

Interface Issues in Everyday Products

Hartmut Ginnow-Merkert
School of Art and Design Berlin-Weissensee

1 Introduction

Contemporary household and consumer appliances, medical equipment or transportation products all have one feature in common: Their behavior is no longer cast in hardware but programmed into software. In this respect, nearly every electrically powered product may be considered an autonomous special-purpose computer with its own particular integrated cast of input and output devices.

With today's technological potential to program nearly any behavior into a product's circuitry, design has been liberated from the mechanical and material demands by which it had been ruled since the industrial revolution.

Along with this new freedom emerged a need for designers to equip their products with meaningful behaviors comprehensible to their human masters who find themselves still firmly held in their own sets of evolutionary conduct.

In today's complex universe of products, conventional industrial design – as it focuses merely on a product's *visual* appearance – no longer suffices to provide the information and guidance necessary for a product's joyous and harmonious interaction with its human counterpart. Anger, frustration and consumer abstinence are among the undesirable consequences of the designer's negligence.

Industrial design will need to operate from an interface design perspective, addressing a wealth of previously unexplored issues related to a product's interaction with humans.

2. Multisensory Interface

A product's human user will learn about the product's purpose, its functions, its operation, and its current status via multisensory interaction. The limited capabilities of the human being's five senses provide all that he or she will ever know about the product.

Far too often designers pay meticulous attention to a product's visual appearance while leaving its acoustic, tactile, gustatory and olfactory utterances to chance. Any mechanical engineer selecting materials and production processes based on an engineering set of criteria will potentially jeopardize the product's integrity as perceived by its human user. An expensive-looking toaster – to name a profane example – will suffer terminally from a cheap-sounding metallic clatter.

Therefore careful orchestration of a product's multisensory manifestations for optimum harmonious effect will become a mandatory part of the designer's business.

3. Mental Model

Virtually every product emits output available to the human being via the visual, acoustic and tactile senses. Often enough, the olfactory and gustatory senses are involved as well.

All the product's multisensory output will combine into a mental model in the user's mind. With the human mind's unrelenting effort to fabricate mental models from the observed input, designers will need to create meaningful mental models well before they begin to work on the product's visual appearance.

4. Learning Style Adaptive Interface

Based on our current knowledge about learning styles, the 'one-size-fits-all' approach to interface design is no longer justifiable. While any designer readily indulges the customer's yearning for a diversified scope of colors, sizes and

shapes, current display and interface designers limit the user's options to a singular choice of unimaginative buttons and displays. With interaction via buttons and displays playing the crucial role in customer satisfaction, such neglect results in a market mismatch with the majority of the potential clientele. A product's user interface will need to come in many colors, sizes and shapes, just like many a product's exterior. Diversified mental models will need to cater to different learning styles.

5. Dynamic Interface

Designers will soon need to develop answers to a current dilemma: While current technology is able to provide an increasing wealth of product functions at a decreasing cost, consumers are overwhelmed and frustrated with functions they can't or don't care to learn.

Yet, when given a choice between two comparable products, consumers will choose the product equipped with the greater number of functions!

Reducing the number of functions will undoubtedly speed up the learning process. But in the face of the dilemma described above, a reduced set of functions will put the manufacturer of this product at a marketing disadvantage. Furthermore, a simple interface that is quickly mastered will as quickly lead to boredom. A complex interface will overwhelm the user in the early stage of his or her familiarization with the product.

The *dynamic* interface – an interface that evolves along with and just a bit ahead of the user's knowledge of the product – will satisfy the user's needs and provide just the right challenge in every stage of the product's life cycle.

Considering recent advances in sensor design technology, designers will need to program an evolutionary quality into the product's interface.

6. Human Evolution

Humans owe most of their behavior to their four-million-year history as participants in Nature's evolutionary process. In spite of all the technology and whatever we call civilization, modern man behaves not far from his club-wielding hunter and gatherer ancestors.

Human cognitive capabilities and intelligence all were optimized for a hunter and gatherer's environment. Whether we drive a car on the freeway, turn our faces towards the elevator door or perceive visual, acoustic or tactile information about a product's value and quality all relate to mankind's past experience with the natural environment.

Human perception of value and quality follows directly the laws of Nature, many of which are yet to be discovered. A thorough study of this field will yield additional criteria to be used in product and interface design.

7. Cross-Cultural Design Issues

When using metaphors to transport meaning, metaphorical imagery typically is taken from the individual's own cultural background. Designing for foreign cultures or with metaphors taken from a foreign culture requires sensitivity and understanding as well as new methods of analysis and user testing.

Cross-cultural design bears new opportunities. Ancient traditions, wisdom passed orally from generation to generation, teachings about aesthetics based on different views of the universe (e.g. Asian monistic philosophies), and different perspectives on design derived from our studies of foreign (e.g. Chinese) language and script all will enrich the designers' spectrum of possibilities. Cross-cultural design will allow designers to break common barriers of routine thinking.

8. Closing Statement

Industrial Design and interface design will need to merge, or at least to cooperate more closely. They also need to enter into close cooperation with scientific disciplines such as Evolutionary Psychology, Psychoacoustics and Cognitive Science – to name a few.

Only by means of a combined, integrative and multidisciplinary effort will Designers continue to provide a valuable service in the development of contemporary and future products.

9 Further Reading

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