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EXPERIENCE DESIGN
Current And Developing Trends in Industrial Design and its Impact on Education

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ABSTRACT

With the proliferation of computer technology and networked ability embedded in most products today, traditional educational disciplines taught in a silo fashion urgently needs reform. Future generations of designers need to be able to work as collaborators to be prepared to handle the complexity of computing products and their experience of use. Moreover, industrial design traditionally with deep roots in the arts will be challenged, as companies seek product differentiation as a brand strategy rather than individual self-expression.

Key word Human experience of use, interaction, networked products, interdisciplinary education, user research, brand expression.

1 INTRODUCTION

The most life altering changes affecting human lifestyle of this century has to be the invention of the computer and the Internet. It not only affected the way people live and work, it also created many complex issues that creators of products have to face. Now that computing and networkability permeates most products, how does it affect us as designers? What is the meaning of products today and how does it affect design education? This paper attempts to bring to light that the industry has evolved to a stage where designers need to look at designing for people's overall experience rather than focusing on designing hardware products. This shift in thinking has important implications for educators and the commercial industry alike.

2 CURRENT AND DEVELOPING TRENDS IN INDUSTRIAL DESIGN

2.1 PRODUCT AS BRAND EXPRESSION

At the advent of the industrial age, as products became mass-produced, inventors and manufacturers focused on the inherent functionality of a product replacing a manual activity (e.g. the washing machine). In today's mass-market world, products are created and replaced at an astonishing rate and endless varieties abound. Products with very much the same features saturate the market, making it hard for consumers to distinguish among competing products. Scott Bedbury, VP of Marketing at Starbucks has said, "in an age of accelerating product proliferation, enormous customer choice, and growing clutter and clamor in the marketplace, a great brand is a necessity, not a luxury." *(1)*

Since companies cannot compete solely on offering unique product features, brand equity and product differentiation become much more important. Products must differentiate themselves through a combination of design, functionality and brand promise. Much has been written about the importance of brand in today's economy. However, developing a strong and recognizable brand alone is not enough; the product serves as a post-purchasing experience delivering a brand promise. Without a satisfying product experience, a company's brand cannot be sustained.

Despite all the attention on branding, a common mistake is to treat a brand merely as a logo. A logo or a brand mark is the essence of a company captured in symbolic form. However, what serves to live up to the expectations and trust of a company is the product experience. "A company's brand is more than just a name and logo— it's the essence of what the company does." *(2)* Sometimes this is referred to as 'brand soul". The soul of a brand encompasses the personality and values of the company. Often this is driven by the company's mission statement and delivered to consumers through advertising and marketing. Apple's "Think different" campaign is a good example—it describes what the company

is about and that message is conveyed through the unique physical form factor, the visual language and the interaction behavior in all of Apple's products, whether hardware or software. (Figure 1)

Figure 1. Apple brand message conveyed in all of its products.

From an economic perspective, product as brand strategy will become increasingly important especially in countries like China. As China enters the World Trade Organization, product differentiation and brand awareness will become critical for Mainland China companies to compete both locally and globally. Many established brands from Europe and the US that realize the importance of branding will enter China to compete directly with its domestic products as manufacturing costs and trade barriers are lowered. Likewise, China's products will be competing as its own brand in foreign markets. Thus, Mainland China companies can no longer play the role of followers (Figure 2), but need to establish themselves as global brands differentiating their products in the international market. "…Chinese manufacturers are seriously contemplating catching up with foreign products, selling Chinese goods overseas or even in major Chinese cities. 'With participation of WTO before us, every company has begun to notice the importance of brands.'" *(3)*

Figure 2. Innovative Apple iMac (left) and similar design eMachines eOne (right).

2.2 HARDWARE & SOFTWARE INTEGRATION

2.2.1 FORM FOLLOWS FUNCTION

Traditionally, Industrial design has placed much emphasis on the physical form of a product. The roots of the industrial design profession are in styling; tracking the history of designers such as Raymond Loewy and the styling departments of the Big Three auto makers (GM, Ford and Chrysler). While physical form and the emotional qualities that a product provokes are important, designers today are faced with much more complex issues with more and more computer interfaces. Compared with traditional products, most exhibited one "layer" of functionality; a toaster toasted bread, a pencil sharpener sharpened pencils. Today's products involve interaction on many levels and perform many functions all within the same package.

2.2.2 MOORE'S LAW AND THE DECLINING COST OF NEW TECHNOLOGY

As the power of computing chips double every 18 months (Moore's Law), the advancement of technology and the availability of inexpensive chips and LCDs have created a plethora of devices designed to "simplify" our lives. From cell phones and PDAs, to electronic books and car navigation systems, consumers are bombarded by the latest techno-gadgets every day. What this means is some age-old products have received new functionality through the addition of screen-based interfaces (e.g. telephones and cameras), meanwhile, new categories of products have been created utilizing new and inexpensive technologies (e.g. MP3 music players, PDAs). This allows for functionality that goes beyond the mechanical and electrical world – storing and retrieving digital information, automating tasks, editing content on the fly, etc. All this introduces another dimension of human computer interaction with products not feasible previously.

2.2.3 MORE AND MORE COMPLEX INTERFACES

With these new "layers" of functionality come more complex interfaces that must be carefully considered and designed to be able to meet a variety of user needs. As interfaces expand to include not only the hardware product controls, but also the software interface, today's products need to consider the entire user experience integrating both hardware and software interactions.

Hardware and software have historically been developed separately from each other. More often than not, the software component is a screen-based interface stuck onto existing hardware designs. This creates a truncated user experience when the user's thought process and tasks includes interacting with both the hardware and software. For example, anyone who has tried to program a video cassette recorder can attest to the frustration of that experience. Therefore designers need to look at the bigger picture of the entire user experience and treat design as a holistic problem solving discipline based on complete scenarios of use rather than working in territorial bounds of hardware or software differentiation.

2.3 ADVENT OF NETWORKED PRODUCTS

2.3.1 THE ERA OF UBIQUITOUS COMPUTING

With the advent of the Internet, today's products not only have embedded computing inside but are now networked and can interoperate. Computing permeates every aspect of our lives and its interoperability means that products will become even more complex and frustrating unless they are designed with a great deal of forethought and planning.

Products in the networked era are no longer stand-alone entities. This new category of products is also known as information appliances. *(4)* (Figure 3) As networked products they should work as systems of devices. As an example, think of today's MP3 music players. The experience not only entails listening to music on the portable player, but includes downloading songs from the Internet, converting digital music files for storage and access on the computer hard drive and transferring to the MP3 music player. There are multiple points of interaction and different situations of use, each contributing to the overall experience of the user.

Figure 3. Information appliances.

2.3.2 NEED TO CONSIDER OVERALL USER EXPERIENCE

In the past 10 years, much has been talked about on "user-centered design". But as products evolve into multi-connected product systems, user-centered design considering single products is not sufficient. Consider the evolving market for electronic books. Designers must consider every interaction as part of the user experience, from purchasing books online, downloading, organizing, editing and reading. Additionally, experiences of using e-books must surpass well-established paradigms of reading traditional paper bound books. There must be more advantages to the "enhanced" experience for users to adopt the new paradigm. Designers therefore have to consider the larger picture of use focusing on the user's goals and the overall experience, taking into consideration the subsystems needed to complete a successful experience.

3 EXPERIENCE DESIGN

3.1 WHAT IS AN EXPERIENCE?

To design for a successful user experience, we have to first understand what is "an experience". To date, papers have been written in an attempt to better define "what is an experience?" *(5)* According to Aristotle, an experience has a beginning, middle and an end. And John Dewey, a famous philosopher defines experience as "A piece of work is finished in a way that is satisfactory; a problem receives its solution… [and] is so rounded that its close is a consummation and not a cessation." *(6)* Just as user experience has no boundaries, different design disciplines must break the boundaries between them and work together to more fully understand these experiences.

Relating to the design of products, one could define a successful product experience as a positive engagement between a product(s) and a person, allowing him/her a satisfying or gratifying experience. In doing this, designers have to shift the mindset of designing for actual end products to designing for an overall experience of use. It's the difference between designing a cell phone versus designing a means for people to communicate. The latter approach can open up tremendous doors for imagination, unbounded by pre-existing forms of previous solutions. Simply put, designers must first define what the experience should be before designing a product or physical embodiment to support

that experience.

4 IMPACT ON EDUCATION

4.1 IMPORTANCE OF MARKET RESEARCH AS PRODUCT STRATEGY

Well-established brands understand the value and importance of market research and strategic product development. As established American and European brands prepare to enter the China market, they will apply their vast experience in market research to understand the wants and needs of the Chinese customer. For China's manufacturers, it will no longer suffice to merely copy foreign brands to serve the local market, but they will need to compete head-to-head with foreign companies in the international market. Research and strategy will help drive the brand to the customer, anticipating his or her needs and marketing directly to them. Both foreign companies and Mainland China companies can benefit from discovering the needs of the Chinese market and focusing their products and brands on addressing those needs. Likewise, Mainland China manufacturers must learn about the US and European markets if their products are to compete successfully outside of China.

Moreover, a well-designed product hitting the wrong market will not be successful. For example: the *Modo* handheld and the *Audrey* Internet device are both beautiful examples of industrial design, however, without the right target audience and proper assessment of the market need, these products were market failures. Just because technology allows us to control our toaster from the office, does not mean that users crave that capability. Well-executed market research determines the value of new product concepts and helps guide manufacturers to deliver appropriate solutions meeting real people's needs.

4.2 EMPHASIS ON USER RESEARCH AND ITERATIVE USER TESTING

As new product experiences are created and move through a natural evolutionary path, user research continues to be important in defining how user expectations are met. Research and testing with users at different stages during development contributes immensely to the design process. During the initial stages of the design process, user research using ethnographic and observational techniques can unveil implicit needs and identify unmet opportunities. Later, users can react, and interact, with early concepts and interactive prototypes to provide valuable feedback. This is especially important as designers strive to establish new scenarios of use with products that never existed before in the market. For example, when designing medical devices, Fitch's design team started with in-depth user research in hospitals, interviewing and observing nurses, patients and doctors to better understand the different needs and context of use. Later, three-dimensional prototypes and simulated software were created to test out previous assumptions gathered from user research.

Figure 4. User observation and user testing.

To date, too few design educational programs place the appropriate amount of emphasis on user research and user testing. Schools must put more robust programs in place that include such informative tools for the design process to better prepare design students for the professional world.

4.3 NEED FOR INTERDISCIPLINARY COLLABORATION

As mentioned earlier, facing the challenges of designing more complex systems necessitates hardware/software integration translating to interdisciplinary collaboration across many design disciplines (including industrial, interaction, graphic and environmental design). Likewise, educational programs should examine the need for design students to collaborate in the same fashion.

In addition, traditional design education emphasizes the achievements of the individual. This might also be traced from the myth that creativity is the act of the individual, while experience has informed us that creativity is the result of

successful collaboration between people with diverse backgrounds and points of views coming together to create a well-rounded solution. *(7)*

Many US programs now seek opportunities for collaboration between industrial design and research, industrial design and engineering, industrial design and interaction design, and so on. Sensitivity and understanding of other design disciplines should be fostered early. The successful dynamic between designers focused on different aspects of a design problem can lead to much more robust solutions. Learning about the ultimate user of the product will enhance the designers' ability to create meaningful and stimulating experiences.

Designers should also learn to collaborate across all disciplines, including business, marketing, computer science, anthropology, humanities, art, etc. A broader understanding of what it takes to make a successful product in the market will better inform designers as they approach new design problems.

5 CONCLUSION

As the global marketplace continues to mature and technology becomes less expensive, average consumers will have more choices among a vast array of new products. With these new products will come new capabilities and new scenarios of use. Interoperability between products will create complex scenarios needing expertise from diverse areas of knowledge. Designers working across disciplines will be confronted by new problems and will have to find new ways to work toward creative solutions.

China's entry into the World Trade Organization will have an impact on China's economy and its ability to compete on a global scale. In some areas, like market and user research, Mainland China companies need to be better informed to be able to create successful product strategies targeting the appropriate market. Either way, China must be prepared to face new challenges in business. Learning from established methodologies and processes from the West and inventing new approaches appropriate to the Chinese consumer can help China companies accelerate to compete internationally.

For US or European companies, while many have established methodologies on market and user research, going forward, companies need to place more importance on interdisciplinary collaboration. The next generation of designers, researchers, managers, and scientists will be faced with the challenge of developing new products to meet the increasing needs of consumers that cannot be solved in segregated disciplines. This implies that schools must adapt to these challenges as well; preparing students to work in an environment that emphasizes collaboration and creativity.

With a focus on creating a holistic experience rather than a functional or complex product, we can all be up to the challenge.

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