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Bulletin – Jan 2021

Human Machine Interface

The Automotive Paradigm Shift On Displays in industry developments and at CES 2021

What's inside ?

- Major developments in Human Machine Interface in January 2021



Spotlight:

The Automotive Paradigm Shift On Display At CES 2021



FutureBridge

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Spotlight:

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Key Takeaways

- Cerence seems to be strengthening its hold over the Asia region by collaborating with players from this region
- The integration of the Alexa voice experience is a part of FCA's broader investment in developing current and future services for the connected car

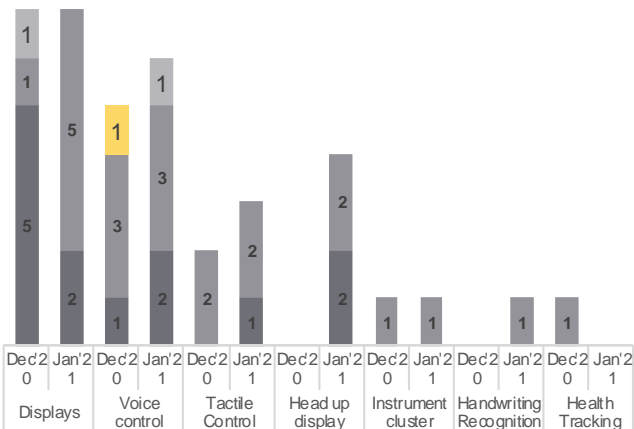
With players pursuing innovations such as these, we expect the automotive contactless payment movement will be compelled to pick up steam

- Automakers are striving to eliminate distracted driving and thus, presenting critical information to the driver in intuitive ways without distraction and providing alerts and warnings that jump out of the display will be responded to with more urgency

- The increasing acceptance of semi-autonomous and autonomous vehicle technology may require reconfigurable instrument clusters. It may further increase the development in the digital instrument cluster

Comparative analysis of activities – December vs January

Voice control and display solutions dominated developments in January 2021



	Dec '20	Jan '21	Dec '20	Jan '21	Dec '20	Jan '21	Dec '20	Jan '21	Dec '20	Jan '21	Dec '20	Jan '21	Dec '20	Jan '21
	Displays		Voice control		Tactile Control		Head up display		Instrument cluster		Handwriting Recognition		Health Tracking	
Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Investments/Funding	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Product Launch	1	0	0	1	0	0	0	0	0	0	0	0	0	0
Collaboration	1	5	3	3	2	2	0	2	1	1	0	1	1	0
Technology Development	5	2	1	2	0	1	0	2	0	0	0	0	0	0

KEY TAKEAWAYS

- Collaborative models among technology developers was the key trend observed in January 2021.
- Traction was also observed for the display technology development with players displaying their solutions at CES 2021
- Deployment of instrument clusters seemed prominent this month also with collaboration of Nuvoton and Green Hills to deliver digital instrument cluster

Technology	Development type	Date	Title	URL
Displays	Collaboration	3-Jan-20	WayRay collaborated with Covestro to develop full colour holographic AR Display	Link
	Collaboration	19-Jan-20	Changan Automobile, BOE join hands to develop smart auto cockpit display	Link
	Technology Development	7-Jan-20	Mercedes-Benz unveils MBUX Hyperscreen featuring 56-inch curved display	Link
	Collaboration	12-Jan-20	Continental, HERE and Leia Inc are partnering to bring three-dimensional navigation into display solutions for vehicle cockpits	Link
	Collaboration	10-Jan-20	Envisics partners with Panasonic to provide a better in-car experience with holographic technology	Link
	Collaboration	22-Jan-20	Xpeng to integrate Amap's third-generation in-car navigation system	Link
Head-up displays	Technology Development	7-Jan-20	Cadillac looks beyond automotive industry to develop next-generation user experience	Link
	Technology Development	11-Jan-20	CES 2021: Panasonic develops new augmented reality HUD	Link
	Collaboration	19-Jan-20	Panasonic's large-screen HUD incorporated in the Nissan Rogue	Link
	Collaboration	19-Jan-20	Nippon Seiki partners with Elektrobit for HUD in Porsche Taycan	Link
	Technology Development	19-Jan-20	CES 2021: Raythink showcases wide-angle spatial imaging AR HUD system	Link
Voice Control	Collaboration	21-Jan-20	Toyota Motor Corporation Signs on as First User of Cerence's New Cloud Service Center in Japan	Link
	Collaboration	14-Jan-20	Cerence and Xevo to Deliver Cerence Pay's Conversational AI-Powered, Contactless Payment Capabilities into Vehicles via the Xevo Market Platform	Link
	Product Launch	19-Jan-20	Cerence Launches Cerence Cloud Services; Brings Drivers' Digital Lives into Their Cars	Link
	Product Launch	19-Jan-20	Cerence Introduces Cerence Mobility Platforms; Delivers Voice and AI Experiences to New Areas of Mobility	Link
	Technology Development	19-Jan-20	Sensory announces the official release of VoiceHub	Link
Tactile Control	Collaboration	15-Jan-20	FCA to implement Amazon's new Alexa Custom Assistant	Link
	Collaboration	14-Jan-20	Phiaro Corporation Incorporates TactoTek IMSE Smart Surfaces into Customer Projects	Link
	Collaboration	12-Jan-20	Research Frontiers' spd-smartglass technology debuts at ces in cadillac celestiq electric vehicle	Link
Instrument Cluster	Technology Development	12-Jan-20	UltraSense Systems releases TouchPoint sensors seamless touch HMI at CES 2021	Link
	Collaboration	20-Jan-20	Nuvoton Technology Corporation Japan and Green Hills Software Deliver Safe and Secure Digital Automotive Instrument Clusters	Link
Handwriting recognition	Collaboration	5-Jan-20	MyScript and EPICNPOC announce their collaboration, leveraging handwriting input to develop a new generation of human-machine interfaces	Link

01

Major
developments in
Human Machine
Interface

Major Developments



TOYOTA



FIAT CHRYSLER AUTOMOBILES

Green Hills
SOFTWARE

cerence



Continental



cerence



amazon

NUVOTON



Xevo



here

Leia Inc.

Key Takeaways

- Cerence seems to be strengthening its hold over the Asia region by collaborating with players from this region
- The integration of the Alexa voice experience is a part of FCA's broader investment in developing current and future services for the connected car
- Nuvoton Technology and Green Hills deliver digital automotive Instrument Clusters. We believe, the increasing acceptance of semi-autonomous and autonomous vehicle technology may require reconfigurable instrument clusters. It may further increase the development in the digital instrument cluster
- Cerence collaborated with Xevo for contactless payment and with players pursuing innovations such as these, we expect the automotive contactless payment movement will be compelled to pick up steam
- The Collaboration of Continental, Leia and HERE will facilitate the elimination of distracted driving and thus, presenting critical information to the driver in intuitive ways

Toyota Motor Corporation Signs on as First User of Cerence's New Cloud Service Center in Japan

Cerence seems to be strengthening its hold over the Asia region by collaborating with players from this region



Parameters	FutureBridge Analysis
Type of announcement	Collaboration Commercialized
Disruptiveness	High: OEMs increased deployment of voice control technology in vehicles
Timeframe	2021
Technology Focus	Voice Control

Analyst Comment

- Toyota began leveraging the service in 2014 for cloud-based speech recognition technology for the Agent function of Toyota's Connected Services. Agent is an interactive voice service that allows driver to search and set destinations, check the weather, and search for other information
- Cerence seems to be strengthening its hold over the Asia region with recently with Beijing Electric Vehicle selecting Cerence for an Intelligent Voice Assistant. Also, in March 2020, Geely and Cerence **announced** that Geely's China Euro Vehicle Technology (CEVT) subsidiary will utilize Cerence's new Cerence ARK platform to build AI voice assistants for Geely motor vehicles. The AI reference kit was developed specifically for the Chinese market
- The other players in voice technology like Amazon and Google, are also becoming highly competitive. Amazon is focusing on expanding services like paying for gas at Exxon and Mobil gas stations. It has also **announced** that Alexa will have emotional intelligence integration. Google has recently **signed** a deal with Groupe PSA that will integrate its Android Automotive operating system into European car brands like Citroën, Peugeot, and Vauxhall starting in 2023. SoundHound **announced** its strategic partnership with Honda with the integration of its Houndify voice AI platform into the new Honda e electric car in Europe

21-Jan-2021 Read this story >>>

- Cerence announced that it has installed a new cloud service center in Japan, with Toyota Motor Corporation (TMC) signing on as its first user
- The new cloud center provides AI-powered innovation, products and technologies such as speech recognition, text-to-speech, and natural language understanding
- With this new facility, Cerence delivers even faster response times, enabling a smoother experience for automakers and mobility OEMs that have deployed Cerence's AI products in Japan

FCA to implement Amazon's new Alexa Custom Assistant

The integration of the Alexa voice experience is a part of FCA's broader investment in developing current and future services for the connected car



Parameters	FutureBridge Analysis
Type of announcement	Collaboration Commercialized
Disruptiveness	High: OEMs increased deployment of voice control technology in vehicles
Timeframe	2021 model year
Technology Focus	Voice Control



Analyst Comment

- The integration of the Alexa voice experience is a part of FCA's broader investment in developing current and future services for the connected car
- The vehicle uses Cerence's conversational AI, which provides access to Amazon Alexa with features like navigation, developed in partnership with TomTom; media and entertainment; phone and messaging; temperature controls
- Amazon is focusing on expanding services like paying for gas at Exxon and Mobil gas stations. It has also announced that Alexa will have emotional intelligence integration. On the other hand, players in voice technology like Soundhound and Google are also becoming highly competitive, especially in Europe
- Google recently signed a deal with Groupe PSA which, will integrate its Android Automotive operating system into European car brands like Citroën, Peugeot, and Vauxhall starting in 2023
- SoundHound announced its strategic partnership with Honda by integrating its Houndify voice AI platform into the new Honda electric car in Europe

15-Jan-2021

Read this story >>>

- FCA claims that it will be the first automaker to implement Amazon's Alexa Custom Assistant into its vehicles, making it fast and easy to create intelligent voice experiences for FCA products. The Alexa Custom Assistant solution is built directly on the Alexa technology stack within FCA's Uconnect system and can be tailored to each FCA brand personality and customer need with a unique wake word, voice, skills and capabilities. This innovative technology also introduces the unique capability of two in-vehicle voice assistants to simultaneously cooperate and fulfill customer requests. This allows the FCA intelligent assistant to act as the product specialist with features and capabilities specific to the vehicle, while Alexa helps the customer with weather, smart home control, music and more

Nuvoton Technology and Green Hills deliver digital automotive Instrument Clusters

The increasing acceptance of semi-autonomous and autonomous vehicle technology may require reconfigurable instrument clusters. It may further increase the development in the digital instrument cluster



Parameters	FutureBridge Analysis
Type of Development	Collaboration Commercialized
Disruptiveness	Medium: Instrument clusters are becoming digitized and multifunctional
Timeframe	Near Future
Technology Focus	Instrument cluster



Analyst Comment

- The Gerda family of SoCs, when paired with Green Hills Software and its INTEGRITY RTOS, meets emerging automotive safety and cybersecurity requirements while still offering flexible solutions for digital automotive instrument clusters, heads-up displays, and e-mirrors
- Digital instrument clusters feature a human-machine interface with improvised graphics. It may require a bigger screen panel as they constitute a higher number of electronic features such as speed, map and navigation, communication, media-on-demand updates, system alerts, and other driving information features. Since the trend in digital instrument clusters is to add more electronic content, the size of these clusters will increase to accommodate all the desired information
- The increasing acceptance of semi-autonomous and autonomous vehicle technology may require reconfigurable instrument clusters. It may further increase the development in the digital instrument cluster
- However, the progress of digital instrument clusters will be noticeable while players are adopting a central big-screen display that covers the dashboard area
- The user experience is becoming the key product differentiator for vehicle manufacturers and buying decision by consumers are influenced by UX

20-Jan-2021

Read this story >>>

- Nuvoton Technology and Green Hills Software announced the immediate availability of Green Hills Software's INTEGRITY® real-time operating system solution for the Nuvoton Gerda® family of automotive SoCs (system-on-chips). The combined solution is a cost-optimized platform for OEMs and Tier 1s to build safe and secure, high-performance instrument clusters, heads-up displays, and e-mirrors
- Good functional safety begins with unassailable security, and with the approaching UNECE WP.29 cybersecurity management system requirements, Green Hills Software is uniquely positioned to provide the best-in-class solution for both ISO 26262 automotive functional safety and ISO/SAE 21434 automotive cybersecurity with its INTEGRITY RTOS and development tools

Cerence and Xevo to deliver Cerence Pay's Conversational AI-Powered, contactless payment capabilities into vehicles via the Xevo market platform

With players pursuing innovations such as these, we expect the automotive contactless payment movement will be compelled to pick up steam



14-Jan-2021

Read this story >>>

- Cerence announced that they have formed a strategic collaboration to deliver Cerence Pay conversational AI-powered contactless payment capabilities into vehicles via the Xevo Market commerce and services platform
- Xevo Market, already live in millions of connected vehicles on the road today, enables ordering, completing transactions, and taking advantage of services with popular brands via the in-vehicle touchscreen – and now via voice with Cerence Pay – while on the go

Parameters	FutureBridge Analysis
Type of Development	Collaboration Prototype
Disruptiveness	High: COVID-19 accelerating the development
Timeframe	Near Future
Technology Focus	Voice Control



Analyst Comment

- Mastercard global transaction data and consumer research poll conducted across 19 countries indicate that contactless card payments, as a proportion of all face-to-face card payments, grew by 25 percent compared to the previous year
- Citing safety and cleanliness, 79 percent of people worldwide and 91 percent in the Asia Pacific say they are now using tap-and-go payments
- Also, according to Visa, more than 70% of all Visa transactions in Europe are made by contactless cards or mobile devices
- COVID is thus going to accelerate the contactless method of payment inside the automotive as well
- Previously OEMs like GM, Jaguar Land Rover have announced the use of in-car payments. Audi using voice and facial biometrics as an authentication makes it contactless and gives an edge over others which, needs users to pay by selections on vehicle touchscreen
- Touchless payments not only provide convenience to the driver but also create process competence and provide data that can be used to make more informed decisions. With players pursuing innovations such as these, we expect the automotive contactless payment movement will be compelled to pick up steam

Continental, HERE and Leia are partnering to bring 3D navigation into display solutions for vehicle cockpits

Automakers are striving to eliminate distracted driving and thus, presenting critical information to the driver in intuitive ways without distraction and providing alerts and warnings that jump out of the display will be responded to with more urgency



12-Jan-2021

Read this story >>

- By this, the companies are jointly providing an important component for a safe and intuitive in-vehicle user experience
- HERE's 3D depiction of buildings and topography are displayed with Leia's Lightfield technology
- The joint solution allows for the visualisation of 3D maps without the need for adaptive eyewear or an eye-tracking sensor
- Lightfield technology even makes the 3D effect visible from various angles. Thus, drivers and passengers alike can see 3D graphics

Parameters	FutureBridge Analysis
Type of Development	Collaboration Prototype
Disruptiveness	High: can be accelerated due to automakers need to eliminate driver distraction
Timeframe	Near Future
Technology Focus	Displays



Analyst Comment

- The 3D-image produced by the Lightfield display is made up of eight perspectives of the same object that subtly vary according to the point-of-view. The light conductors with a diffraction grating and nanostructures create precise diffraction of light under the display panel – thus creating a natural 3D-effect
- Automakers are striving to eliminate distracted driving and thus, presenting critical information to the driver in intuitive ways without distraction and providing alerts and warnings that jump out of the display will be responded to with more urgency. The information presented in 3D should be carefully considered so that it does not increase driver distraction
- The parking cameras can present even more accurate 3D views to the driver to get a sense of the space they're working with, and during navigation, guidance can offer 3D representations accurately. The prolonged usage of stereoscopy or auto-stereoscopy-based designs, induce visual motion sickness or other visual disturbances. The solution for this is to adapt holography or lightfield technology into the devices. This, however, requires additional optics that would increase the size, weight, and cost of these devices

02

Spotlight of the month

> The Automotive Paradigm Shift On Display At CES 2021



SPOTLIGHT

The Automotive Paradigm Shift On Display At CES 2021



Augmented Reality HUD

Prototype >>

- Key features in the HUD include Eye tracking, Advanced optics, AI navigation, vibration control, real-time situational awareness and use of 3D imaging radar

Wide-angle spatial imaging AR HUD system

Product Launch >>

- The solution uses its patented technology – OpticalCore to a wide-angle field of vision (FOV 23 degrees * 5 degrees @ 900mm eye relief, VID 15m ~ infinity)



Intelligent AR HUD for Commercial Vehicle

Product Development >>

- full color laser beam scanning (FCLBS) technology for AR HUD product
- designed to prevent from direct sunlight affecting the projected images, and through the automatic sensing system to detect environment light source and automatically adjust the projection brightness



Full Display Rearview Smart Mirror

Product Development >>

- intelligent rear-vision system that uses a custom camera and mirror-integrated video display. The system captures video from a rearward-facing camera and streams it to a mirror-integrated LCD



Digital Cockpit

Prototype >>

- The solution combines a wide, 49-inch QLED display with a sound system. Touch based control pads and intuitive gesture control
- The new service, known as Automotive Samsung Health, analyzes passengers' health status



Hyperscreen

Product Launch >>

- A giant curvy display—it spans more than 56 inches across
- The display can use machine learning to try to anticipate what the driver wants, based on pattern recognition



Mercedes-Benz

TouchPoint sensors

Product Launch >>

- The TouchPoint Z is a 3D ultrasound sensor system-on-chip (SoC) that combines ultrasound and Z-Force detection with a signal processing ASIC for a complete, standalone, virtual button mounted under different metals, plastics, glass and a variety of veneer materials. Measuring just 2.6mm x 1.4mm x 0.5mm (LxWxH), the TouchPoint Z sensor SoC is designed to replace mechanical buttons and cutouts in materials up to 5mm in thickness for a seamless touch user interface



Smart Glass technology

Commercialized in Cadillac Celestiq Electric Vehicle >>

- This film allows users to instantly, precisely and uniformly control the shading of glass or plastic products, either manually or automatically at the touch of a button
- SPD-SmartGlass light-control technology offers instant and uniform control of the tint of windows that permits them with the touch of a button or automatically using a smartphone, tablet, smart speaker, smart home systems, or other control devices to change tint from dark (blocking over 99.5% of light and 95% of heat) to clear, or any level in between





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An interview with
Roy Baharav
*Hi Auto's CEO on the
future of Voice AI*



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