

Integrating Mobile Devices into the Car User Experience

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Abstract

Today, the User Experience in Cars is traditionally defined by controls and devices that belong to the car itself. The emerging mobile devices intruded the User Experience within the car. These mobile devices were first used to perform services that are not part of the manufacturers' original car User Experience like making phone calls using the car stereo. In future, mobile devices will be fully integrated into the car and will be even a functional part of the car itself. This leads us to many new challenges considering the User Experience in cars like creating a holistic and consistent User Experience for the car and the mobile device or physically integrating the mobile device into the design of a car.

Keywords: Automotive, Mobile, User Experience, User Interface

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1 Traditional Car User Experience

User Experience (UX) in cars traditionally consists of interacting with the environment (e.g. “interaction” with other cars), physical controls (e.g. throttle pedal) and digital controls (e.g. car navigation system) (see Figure 1). Manufacturers of cars often face the problem of creating a holistic UX for the whole car environment and especially for the different users of the car (driver, front seat passenger, back seat passenger). Without doubt, all three roles will have a slightly different UX and the challenge is to let all these experiences be felt like the manufacturers intended UX.

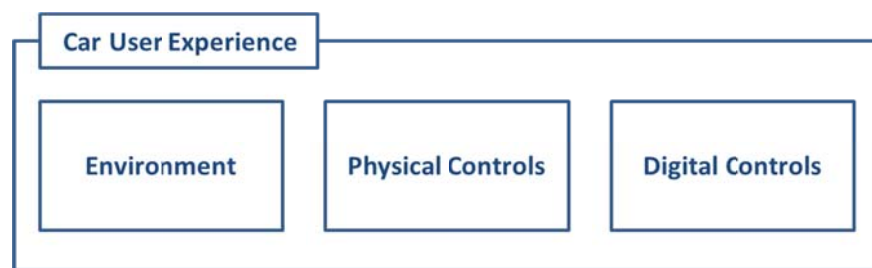


Figure 1.

Traditional UX influence factors in the car environment

When building a car, especially physical and digital controls are influenced by different roles regarding the car development lifecycle. Interaction with digital controls is, for example, designed by user interface designers of the IT department or digital devices are delivered from a third party manufacturer and only adopted to fit somehow into the car environment without regarding the holistic UX at all. Physical controls are usually designed by industrial designers who do not necessary have direct access to anyone within the IT department.

Innovation is more and more driven by user interfaces and the digital world. But this must be well integrated into the UX of the whole car. The main challenge of a car manufacturer is to bring all these aspects together and create a consistent holistic car UX that enables the user to feel the brand. The following chapters will show that mobile devices represent an important part of the car UX and indicate challenges that arise in addition to the traditional ones.

2 Emerging of Mobile Devices into the Car UX

In the last years, successful car manufactures got used to traditional challenges and mastered it. Unfortunately, emerging mobile devices intruded the UX environment with services that are not influenceable by the car manufacturer at first sight.

Mobile devices extended the car UX with services that were not considered when designing the car like browsing the internet with a mobile tablet on the back seat of a car (see Figure 2). To be able to use mobile devices in an appropriate way, car manufacturers and third party vendors offered solutions like tablet holders. By doing so, the car UX (usage of mobile devices included) improved, but the users were still not able to feel a holistic UX when using mobile devices in the car. There was always a disruption between traditional car UX factors and the usage of mobile devices.

Nevertheless, mobile devices also brought up huge opportunities for car manufacturers to improve the car UX by supporting the use of mobile devices in the car.



Figure 2.

Mobile tablet used in the car [1]

3 Integration of Mobile Devices into the Car UX

Recently, mobile devices could continue their triumphal procession throughout the society leaving the demand to have them fully integrated into a holistic car UX. Beyond being just able to use mobile device in the car, in future automotive interfaces, mobile devices will be part of the interface. They should be fully integrated into the car UX. In the following, we will show example concepts that indicate how such integration can be done.

A Volkswagen concept [2] (see Figure 3) shows how an iPad could be part of this UX. In the concept, it is intended that the iPad is used as a multifunctional touchscreen serving as media center, controls (climate, hazard warning switch), hands-free telephone and navigation system.



Figure 3.

Volkswagen Bulli concept [2]

Beyond that, the Smart scooter concept [3] (see Figure 4) shows an approach where the vehicle cannot be operated at all without the mobile device. Although it is not a car concept, it shows the huge potential. In this concept, the smartphone serves as control and communication unit. Before starting the electric scooter, the smartphone has to be inserted into a custom holder which cross-links it to whole scooter electronic. It serves simultaneously as immobilizer system and anti-theft protection.



Figure 4.

Smart scooter concept [3]

Lots of other usage scenarios are imaginable. Mobile devices enable that parts of the car are always with the user. Users could start auxiliary heating from their mobile device; the alarm system of the car could be connected to the mobile device; the mobile device could serve as key for the car. These concepts emphasize that in the near future a holistic UX in cars will face lots of new challenges. Some of them are shown in the next chapter.

4 Challenges

As stated before, one of the major challenges will be that the UX of the car not only takes place inside the car. Fully integrated mobile devices will intrude the car environment and enhance the UX to interactions that take place somewhere else, but are related to the holistic car UX. The car UX will consist of interactions and services that are not even in the scope of car manufacturers at the moment.

Another challenge will be to create a holistic UX for the car and the mobile device. This UX has to transport the manufacturers brand through all touch points – the user should always have the same experience regardless if he is using physical controls, using digital controls that are built-in, using mobile devices, or interacting with the environment.

Furthermore, the physical integration of the mobile devices will be a huge challenge. Car manufacturers have to consider some kind of holder or docking station for the device which will influence the car UX.

Future Work should explicitly address challenges that influence the future car UX like security, safety, legal authorization, and develop a method that allows engineering a holistic car UX, comprising fully integrated mobile devices.

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