

The evolution of displays in the automotive cockpit

12-Nov-2020 15:20 GMT

S&P Global
Supply Chain and Technology, Automotive

Automotive displays becoming a key aspect of the in-car user experience

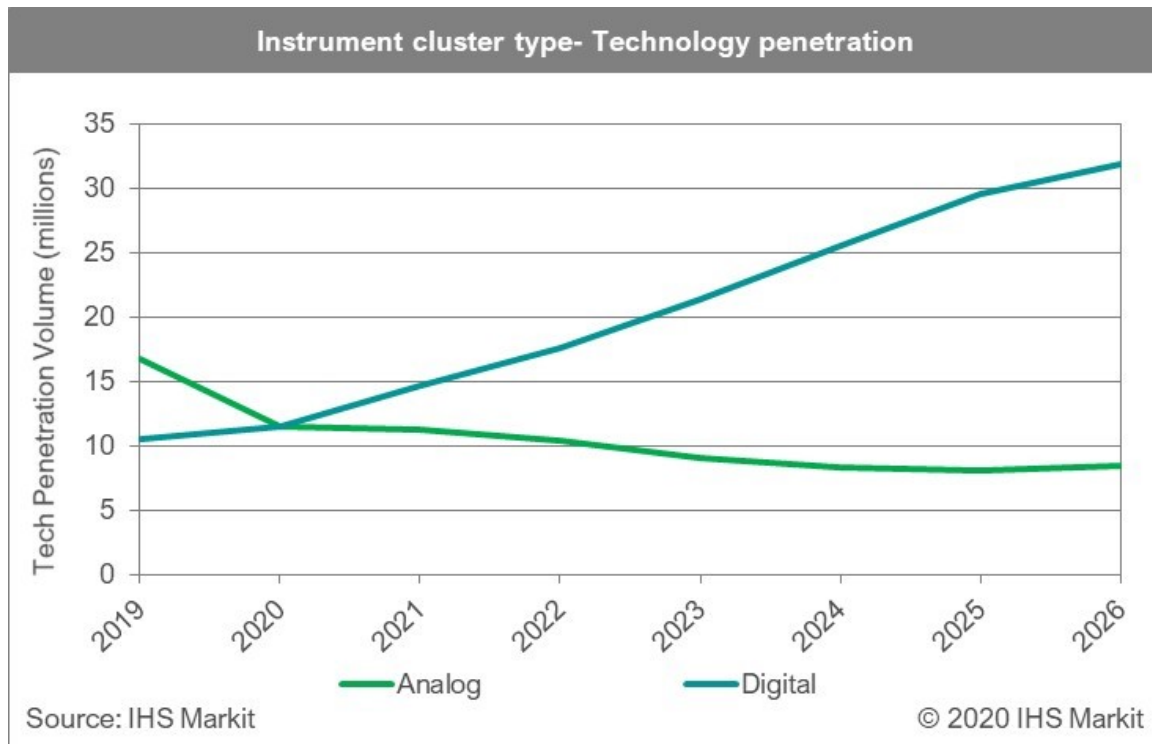
The size of automotive displays has increased over the past few years, as has the number of displays in the vehicle. The rapid growth in display-based instrument clusters; heat, ventilation, and air-conditioning (HVAC) control displays; digital display mirrors (both rear and side view); passenger displays; and displays covering virtually every surface has turned the in-cabin user experience into an immersive digital experience with a focus on delivering meaningful information to the driver and entertainment content to the passenger(s).

Looking only at current production vehicles, and not counting rear seat technologies, the Porsche Taycan currently leads the market for cumulative diagonal measured display real estate with a total of 47 inches, which includes a massive 16.8” curved digital instrument cluster, dual 10.9” center stack and passenger displays, and an 8.4” touch panel HVAC display. While Porsche has taken the approach to create a display-heavy experience through the deployment of multiple displays, there are several emerging trends currently evolving in the automotive landscape.

Modernizing the instrument cluster

One of the most common applications of in-cabin displays is the evolution of the more “traditional” configuration of the cockpit, represented by a digital instrument cluster and a dedicated center stack display. For an automotive manufacturer, this strategy is a cost-efficient way to give the customer a more digital experience while maintaining a more traditional, and arguably less distracting, distribution of information for the driver. This solution is also one that is generally easier to execute as automakers can replace traditional analog gauge clusters with digital displays across trim levels of the same model.

Originating in higher-priced models and trim levels, this display trend is already trickling down to the mid- and standard-priced vehicles. One example of this in practice is the Volkswagen (VW) 12.3” Digital Cockpit (instrument cluster display), currently available across the company’s US (and European) model range, including the Golf, Jetta, Tiguan, Passat, Arteon, and Atlas. In Europe, an 11.7” version of this display can be found on models such as the Polo and T-Roc. Between 2020 and 2026, IHS Markit forecasts that the installation rate of digital instrument clusters will grow from 11.5 million units to 31.9 million units, or an increase from 16.5% of the passenger light vehicle market to 34.1%.



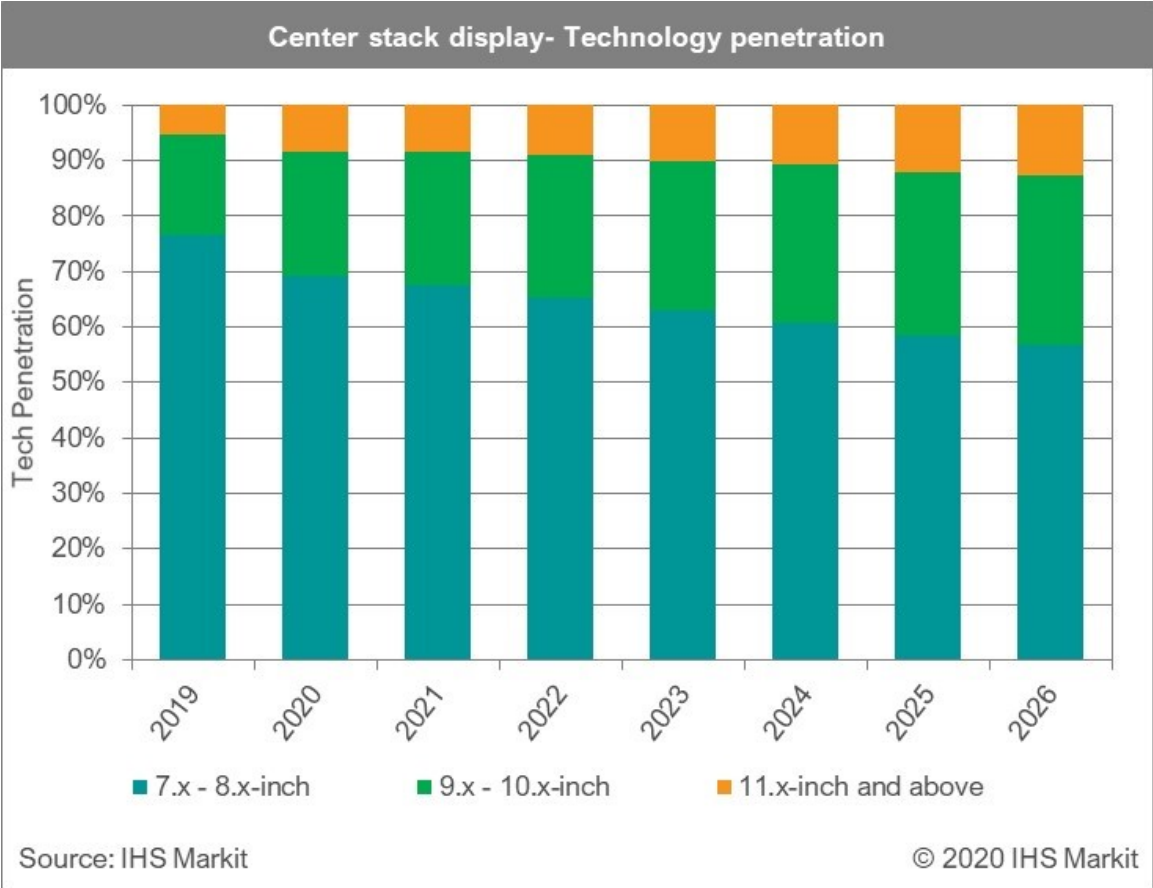
Oversized displays (or combined displays)

Merging the real estate occupied by the traditional instrument cluster and center stack displays into one large display serves to easily differentiate a brand or nameplate from competitors. In the premium vehicle market, technological innovation is often an extremely important factor in the consumer’s purchasing decision. Daimler has been a trailblazer in this area by mounting dual 12.3” displays under a single piece of glass across the S-Class (2020) instrument panel, creating the effect of a single, large display. This display strategy has also made its way into the E-Class for 2021. Taking this approach one step further, electric vehicle (EV) start-up Byton has developed a massive 48” A-pillar-to-A-pillar display in its concept car, the M-Byte. The M-Byte’s giant 48” display, along with a 7” steering wheel display and 8” center console display, could soon outpace the Porsche Taycan with 63 inches of diagonal screen real estate should it make it to production.

Manufacturers have also taken a different approach when it comes to the user experience of combined instrument cluster and center stack displays. Unlike Daimler and the new-to-market Cadillac Escalade, Tesla has chosen to implement a single, landscape-oriented display in the midline of the Model 3 and Model Y vehicles. While this serves to open the line of sight for the driver in front of the vehicle, it also pulls his/her eyes away from the road when checking information such as vehicle speed or advanced driver assistance systems (ADAS) feature status. It is also worth noting that there are substantial cost benefits associated with this strategy in both display hardware and other related hardware/software efficiencies.

The growth in automotive displays is not reserved only for premium segment vehicles. Models such as the 2021 Kia Soul and Telluride (10.25”), 2021 Toyota Prius (11.6”), 2021 Subaru Outback and Legacy (11.6”), and 2021 Ford Edge (12.0”) have all been positioned to attract “technology conscious” buyers, luring them with some of the largest center stack displays in the automotive market. To put this evolution into perspective, in 2020, 7–8” center stack displays make up 61% of the automotive central stack display market. Nine-inch and larger displays account for just over 27% of the market. By 2026, 9” and larger displays, at nearly 34 million units, should account for 41% of the central stack display market. Over this same time frame, 15” display volume is expected

to triple, reaching 1.5 million units by 2026.



Display immersion

Finally, the role of the battery electric vehicle has often been at the forefront of the digital transformation in the automotive cabin. The Porsche Taycan with four displays, the Byton M-Byte with five displays, and the Audi e-tron with five displays have set the stage to define what an information-immersive experience will look like in an era where technology is becoming an ever-present aspect of all facets of life. From the A-pillar side-view display mirrors to the emergence of the dedicated passenger display, these vehicles are used to showcase the pinnacle of what displays are capable of in the vehicle, especially when cost is less of a factor.

The increased production of displays for all industries is quickly improving the accessibility for such technologies in more affordable automotive applications as well. In 2019, Honda announced the budget-minded, urban mobility-focused Honda e (Image 1). With five displays tethered across the dashboard and a digital rearview mirror, this vehicle serves as a prime example of display applications trending throughout a model lineup. As new or refreshed vehicles are introduced over the coming years, this increase of in-vehicle display count is expected to follow suit, often starting with dedicated HVAC displays and digital rearview mirrors.



Honda e interiors

Source: Honda—photo taken by Naoki Kimura, IHS Markit, at a private event organised by Honda in Japan in September 2020

Conclusion

Regardless of the powertrain technology, the number of pixels in our vehicles has increased considerably over the past few years and is expected to continue its upward trend. This is attributed to both a shift toward larger displays and a significant increase in the number of displays in the vehicle. Today, displays can be found across the instrument panel; in the rearview mirror; embedded in the A-pillars; in the front, rear, and overhead consoles; in front seatbacks for rear-seat passengers; projected on the windscreen; and even on the steering wheel. Automotive designers are finding ways to embed display panels on nearly every interior surface of the vehicle, and this will surely have profound effects on how consumers will experience the vehicle of tomorrow.

David Trippany

Associate Director, UI/UX Practice Lead, Supply Chain and Technology, IHS Markit

E-mail: David.Trippany@ihsmarkit.com

CONTACTS

The Americas
+1 877 863 1306

Europe, Middle East & Africa
+44 20 7176 1234

Asia-Pacific
+852 2533 3565

www.spglobal.com/mobility

Copyright © 2025 S&P Global Inc. All rights reserved.

These materials, including any software, data, processing technology, index data, ratings, credit-related analysis, research, model, software or other application or output described herein, or any part thereof (collectively the “Property”) constitute the proprietary and confidential information of S&P Global Inc its affiliates (each and together “S&P Global”) and/or its third party provider licensors. S&P Global on behalf of itself and its third-party licensors reserves all rights in and to the Property. These materials have been prepared solely for information purposes based upon information generally available to the public and from sources believed to be reliable.

Any copying, reproduction, reverse-engineering, modification, distribution, transmission or disclosure of the Property, in any form or by any means, is strictly prohibited without the prior written consent of S&P Global. The Property shall not be used for any unauthorized or unlawful purposes. S&P Global’s opinions, statements, estimates, projections, quotes and credit-related and other analyses are statements of opinion as of the date they are expressed and not statements of fact or recommendations to purchase, hold, or sell any securities or to make any investment decisions, and do not address the suitability of any security, and there is no obligation on S&P Global to update the foregoing or any other element of the Property. S&P Global may provide index data. Direct investment in an index is not possible. Exposure to an asset class represented by an index is available through investable instruments based on that index. The Property and its composition and content are subject to change without notice.

THE PROPERTY IS PROVIDED ON AN “AS IS” BASIS. NEITHER S&P GLOBAL NOR ANY THIRD PARTY PROVIDERS (TOGETHER, “S&P GLOBAL PARTIES”) MAKE ANY WARRANTY, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, FREEDOM FROM BUGS, SOFTWARE ERRORS OR DEFECTS, THAT THE PROPERTY’S FUNCTIONING WILL BE UNINTERRUPTED OR THAT THE PROPERTY WILL OPERATE IN ANY SOFTWARE OR HARDWARE CONFIGURATION, NOR ANY WARRANTIES, EXPRESS OR IMPLIED, AS TO ITS ACCURACY, AVAILABILITY, COMPLETENESS OR TIMELINESS, OR TO THE RESULTS TO BE OBTAINED FROM THE USE OF THE PROPERTY. S&P GLOBAL PARTIES SHALL NOT IN ANY WAY BE LIABLE TO ANY RECIPIENT FOR ANY INACCURACIES, ERRORS OR OMISSIONS REGARDLESS OF THE CAUSE. Without limiting the foregoing, S&P Global Parties shall have no liability whatsoever to any recipient, whether in contract, in tort (including negligence), under warranty, under statute or otherwise, in respect of any loss or damage suffered by any recipient as a result of or in connection with the Property, or any course of action determined, by it or any third party, whether or not based on or relating to the Property. In no event shall S&P Global be liable to any party for any direct, indirect, incidental, exemplary, compensatory, punitive, special or consequential damages, costs, expenses, legal fees or losses (including without limitation lost income or lost profits and opportunity costs or losses caused by negligence) in connection with any use of the Property even if advised of the possibility of such damages. The Property should not be relied on and is not a substitute for the skill, judgment and experience of the user, its management, employees, advisors and/or clients when making investment and other business decisions.

The S&P Global logo is a registered trademark of S&P Global, and the trademarks of S&P Global used within this document or materials are protected by international laws. Any other names may be trademarks of their respective owners.

The inclusion of a link to an external website by S&P Global should not be understood to be an endorsement of that website or the website’s owners (or their products/services). S&P Global is not responsible for either the content or output of external websites. S&P Global keeps certain activities of its divisions separate from each other in order to preserve the independence and objectivity of their respective activities. As a result, certain divisions of S&P Global may have information that is not available to other S&P Global divisions. S&P Global has established policies and procedures to maintain the confidentiality of certain nonpublic information received in connection with each analytical process. S&P Global may receive compensation for its ratings and certain analyses, normally from issuers or underwriters of securities or from obligors. S&P Global reserves the right to disseminate its opinions and analyses. S&P Global Ratings’ public ratings and analyses are made available on its sites, www.spglobal.com/ratings (free of charge) and www.capitaliq.com (subscription), and may be distributed through other means, including via S&P Global publications and third party redistributors.