN UNTIL LIT



AN ILLUMINATED PANORAMIC ROOF WITH 3D STRUCTURES, ALSO HIDDEN UNTIL LIT

Tougher Tests, New Dummies, DMS Points Coming to EuroNCAP

Every two years, EuroNCAP—the European body that tests vehicle safety—updates and tightens up its test protocols. This year, several important changes come into effect, including 50 km/h frontal impact test evolution, the adoption of a movable deformable barrier, and use a new technologically more advanced test dummy that should be a little closer to reality.

For side impacts, the second leading cause of death or serious injury after frontal impacts, will be analyzed with more severity, thanks to the strengthening of the mass and speed of the ram that strikes the vehicle. As part of this test, the organization will measure, for the first time, the injuries that the driver and front passenger will inflict on each other as well as the effectiveness of the central airbags.

After having already measured the effectiveness of the automatic emergency braking systems (AEB) in different scenarios, the organization will test two new ones at low speed, in reverse (detection of a pedestrian) or when crossing a crossing (detection of a car on the cut axis).

EuroNCAP will also measure the effectiveness of the driver's attention monitoring systems to prevent falling asleep, the leading cause of motorway accidents.

Finally, after having measured the systems that act before and during the accident, EuroNCAP will also focus on the post-accident system, with the help of CTIF, International Association of Fire and Rescue Services. All the elements which make it possible to quickly rescue the occupants will be judged, information communicated to the firefighters to extract the occupants to the advanced functions of the e-call systems.

"The impact of these updates will be significant (on the rating given), said the organization that urges consumers to" be careful when comparing the latest results with the ratings of previous years ".

Ford, Xpeng SUVs Will Self-Sanitize With Heat

XPENG G3

Disinfecting police cars has been of paramount importance during the pandemic, and after the New York Police Department asked Ford for an improved method to sanitize its vehicles, the carmaker has come up with a solution: heating it up.

FORD SUV

The company announced the end of May that its SUVs, which are largely used in the U.S. police force, now have a new software that will burn out germs. The Ford Police Utility, a version of the Ford Explorer SUV, is now kitted out with the new software that raises the heat up to 56°C (133°F) for 15 minutes.

According to the World Health Organization, Heat at 56°C kills the SARS coronavirus at around 10000 units per 15 min (quick reduction).

Ford's SUVs can now automatically heat up as though they were sitting baking in the middle of the desert on a hot Summer's day. So much so that it's enough to kill 99% of germs that may be infectious within the vehicle, including the coronavirus, as per Ford's statement.

XPeng, EV OEM from Guangzhou, China just added the same feature since the COVID-19 outbreak.

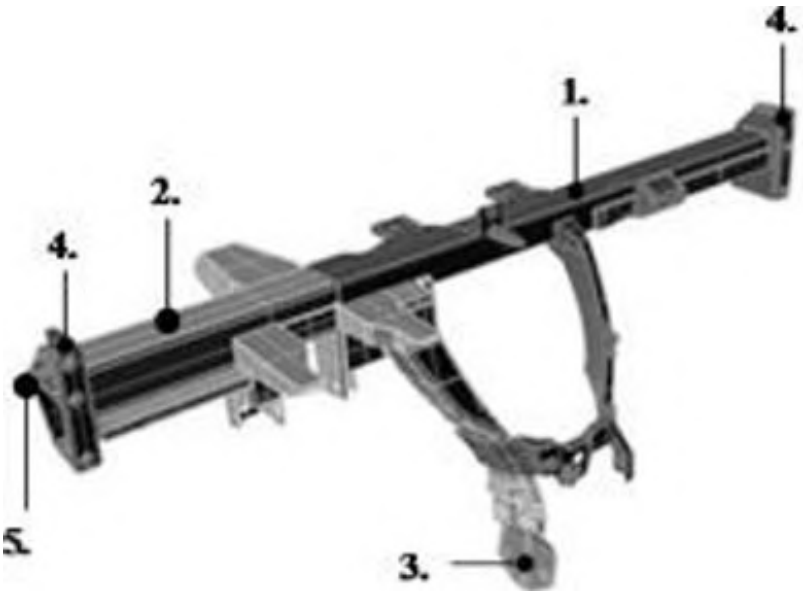
The interior isn't harmed during the process, the only thing that's harmed are those little germs. The entire process is more efficient than using disinfectant spray or wipes throughout the vehicle's interior, as spots and places could be missed.

It sounds like an interesting idea, but will it be good enough? Medical world typically needs more than 99% success rate, more like 99.9999%. And what's the extra fuel consumption look like?

Toray Carbon Fiber For Lower Moldcraft Costs

TORAYCA™ POLYACRYLONITRILE-BASED CF

Toray Industries, Inc., say they have created a high tensile modulus carbon fiber and thermoplastic pellets that are ideal for injection molding; the maker says they can greatly enhance cost performance.



INSTRUMENT PANEL CROSS CAR BEAM

Carbon fiber is a flexible fabric-like material that, when combined with a polymer, can be molded into the shape of a car part that is stronger and lighter than metal parts These carbon fiber-reinforced plastics (CFRPs) are slowly finding their way into new applications as industries demand materials with ever-higher strength-to-weight ratios, corrosion resistance, and workability; mainly body structure, in cars such as BMW 7, i3, i8, Alfa Romeo 4C. But cost has been the limiting factor since ever. Interior application domain could be seat frames, instrument panel cross car beam, door structures, etc.

In the development effort announced recently, Toray tackled the challenge by pursuing further advances with its Torayca MX series control technology to create 7μm fibers

with uniform internal structures. The result is a fiber with a tensile modulus of elasticity of 390 GPa, around 70% higher than the standard level of Torayca series offerings for industrial applications, delivering a much better cost performance.

Torayca thermoplastic pellets incorporating the newly developed carbon fibers maintain longer fibers than conventional high tensile modulus offerings after molding processes. The pellets can thus deliver attain a tensile modulus of 41 GPa. That is comparable to the 45 GPa of magnesium alloys. At the same time pellets have a density of just 1.4, against the 1.8 of magnesium alloy. Using these pellets to make complex parts through injection molding processes would significantly enhance productivity and contribute much to lightening parts.

Citroën C1 Dazzles in Castelbajac's Favorite Colors

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After a colorful E-Mehari Art Car, unveiled in May 2018, and C3 JCC+, all in elegance, available on the market since September 2018, it is now the Citroën C1 model that lends its lines to Jean-Charles de Castelbajac's imagination.

The 5-door C1 JCC+ city car is the perfect blend of style and modernity, which will catch the eye of every city dweller with its cheeky look.

This very special 5-door edition, named C1 JCC+, boasts comfort equipment such as automatic air conditioning and automatic headlamps, and style elements such as the two-tone black roof, wing extenders, and a specially embroidered trim. It offers 6 driving assistance systems useful in urban environments, including the rear-view camera.

The JCC+ logo is embroidered on the head rests of the front seats and on the special front floor mats. A specific color pack enhances the cabin: a scarlet red dashboard; porcelain white trims on the air ducts; and glossy black trim on the touchscreen and gear lever. It includes as well HMI and connectivity features such as 7” touch screen intuitive tablet, extended connectivity thanks to duplicating screens with the smartphone on the tablet, compatible with Android Auto, Apple Carplay™ and Mirror Link®; and a rear view camera with display on the tablet.

Will this new special edition outfit a unique post Covid selling proposition? Future sales will tell us.

News Mobility

The Future of Autonomy Starting with Commercial Trucks

At last week's Autonomous Vehicles On Line Conference, Mike Bucala, Vehicle System Engineer, Daimler Trucks, stated that commercial vehicles are well suited for autonomy, as situations are repetitive and repeatable. For same reasons, accidents are more likely to happen because of prolonged boring driving.

L4 vehicles will improve overall efficiency as there is no shift, break, holiday, sickness, or virus limitation. The driver remains essential for first and last mile operation, and if still present, could concentrate on more productive tasks, route planning, customer service, load/unload planning, fuel optimization.

Ashwani Gupta, Alliance Senior Vice President of the Renault-Nissan LCV Business, said “The revolution in commercial vehicles will come first, then passenger cars will

follow”.

Automation will allow a 24/7 round the clock service, maximizing use of night with much reduced traffic.

Many other application cases could be developed, such as truck platooning (“Road Trains”), Campus, Construction Works, Postal services, Food/Parcel delivery with drone for first/last mile.

Remaining challenges to make it happen at large scale, is on design safety, as liability of an autonomous system belongs to the automaker, and not anymore on the driver.

Coast Autonomous to Focus on Safety, Passenger Experience

Coast is a California-based self driving mobility company, providing AV solutions in low speed environments—campus, cities, airports, and suchlike. At the Autonomous Vehicles On Line Conference, Pierre Lefevre, Coast CTO, presented how they developed their mobility vehicle through a people centric approach, focusing on safety and passenger experience.

They provided transportation services for athletes (12 to 14) to and from the sports venues, during the 2019 Southeast Asian Games, organized in New Clark City, a new city under development located within the Clark Special Economic Zone in Tarlac province, Philippines.

COAST vehicles have mandatory built-in redundancies and is always able to stop safely. COAST vehicles analyze the environment to determine their speed and behavior, thereby providing optimum safety for passengers, pedestrians and other vehicles on the road.

Passenger experience is key, making travel as smooth as possible, with acceleration/deceleration at less than 1.5 m/s^2, keeping balance of standing

passengers. It includes displays for passengers to remain informed about status and progression of the trip.

Low speed is a design choice, it is safer and more cost effective, and responds to the reality that the majority of trips in city centers and on private sites move at less than 30kmh. Each shuttle uses 7 different kinds of sensors, providing data to artificial intelligence machine learning and robotics software. Through sensor data fusion, the vehicle knows perfectly how it operates. Sensor redundancy is making the system safe enough to operate properly.

The Design Lounge

The Center Console/Floor Console Space, Part 4

TESLA MODEL X

Shifter & Entertainment: HVAC, Radio, Navigation to UX/HMI

In this final overview of the floor console/center stack overview, we will look at how and why the UX/HMI/Infotainment has come to define this area.

A bit of background, as usual, is required to understand this. Fundamentally, there has been shift in the usage functionality, not only for vehicle in general but specifically in the zone of the modern automotive interior space.

As overviewed in the last issue of the Design Lounge, the inclusion of the UX/HMI controls and interfaces has made a significant impact on this interior zone. Purposely, screens and displays were omitted from this report as these technologies are the most significant, regarding design impact, thus require a more detailed insight.

Tesla has now established the large format, centrally located touch screen as the modern norm for UX/HMI interaction within the interior environment. How we got here

is primarily a story about connectivity and how society connects and communicated today, not the previous priority of the functional status of the automobile.

The progression of the ‘smart phone’ from the BlackBerry to the iPhone is analogous.

Blackberry Palm Ericsson

NOKIA

The evolution of the smart phone started with devices that were developed to connect to the internet, or more specifically, to get email access. They were not telephones at all but portable email devices. As more features were becoming available, they were integrated into these early ‘smart phones’ but tethered to their desktop/laptop computer operating approaches.

IPHONE

With the introduction of the iPhone, everything changed. Even though the functionally and features were nearly the same as the top tier phones form Nokia (previous imagery), the convergence of these functions with the usability of the large touch screen defined a moment when the phone, was no longer a phone.

It was now, and will forever be, a *mobile device*. This shift has now defined user patterns to the extent that phone calls have a lower priority today. Text messaging (SMS), WhatsApp, Facetime, Google Maps, Waze, etc. are the comms channels of choice.

Since the introduction of the iPhone, every subsequent Apple and competitor model, has been refining their products based on these key functions with a large touch sensitive screen. It's no longer a phone, except in nickname.

The automobile has made a very similar transition. Previously, gauges and warning lights were used so that the driver could get a clue as to the status of the vehicle by interpreting readouts traditional dial gauges and warning lights, or later by using displays. The usage of a display instead of a gauge, wasn’t based on a functional or user need; as technology advanced it became less expensive and easier to route all information readouts through a display.

1971 LAMBORGHINI COUNTACH LP500 SHOW PROPERTY

The diagnostic display (on the A pillar with warning lamps over the Lamborghini layout) shown on the 1971 Lamborghini Countach LP500 show property was used to show failures within the vehicle operation.

1986 VECTOR W8

The 1986 Vector W8 used a diagnostic display lifted directly from the aviation industry to also identify problems with the vehicles function.

1983 OLDSMOBILE TORONADO

Also, in the 1980's General Motors, as shown in this 1983 Oldsmobile Toronado, developed a digital display for both the cluster and center console that included audio equalization functions within their screens. And yes, also steering wheel controls too.

BUICK RIVIERA

This technology from General Motors was also used on the Buick Riviera and Reatta throughout the 1980's.

BUICK REATTA

Even though the mainstream use of digital screens began in the 1980's, it wasn't until the addition of GPS navigation (a new functionality), that the impact was going to be sustained.

1991 MAZDA COSMO WITHOUT GPS NAVIGATION

1991 was a milestone as the Eunos (Mazda) Cosmo was the first production vehicle to offer a GPS navigation feature. You can easily see the impact on the floor console/center stack area on the cars with and without the options

1991 MAZDA COSMO WITH GPS NAVIGATION

1991 EUNOS COSMO WITH GPS. NOT A TOUCH SCREEN BUT WITH A CASSETTE PLAYER!

This quickly became the standard solution for automaker. To have a standard variation control area with small LCD information screens, as seen in the 1993 Lexus, and the optional GPS version.

1991 LEXUS COUPE

Although some OEM's also used rudimentary touch screen technology, speed and user friendliness was not developed enough for a smooth user interaction. Remember the GPS used CD's for their regional map data.

BMW IDRIVE GEN 1

With BMW's introduction of the iDrive system, and its subsequent evolution, we now have entered the modern area of UX/HMI design and its functional requirements.

LAND ROVER

Land Rover with touch screen integrated UX/HMI including an e-parking brake and shifter.

The introduction of Teslas' large format center touch screen made the same impact and convergence of technology as Apple's original iPhone had on the smartphone industry.

TESLA MODEL 3

Today's UX/HMI screens have followed the smartphone industries example of a large, centrally located, tablet-style, touch-sensitive screen that enables today's connectivity priorities.

FORD MUSTANG MACH E

2020 LINCOLN NAVIGATOR

2020 RENAULT ZOE

2020 VOLKSWAGEN ID 3

2020 RIVIAN R1T

Integration into the instrument panel, as seen with Chevrolet and Volvo, is also a technique used to differentiate the brand character by various automakers.

2020 VOLVO XC 90

2020 CHEVROLET SIERRA

A contrasting, or more traditional design integration technique, is also being used by Audi and Porsche that increases the number of touch screens within the vehicle

(eliminating the various buttons) while visually tying-in the gloss black surfaces to the overall interior design theme.

2020 AUDI Q7

2020 PORSCHE TAYCAN

Lastly, the expansion of the large-format center screen to include the cluster, or eventually the entire width of the interior, has now established that the UX/HMI interface has a higher priority than the traditional dial gauge/warning light vehicle information that was the norm since the inception of the automobile.

2020 MERCEDES GLE

2020 BYTON M-BYTE

What the future direction may hold is an unresolved question. Will the designs follow the smartphone lead with foldable technology? Or the minimalist approach that uses the smartphone as a display?

2000 JOHNSON CONTROLS KION - CONCEPT

2019 AUDI AI:TRAIL

Or will the complete windshield become a display and interface as shown in last year's Tokyo motor show by Mitsubishi?

2019 MITSUBISHI MI:TECH – CONCEPT

Either way, the UX/HMI functionality driven by the prioritization of connectivity within the vehicle will spawn new solutions and aesthetics within the interior environment.

General News

France Centers EVs in Car Biz Rescue Plan

French President Emmanuel Macron has announced an €8bn plan to revive the country's auto industry when exiting the COVID-19 pandemic. Increasing production and sales of electric vehicles is central to the plan.

Auto sales in France fell by about 90% in April compared to a year earlier. To rescue the country's ailing auto industry, Macron said that he wants France to become the leading producer of clean cars in Europe. France will face fierce competition from Germany for that leadership role.

Macron announced that France would increase consumer incentives to buy an electric car to €7,000 from €6,000. The aid is also expected to include incentives for people to scrap their old vehicles and buy a lower-emission model.

Macron also tweeted that support for Peugeot-Citroen and Renault, as well as parts suppliers, will increase "massively." Macron visited a Valeo plant in northern France, which makes parts for electric cars, to detail the full rescue plan. France's auto industry employs about 400,000 people in the country.

To consolidate production in France, €1.5bn in grants and equity, will support modernization of production chains, Industry 4.0, robotization, digitization or ecological innovation. It includes €200m in subsidies from 2020 to support suppliers in their transformations and their move upmarket. The second part will be endowed with €600m in equity to encourage development and consolidations of industry players. The third component of €150m will support R&D and innovation to make France one of the most advanced countries in clean vehicle technologies, by continuing to work on batteries, on their recycling but also on hydrogen.

The €8 billion does not include a €5bn government loan guarantee under discussion for struggling Renault, or the millions the government has already spent on temporary

unemployment payments to auto workers.

Dyson Unveils why EV Project Was Canceled

British inventor and entrepreneur James Dyson said he killed off his electric car project after it became clear he would have to charge over £150,000 (€166,600) for the vehicle to make a profit on it.

The billionaire businessman said in 2017 that he planned to develop and sell an EV by 2021, creating anticipation that he might shake up the car industry the same way as he had disrupted the household appliance market with his bagless vacuum cleaner.

Dyson canceled the car last October, saying the project was being scrapped because it was not commercially viable, not because of any failures in research and development.

In his first public comments since the cancelation, Dyson told the Sunday Times that the project cost him £500m of his own money. "There's huge sadness and disappointment. Ours is a life of risk and of failure. We try things and they fail," he said in an interview published on Sunday.

Dyson had hired talent from across the industry for the project, including former BMW and Infiniti executive Roland Krueger. He planned to invest £2.5b to develop the car and build it in a new factory in Singapore.

The Sunday Times interview included a profile picture of a 7-seater SUV minimalist interior. The interior of the car highlights Dyson's interest in improving car seats, which in his model are ribbed with a focus on side-support. "I hate those armchair-style seats you sink into," Dyson said of conventional car seats.

Much of the dashboard information in the Dyson model would have been displayed as a hologram, possibly a version of the traditional head-up display.

Dyson also did not rule out building another car. "I would not say no, but the commercial circumstances would have to be to right. The garage door never closes," he said. Many of the 500 people employed to develop the car have been found jobs elsewhere in the company, Dyson said.

Schneider is Faurecia's Partner Pick For CO2 Efforts

Faurecia has selected Schneider Electric as a preferred partner to support the Group in its commitment to reach CO_2 neutrality for scopes 1 and 2 by 2025. Schneider Electric, specialists in digital transformation of energy management and automation, will accompany Faurecia in this first stage of their CO_2-neutral mission which involves decarbonizing its operations.

"Faurecia's CO_2-neutral objective is both an embodiment of our Convictions for making a positive contribution to society and the planet, and a strategic business decision to bolster resilience," said Patrick Koller, CEO of Faurecia. "Through our CO_2-neutral initiative, we aim not only to lessen our environmental impact but also to create long-term value across our supply chain for suppliers, partners, customers, and end users alike. Partnering with Schneider Electric will allow us to advance rapidly in this first stage of our initiative leveraging their global footprint and technology to deploy solutions across all our sites."

A significant part of greenhouse gas emissions in Faurecia's operations are direct emissions from controlled facilities and indirect emissions from energy procured (scopes 1 and 2 respectively). The first stage of the program will include both purchasing energy produced with low-carbon fuels or from renewable sources, and reducing energy used by adopting innovative digital solutions for efficiency and heat recovery in all of Faurecia's 300 locations around the world.