

Interactive Design and the Human Experience: What Can Industrial Design Teach Us

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Abstract. With more than a third of PC users, 37 percent are now turning to Smartphones and Tablets to surf the Internet and access entertainment. With this dynamic shift, the use of the wide-open Web has migrated to a semi-closed platform, or Apps, that uses the Internet for data transportation, something once performed by a browser. Users are accessing data all at the same time these devices are becoming intergraded into every aspect of modern life. User interfaces and experiences are changing and designers and developers have to become aware of addressing these changes.

Keywords: User Experience, Industrial Design, Design, Mobile Computing.

1 Introduction

Mobile Computing, Smartphones and Tablets, continue to become such an integral part of contemporary society. These devices have created a large shift in terms of connectivity. With more than a third of PC users, 37 percent are now turning to Smartphones and Tablets to surf the Internet and access entertainment [1]. With this dynamic shift, the use of the wide-open Web has migrated to a semi-closed platform, or Apps, that uses the Internet for data transportation, something once performed by a browser. This shift is not always by choice or rejection of the Web, but out of convenience. These Apps provide the user with ease and a direct link to the user task, as well as simplifying the user life [2].

Mobile devices are no longer just a connection to information, but are starting to become incorporated into everyday living. Car manufacturers, like Ford, are increasing Bluetooth integration to allow mobile devices to stream music through the cars' audio systems, while the company Visteon is planning on mobile devices to become fully integrated into the car. Their aim is to go beyond replacing the car stereo and will do so with the developed Device to Vehicle HMI (human/machine interface). The HMI concept looks at operating the vehicle entertainment system, climate control and other systems with personal mobile devices. What is unique about this system is that there is an integrated dock to provide power, but the system is entirely wireless which allows anyone in the car with the appropriate device to have control over certain aspects. Though tight coupling between consumer electronics and

the automotive industry can be very problematic: a cell phone has a typical lifespan of 18 months and an automobile an estimated lifecycle of 8 to 10 years.”[3] The consumer lifespan of a tablet has not been established yet, but it is safe to say that a car will typically last beyond consumer electronics.

The car is not the only product that is starting to couple mobile devices. Other examples include home electronics such as TVs, sound systems, heating/cooling systems, coffee makers and electrical outlets for homeowners to be in control of their energy. The majority of these products, however, will outlive the mobile devices. This is an issue with all consumer electronics that are starting to integrate mobile devices into their products. But Companies like Qualcomm have developed and continue to better chipsets, on an open-source networking, so that communication between the product and multiple devices from various manufacturers improves.

With the shift from accessing content, games and entertainment from the PC to mobile devices, users are being accustomed to do more with these devices. They are now being trained and accepting to use their devices to do things beyond the web and control various items and tasks on location. As the shift continues to grow, designers are going to be confronted by new challenges, and the focus will keep growing and developing content driven sites, application interfaces, and ultimately to virtual control panels. The user experience is not tied to the physical, but is manifested itself into the entire experience, virtual and physical.

2 The User Experience

As the shift keeps moving into these semi-closed connections and integrated products with mobile devices, the user has to go beyond the novelty and even usability. The developments of these Apps have to provide a connection and a desire for the users. Apple App store alone has 425,000 apps and developers have created an incredible array of over 100,000 native iPad apps [4]. The competition is abundant so to keep the user interested, a connection needs to go beyond usability. Technology and user interface design should start to be seen as not just about usability or functionality, but also in the same light as any physical object. The virtual world and the physical world are becoming integrated and as designers the approach should be looked at not separate but integrated. “Dreyfuss stated, “Industrial design is a means of making sure the machine created attractive commodities that work better because they are designed better. It is coincidental, but equally important” [5].

Since the development of the computer, there has been a separation between the hardware and software. The hardware, especially the devices that we handle have fallen to the industrial designers. But the software has not always been thought of the same way in its design and development. There are unique attributes to the virtual, where one cannot see the physical, so a perceptual language grows to help a user navigate in this new environment. Technological advances in the modern era has philosophically created a disconnect, “It is a product of a modern world view that seeks to separate and purify the categories of the human and the technical, ignoring and downplaying the degree to which humans and objects have always mutually

shaped each other” [6]. The use of tools is infused in humanity. There cannot be a separation to human and nonhuman devices because we are interconnected. But anytime changes take place, people must be able to perceive the value and understand it [7].

This separation can be seen in how usability was originally defined as the degree of efficiency and effectiveness of use within a specified range of users, tasks, tools, and environment [8]. This is the very basic concept of usability. But to be able to quantitatively discern usability, Shackel [9] who suggested four dimensions of usability: effectiveness, learn ability, flexibility, and attitude. Usability in this sense only looked at the mechanical aspect; did this do what it was intended to do and could the user complete the task? This way of looking at usability ignored the emotional side of humans. This is especially true when this comes to consumer products. For example, when a consumer decides to purchase a car they do think about usability or function of a car. If that was all consumers wanted then all cars could look exactly the same. Instead, consumers think about the place of a car in their life — how it fits their budget, their desire for comfort, their need for peace of mind, the aesthetics [10]. Functionality and usability are expected, but the user experience goes beyond functionality. Users are also looking for pleasure in products use [11], and emotional, experiential aspects related to appeal, aesthetics, or product image [12]. This can be seen in how mobility devices are not just devices; they have been marketed to consumers on an emotional level. The connections to these devices are more than just utilitarian to the user; they are becoming a central device for modern day living.

The user experience is not being tied to just the ease and use of a product or a software, but the over all experience. Accessing content via the Internet that once was a stationary event in front of a computer, is now nomadic. All users can now access information, content, and entertainment almost anywhere and at anytime. The experiences for each user changes and because of their environment, how they access content has changed. The way that consumers are accessing products is changing, so now they are starting to have choices of how to interact with products. The new definition of usability of a consumer electronic product is “satisfying the users in terms of both the performance and the image and impression felt by them.”[13] This is not just related to consumer electronic devices, but to all things that a person interacts with. Developing Apps, Web Sites, Software, have all become the extension of the product or the company. The best products talk to their potential customers on an emotional level, as well as satisfying functional needs [14].

The physical experience is being replicated into the virtual environment. There are many factors that have to be considered in the design process, the experience that the user will have will be based on there perceived experience with the interaction they have, but this will be coupled with other experiences they have had in the past with similar products. Users bring their past experiences with them.

“Design choices about visual similarity to existing products may affect customer perceptions of value by affect designed to and the extent to which the product stimulates analogical reasoning, which facilitates the

cognitive change necessary for resolving incongruity; and the design choices about the product's visual appeal influence the extent to which the product stimulates positive affect infusion, which also facilitates cognitive change. As the incongruity triggered by the innovation's novelty is (not) resolved, the cognitive and emotional responses to it change, making the perception of its value a dynamic constructive enable transfer of knowledge from available trigger cognitions and emotions with a positive effect on perceived value.” [15]

Though if the functionality or what the user perceives to not be, achieves the same level or a better experience from the user's experience, this can have a negative effect. Especially in mobile devices, the Apps are an extension of the physical device and perceptions of the device is placed into the App. Also if the App is an extension of a company, the perceptions of that company can be transferred to either the physical or virtual aspects; meaning that if a user has a favorable view of the company prior to the use of the companies' virtual presence, that view is carried over. Though the virtual presence of a company can have an affect on the overall company favorability.

3 Design Choices

Usability has gone beyond the pure functionality, once a user learns to use and navigate; the emotional and cultural needs rise. To the user, functionality does not end with usability, but is the self being satisfied. This is ambiguous. How do these emotional needs get met? One method is “understanding of people’s sensorial perceptions and cultural values, where products have added value, meeting user’s true needs and making their experience more meaningful.” [16] The user experience is not just tied to the interface or the product, but the user projects their understanding through a set of values and understanding that they have learned through their culture and social upbringing. The user does not just bring past experiences of knowledge that can be directly related to interface or product, but they bring a large set of knowledge that has virtually no connection.

As technology tries to create a compatibility that works for all, through standardizations, “there is a danger of a loss of cultural identity and tradition.” [17] It makes sense to try to create standardizations in technology, but the human factor is easily lost. The Industrial Designers Society of America defines one aspect of the responsibility of an Industrial Designer “The industrial designer's unique contribution places emphasis on those aspects of the product or system that relate most directly to human characteristics, needs and interests. This contribution requires specialized understanding of visual, tactile, safety and convenience criteria, with concern for the user.” [18] Most of the development of software has been centralized in or by USA developers. The concerns of the users have been thought of, but only on one level, western culture. To be able to truly develop a connection to the user beyond functionality, cultural factors need to be addressed.

Another aspect that developers have to start to pay attention to is how the user will interact with the Apps. Mobile devices allow the user to access content from virtually anywhere, but design decisions and usability are still made on the idea that a person will access the content in a consistent manner. As users access data nomadically, development has to take into consideration the potential way that users will access the data. The physical world plays a major role in the satisfaction of experience. Users usually do not associate these two things to the emotional connection, but if a user is attempting to access data and they are in a situation that is adding stress, they will develop a negative attitude to that App or site.

4 Safety

Developers need to start to address the potential safety issues that a user may have. Though an argument can be made that it is the user's responsibility to access data in a safe manner, but functionality does play a role when and where a user may access the data.

(...) well-designed device that reduces distraction at the operational level may actually undermine driving safety if it encourages drivers to use the device more frequently while driving. This usability paradox occurs when increased ease of use reduces the distraction of any particular interaction but increases overall risk by encouraging drivers to use the device more frequently. This tendency for drivers to adapt to improvements and thereby undermine the expected safety benefits is a common phenomenon. For example, when roadway improvements are made (lanes widened, shoulders added, lighting improved), speeds increase. Drivers may view hands-free cell phones as safe to use while driving and so make more calls than they would with a handheld cell phone. [19]

Most of these Apps take into account usability, but may have overlooked the issue of time of use. Most App development is based on a specific task, and the development sets out to accomplish that task. When devices are mobile, an approach has to be developed by the development team to identify how a user will use the App. Though an App is virtual, the fact remains that a user is able to be nomadic with their mobile device and the Apps.

5 Conclusion

The way people access information, entertainment, and social networks are changing rapidly. Even the way that productive software is changing. Usability will always be

at the core but people are looking beyond the function; they are looking at the experience. The line between software and product continues to blur. Content has become truly mobile and mobile devices are becoming multifunction devices. Devices now have the ability to allow people to communicate, find information and control various products, all on one device. These devices are chameleons; a development of an App is not for whichever device but the App becomes the device and the App becomes the product. As content is accessed on the move and content is becoming accessed in a semi-closed avenue, usability has to extend out beyond just function. Designer and developers of software have to start to think more like industrial designers, to think that they are creating product.

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