The evolution of automotive electronics

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I grew up in the 1970s. Our family car was a Ford Pinto station wagon. Everything in it was manual – manual windows, manual steering. The only consumer electronics was the radio. Fast forward to today, cars have more electronics in them than ever. A high-end luxury car, like a BMW 7-series model, can have up to 150 electronic-control-units (or ECU) to control almost every aspect of the car – the engine control unit that manages the efficiency of the car, the steering and the surround view system to avoid collisions; the telematic system that provides information on local hot spots; and the electronic stability/traction control to maintain proper steering, sensors that deploy airbags during a collision. Then there are the audio/video center stack that provides entertainment and navigation, dashboards with heads-up display (HUD), and, of course, electric windows with intelligence features. This explosive growth in automotive electronics is due to both demands by consumers and compliance with strict regulations.

Governmental and corporate compliance cannot be met without electronic innovation. How often have you heard about a serious accident when a vehicle backs up and its driver was unaware of what was nearby? Mandates are underway to require rear cameras in every car to minimize these incidences. Volvo has a goal to reduce the fatality rate in its vehicles to zero by 2020. Automotive OEMs are working hard to meet these challenges. Advance Driver Assistance Systems (ADASes) is made up of various electronics in a car which, when combined, can help avoid collisions and fatalities. An ADAS can comprise of radar, laser, cameras, and GPS/telematics to predict collisions and take action before an accident can occur. Current ADAS electronics can prevent over-steering when a driver hastily reacts to an incident and prevent dangerous lane departures due to blind spots. In the near future, ADASes will use GPS/telematic systems to predict collisions based on the location of other vehicles on the road. Eventually, cars can and will drive themselves.

Looking back at the past two years at the Consumer Electronics Show, one third of that conference focused on new electronics inside of cars. Consumers are demanding that their cars connect with their smart phones to listen to music, search the web, view traffic conditions, and update Facebook statuses. Car makers realize that the millennium generation focuses less on the performance and the mechanical features of a car. What sells are infotainment systems that allow a new

generation of drivers to stay connected and enjoy entertainment how and when they want it. Ford started this trend and sold more cars in the past several years because they teamed with Microsoft to develop the Ford Sync system. It was simple, reliable, and cost-effective. Yet, with the myriad distractions both inside and outside the car, ADAS-provided safety is still needed to make the car smarter with the ultimate goal: reduce fatalities due to driver distractions.

In my future blogs, I will get into more details about ADAS and automotive consumer electronic trends.

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