evolution of the car dashboard

It started life as a strip of wood or leather put in place to prevent carriage drivers dirtying their boots from the mud 'dashed up' by horses' hooves. Things have certainly changed, and our Neil Barrett has been considering 'where next' in dashboard development

HORSES' HOOVES. Yes, that's where this particular technological story begins. Concerned about muck and other things which could be thrown up into the driver's or passengers' faces by horses pulling carriages, the manufacturers installed a physical barrier – usually leather or wood – at the front. This throwing up of dirt and other debris was known as "dashing up" and from there, the original vehicle dashboard was born. Never let it be said that it wasn't multifunctional, even back then.

Many original dashboards were great to hang on to when climbing into the drivers' seat – and they even boasted a handy storage clip for the reins.

GREAT FOR PROTECTION

When horses started to be replaced with engines (and the general consensus was to put this new source of horsepower at the front), dashboards were still great for protection – now additionally from oil and heat. Their position was also ideal for various dials and controls, not least the steering wheel.

Drivers in the late 1930s were the first to experience modern dashboard positioning, with the instrument panel now raised above knee height and – just as importantly from a safety point of view – recessed into the dashboard instead of being less than elegantly stuck onto it. The Chrysler Royal was just one model to use these modern techniques. "Even the controls on the windshield wipers are moulded rubber as an extra safety precaution" was a proud claim of their advertising at the time.

ADDING PADDING

It was to be another decade or so before the next important safety innovation: the padded dashboard. The Tucker 48, often referred to as the Tucker Torpedo (*illustrated right*) is widely credited as being the first car to feature this padding. Perhaps surprisingly, it didn't get adopted widely across the industry until the 1970s but is of course unthinkable to be without now. Between those two points in time, the industry went through its chrome dashboard phase, with some now classic American cars known for their masses of shiny dials.

Fast forward to today and digital instrument clusters in front of the driver are the norm on high-end and some middle-of-the-range models. Some manufacturers such as BMW have hybrid dials, with part of the circle comprising digitally-presented information; others have gone further. In addition, the colour-screen in-car entertainment system combining radio, phone, navigation and settings has made its way into cars at virtually all price points.

At the extreme forefront of the move to go digital is the Tesla Model 3 EV (*pictured above*), with almost every command and piece of information conveyed via a single tablet-style touchscreen, front and centre, with many features – including opening the glovebox – voice-controllable.

> *"The digital dashboard has massive benefits, not least that new features can be added..."*

SOFTWARE UPDATES

Clearly the digital dashboard has massive benefits, not least that new features and style customisations can be added with software updates carried out at the service centre or even over wi-fi. That said, something as simple as a cracked or faulty display could mean 'driving blind' and an urgent spell in the garage. At least with old-school analogue controls, it was more common for individual dials and buttons to go awry - unless things went really wrong.

Back to the innovation and with all this information being presented to the driver in new ways, we have until recently had one big elephant in the room from a safety standpoint: the driver's eyes being off the road for too long. Along came the industry with a solution borrowed from aviation.

The heads-up display (HUD) sees key pieces of driving information displayed in the front windscreen (*pictured on facing page*). In many cases drivers can see their speed, the tachometer and turn-by-turn navigation. Some of these systems work by simple projection onto the windscreen; others use a combiner – a separate piece of material which shows the information. In some cases, such as in various Mazda models, this is smartly retractable when not needed. HUDs have also been built in to some top end motorcycle helmets. The extensive research that was >>

<< the catalyst for HUDs included a lot of work on saccadic gaze – the way the eye is involuntary drawn to an external stimulus. There are great advantages to this human mechanism when driving, such as detecting a pedestrian about to walk into the road. However, there are drawbacks too, such as being lured to a mobile phone lighting up with a new message. Reaction times have been measured and on average they are faster in drivers using HUDs. Whilst we might see the 'eyes on the road' approach to driving as being such obvious common sense, the science backs it up to a bigger extent than you may have first thought.

3D ON THE HORIZON

Of course, innovation never ends. Over the coming months, or perhaps a bit longer depending on the state of the industry, we will start to see three-dimensional instrument clusters. Before you shout back at your magazine that instrument panels are already 3D and have been since day one, I know that. This, however, is about taking digital displays to the next level: virtual 3D instrument clusters which bring the information forward, making it stand out to the driver, without the need for the mechanical parts of old.

There are some clever pieces of tech that are going to make this work. The first is what at least one manufacturer calls 'parallax barriers' which split the image into the two offset views needed to create the 3D image. The second is an interior camera to detect the driver's line of sight. This plus some behind-the-scenes processing adds up to a high tech way to recreate the real dials of old, with imagery and other information presented in an engaging way. There's a big safety bonus up the industry's collective sleeve: the camera can also detect over-focus on the instrument cluster and possible driver fatigue or distraction. The aim is to build on detection systems that have been introduced to cars over the last few years.

Is it gimmicky? Will it go the way of 3D TV? We will have to wait and see, but no doubt something exciting will gets dashed up, and it's unlikely to be mud from a horse's hooves. ■

Top: beautiful veneer on an old classic dashboard.
Above (L-R): a 1950s American dashboard; the cockpit of a Bentley Continental GT; a futuristic Taiwanese car.

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