

7TH DVN STUDY:

**INTERACTIVE SOCIAL
AND SIGNALLING DISPLAYS**



Available from December 3rd, 2024.
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On December 3rd, DVN will release its 7th Study:

“ **INTERACTIVE SOCIAL
AND SIGNALLING DISPLAYS** ”

For this year, DVN study is focusing on this Chinese trend of exterior display, including benchmark, optical concept, technology, electrical architecture, with numbers and figures based on market data from interviews with automakers, tier-1 and -2 suppliers, scientific institutes, and the expertise of DVN's in-house experts.

Study Summary

This study is exploring the different technologies that are used and will be used to realize a display, with a focus on exterior displays. From dozens of LEDs to OLEDs and MiniLEDs, we are explaining the different solutions and how to install them in a lamp and in a car. We have used a lot of examples based on benchmark, supplier and exposition visits to be able to provide an exhaustive panorama of what is existing on the market.

What are the benefits of the study?

We can see 2 main goals: first one is to help you to understand the technology and the possible specification for ISD. To be able to select the right technology for your company. Second one is to understand how is moving the market trend, from a regulation and cost point of view.

Who is the study for?

This study is an additional source of information for the business plan of all OEM, tier 1 and tier 2 companies. To understand better what is happening in China and what is coming in the other countries.

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PREFACE



YANDAN LIN,
PROFESSOR AT FUDAN UNIVERSITY,
CHAIRMAN OF IFAL,
CHAIRMAN OF COMMITTEE OF INTELLIGENT TRAFFIC LIGHTING, CIES

In the era of rapid development of LED products and intelligent control technology, we are fortunate to witness the immense potential and broad prospects of Interactive Social and Signalling Displays (ISD) technology. As a professor at Fudan University and the Chairman of IFAL (International Forum on Automotive Lighting), I am honored to share my perspectives on the development of ISD technology here.

It is evident that the pace of regulation is far behind the development of products and the realization of functions. This not only poses challenges to ISD technology but also provides unprecedented opportunities. In my research group, we have been committed to ergonomics research for a long time. Over the past two years, commissioned by GTB SVP, we have conducted a study on Car Body Lighting (CBL). This study explores the impact of CBL on the distraction of different road users, including drivers and pedestrians, from the perspective of human attention mechanisms and behavioral performance. Our research not only focuses on the potential of CBL to enhance safe driving but also proposes scientific suggestions for CBL in terms of color, brightness, and position based on different interaction purposes. These research results have been published in the journal "Safety Science", and some studies are still in the process of being published. I believe these conclusions will provide a solid theoretical foundation for the future formulation of CBL standards and the development of related products.

With the further development of display technology, ISD technology adopts more display technologies to enhance interaction and safety performance. This requires more scientific research to support, especially in defining the relevant characteristics and parameter settings that affect safety performance and interaction effectiveness. The personalized display and attraction functions of ISD also have scientific settings behind them.

Therefore, this DVN research report is particularly important. It not only shows the current development status and expected functions of ISD technology but also reveals its shortcomings, allowing us to understand the real situation of ISD more comprehensively and thus promote the sustainable development of products more scientifically and healthily.

I look forward to stronger cooperation between the industry, academia, and standardization organizations to leverage the advantages of new products and technologies, avoid their shortcomings, and jointly promote the application of excellent products and the development of the industry.

Let us work together to create a safer, smarter, and more personalized future for automotive lighting.



STEPHAN BERLITZ,
HEAD OF LIGHTING DEPARTMENT, AUDI AG

With introduction of the LED as a light source we had the vision of software replacing hardware. ISD is actually the extreme example for digital lighting and how software replaced mechanical solutions in automotive lighting. You might compare it with infotainment systems, but with the difference that it is used in the exterior. It is made possible with the strong development of digitalization in our cars. It can be used for personalization, an increasing demand in all the markets, and of course also for marketing use cases for the OEMs.

This already now arises requests for stricter regulations. For me a bit contrary, because the biggest innovation regarding safety for this technology is still missing. Communication and interaction will bring traffic safety on a higher level, but exactly for this topic regulations are much slower than the speed of innovation we can experience in the field of ISD. Regulation is not even working on this topic, industry is avoiding this disadvantage by interpreting existing regulations to at least change signatures in specific situations. Every manufacturer by its own, but we would need a common language for V2X to get the highest benefit and safety advantage out of communication instead. The future belongs ISD, not only with automated driving cars, actually as fast as possible.

Because of missing regulations to allow safety communication the industry is developing show functions for the non-driving cars instead of intelligent and interactive functions for the driving situations. We could increase traffic safety during day and night time, but we have to create show functions for parking or charging cars.

Actually it is a bizarre situation: we have really expansive actors, in the future even displays, in our cars, but use them only for infotainment instead of safety. Like having safety belts in the car because they look nice, but not being allowed to use them.

ISD technology is an unbelievable chance for automotive safety. Manufacturers, suppliers and mainly regulatory institutions are requested to tap the full potential.

Hopefully the DVN study will help to push forward our industry to develop further ISD technologies for more safety.



MARKUS QUARTA,
HEAD OF TECHNOLOGY & INNOVATION, ZEEKR DESIGN

We are living in an age where boundaries between the digital and physical worlds are dissolving. Driven by rapid technological advancements and a society increasingly connected through digital interfaces. The automotive landscape is no exception to this. Vehicles, once constructed for the sole purpose of transportation, are transforming into interactive extensions of our digital lives.

The rise of a new generation of customers with a deep desire for personalization and self-expression, has created an opportunity to rethink the vehicle's role in our lives.

Exterior displays represent a powerful medium to bridge the digital and physical world, allowing drivers and vehicle occupants to customize the exterior, convey messages, or even emotions to the world around them. But these displays are not only about customization; they can also play a critical role in enhancing communication between vehicles and other road users. Especially as we transition towards a future dominated by automated and autonomous drive.

The traditional relationship between drivers, vehicles, and their surroundings are fundamentally changing.

Vehicle occupants might no longer pay attention to the surroundings, leaving a critical gap in communication. Exterior displays can fill this gap by signaling the vehicle's intentions to pedestrians, cyclists, and other traffic participants, improving road safety and fostering trust in autonomous vehicles. Whether indicating a turn, signaling to a pedestrian that it's safe to cross, or simply displaying a friendly message, these interactive signaling displays can revolutionize how vehicles interact with our environment.

These displays can be dynamically tailored to suit different contexts and environments. Allowing real-time responsiveness to drivers, passengers, and the surroundings.

A rideshare vehicle might display its availability, or serve as an identifier, to the passenger waiting at a busy pickup location.

As technology continues to blur the lines between the digital and physical, exterior vehicle displays offer a unique opportunity to redefine mobility. An opportunity to transform transportation into a dynamic platform for interaction, while paving the way for a smarter and more connected future.

CONTRIBUTING COMPANIES AND INSTITUTES

OEM



Tier 1



Tier 2



Institutes





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