AUTOMAKERS BECOME SOFTWARE COMPANIES

As the smartphone market continues to expand and initiatives like smart electric grids continue to pick up steam, another industry has begun getting "smarter" with software and apps: the automobile industry. Ford, BMW, and other automobile companies are enhancing their vehicles with on-board software that improves the customer experience, and the auto industry is working on technology that will allow cars to be managed via the cloud.

Automakers are finding that software is a way of adding more "value" and freshness to their products without having to invest so heavily in new vehicle production. It takes Ford Motor Company, for example, about two and one-half years to plan, design, and build a new car. Design and production, including metal stamping equipment and assembly line setup, must be finalized long before the car rolls off the line. But the auto makers can create a new software interface for a car within months and update it again and again over the life of the car without much lead time. This enables Ford and other automakers to significantly improve the passenger experience and add new features to cars years after they are built.

Ford is perhaps the automaker doing the most to innovate with software and apps. Its MyFord Touch interface is an in-dash touch screen available for select vehicles with controls for navigation, music, phone integration, and temperature. Ford has upgraded this interface and the Sync software behind the interface, adding tablet and smartphone integration and better voice response. In 2010, Ford added support for the online music streaming service Pandora, which is very popular among young potential buyers. This update enables drivers to connect their tablets and smartphones to the Sync system to access music and other apps using voice commands.

Chairman Bill Ford Jr. has championed the use of software to alleviate urban congestion by investing in technology that responds to the problems created by traffic in the biggest cities. Theoretically, technology might help cars to avoid traffic jams, to reserve parking spaces in advance, and possibly to even drive themselves.

To manage vehicles in this way, cars need to be connected to some kind of central system, which would coordinate with public transit and other transportation methods, and to do this, cars need to be equipped with software that can monitor and enhance vehicle function at the most basic levels. The eventual system would require that cars feed increasing amounts of information to systems whose purpose would be to minimize highway congestion. The system would also require an industry standard, which does not exist as of yet. Ford has doubled its investment in vehicle-to-vehicle communication technologies and BMW is also continuing to develop ways for vehicles to communicate with one another on the road to avoid collisions.

With the inclusion of software in their cars, automakers are entering uncharted territory. They must now devote resources to updating and testing their software, as well as establishing ways to provide the updated software to their customers. Car companies need to coordinate their car development cycles more closely with their software development cycles. Also, many of the technologies included in automobile software packages raise the same privacy concerns surrounding location tracking that have often plagued smartphone manufacturers and app developers.

Ford is grappling with the best way to roll out software upgrades to its customers. The company has been mailing USB sticks to 250,000 customers whose cars have an advanced touch screen control panel running the MyFord Touch interface. The stick contains a software upgrade that will improve navigation controls, the music and phone features, as well as the ability to control car temperature. The upgrade also contains code that will upgrade system speed and improve the interface based on common criticisms from Ford owners.

Although Ford says it plans to continue issuing software upgrades this way, the company hopes that customers will get into the habit of checking the Ford Web site for software upgrades on their own. Though most car owners are used to the technology in their cars remaining constant throughout the life of the car, newer cars are poised to change all of that.

Ford has hired "human-machine interface engineers," whose job is to analyze how their customers interact with the software in their cars. Often, these engineers use customer feedback to make changes to the software. Customers complained that too

much information was available on each screen of the interface, so Ford moved the most commonly used features to more prominent positions on screen and increased their font size, relegating the rest to submenus. Feedback has been positive. Ford has also asked dealers to dedicate more time and personnel to hands-on technology training to help customers master its interface.

GM, Daimler, and other companies are all developing new features for their cars that operate online in the cloud. Users will be able to remotely track their cars (you'll never forget where you parked again) and diagnose problems with the car, like low tire pressure or the need for an oil change. Corporations will be able to track employee use of company cars by interpreting car sensors and engine readouts. Manufacturers will be able to aggregate and analyze the data from customers' cars to identify quality problems and, if necessary, quickly issue recalls. Just as with apps, the possibilities are limited only by the imagination of automakers.

GM will allow its app developers to access its computer systems to improve app function, which raises a familiar set of privacy concerns. Auto analysts believe that automakers will make mistakes as they learn how to properly handle sensitive customer data and to provide robust privacy options. On the other hand, automakers are hoping that younger customers who have grown up using Facebook are less likely to care about privacy, and features that collect highly targeted information about a car's location and driving habits.

BMW is also investing a whopping $100 million in mobile apps, hoping to market them to their customers as "premium services." Some analysts are skeptical of the decision to invest that much money, but BMW believes that mobile apps will become an increasingly attractive selling point for customers of its BMWi electric and hybrid cars. Although the future of cars sharing information with other nearby cars is still years away, automakers are excited by the possibilities afforded by smart software and apps.

Sources: Ian Sherr, "Cars Pump Up IQ To Get Edge," *The Wall Street Journal*, January 13, 2012; Chris Murphy, "4 Ways Ford Is Exploring Next-Gen Car Tech," *Information Week*, July 27, 2012; Mike Ramsey, "Avoiding Gridlock with Smart Autos," *The Wall Street Journal*, February 27, 2012; Joseph B. White, "New Driver's Ed: Tutors to Decode High-Tech Dashboards," *The Wall Street Journal*, May 8, 2012; Chris Murphy, "Ford is Now a Software Company," *Information Week*, November 28, 2011 and "Why BMW Suddenly Loves Mobile Apps," *Information Week*, March 2, 2011; and Chuck Squatriglia, "Ford Brings SmartPhone Apps to Your Dashboard," *Wired*, April 20, 2010.

CASE STUDY QUESTIONS

1. How is software adding value to automakers' products?

2. How are the automakers benefiting from software-enhanced cars? How are customers benefiting?

3. What value chain activities are involved in enhancing cars with software?

4. How much of a competitive advantage is software providing for automakers? Explain your answer.