



Emerging Roles of Technology in Design

By
Michelle S. Berryman
David E. Durovy

Georgia Institute of Technology
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Birth of a Digital Nation

1937 was a year that would change the world in many ways. Men like Colin Powell and Saddam Hussein were born. George Gershwin died. Margaret Mitchell won the Pulitzer Prize for her epic novel, *Gone with the Wind*. Amelia Earhart and Fred Noonan disappeared over the Pacific Ocean. The *Hindenburg* exploded in Lakehurst, New Jersey killing thirty-eight people. The Golden Gate Bridge opened to vehicular traffic. The first U.S. Social Security payment was made. And Henry Dreyfuss designed the Model 302 rotary dial desk telephone for American Telephone and Telegraph. It became the icon for an industry. The design became a classic that is used throughout the world to this day. The youngest child, familiar with telephony, knows how to answer this phone and how to dial it. Its' silhouette transcends language and identifies public phone facilities throughout the world. That was 1937.

In 1946, Chester Gould's famous comic-strip detective, Dick Tracy, introduced America to a "miraculous" new gizmo, the two-way wrist radio. In 1964, Henry Dreyfuss redesigned the Model 302 with push buttons replacing the rotary dial. Dick Tracy was still the only guy around with a two-way wrist radio. In 1965, Maxwell Smart came into the lives and homes of America with his fantastic collection of gadgets and gizmos including the ever-popular shoe phone. But Max Smart never called Dick Tracy - only the Chief and Agent 99. During the five-years that *Get Smart* was televised, the bumbling Agent Maxwell Smart used a variety of phones. There was the pocket watch phone, the thermos phone, the eyeglasses phone, the belt phone, the necktie phone, the wallet phone and even the fire hydrant phone. But these were all fanciful creations just like Dick Tracy's wrist radio.

So, where was Henry Dreyfuss when Maxwell Smart was running around with his shoe phone? Dreyfuss was still doing design work for American Telephone and Telegraph. In 1965, AT&T introduced the Dreyfuss designed Trimline telephone. This too was destined to become a classic. In 1995, to celebrate the 30th anniversary of the Trimline telephone, AT&T commissioned a national survey to identify noted symbols of Americana. Seventy percent of those surveyed believed that the Trimline telephone deserved a place in history alongside Levi's jeans, McDonald's hamburgers and Coca-Cola. But in 1995, Dick Tracy was still the only guy in town with a two-way wrist radio.

Sometime during the late 1970s and early 1980s, America began to witness an unprecedented convergence of technology. Sony introduced the Walkman cassette player in 1979. The race to miniaturize electronics was on. The microcomputer began to permeate business, education and even the home market. People dreamed of Dick Tracy and his two-way wrist radio. In the late 1980s, Cadillac and Buick both introduced sporty, high-end automobiles that offered built in telephones as a consumer option. This was a first. Having a car phone became a sign of wealth and prestige in society. The 1990s gave birth to a whole generation of portable, cordless telephones using a variety of wireless technologies. By the end of the decade, cell phones were everywhere and they were continually getting smaller and more streamlined. The convergence of technology continued enhanced by the affordability of processing power, extended battery life, integration of advanced features and the general proliferation of technology in society. Undoubtedly, the offices of Henry Dreyfuss participated in this new telephone revolution too.

Jump ahead to January of 2001. The scene is the Consumer Electronics Show in Las Vegas, Nevada. South Korean electronics giant, Samsung unveils their new Watch Phone. Finally, the dream of Dick Tracy has become a reality. Set for consumer release over the summer, the bulky device is packed with features. It can store over two hundred numbers, has voice mail, call forwarding, caller ID, and call waiting. It has voice activated dialing, supports short text messaging and will even read the messages aloud. Dick Tracy never dreamed of features like these!

Technology Distracts the Design Community

Somewhere between the 1937 vision of Henry Dreyfuss and the 2001 reality of the Samsung Watch Phone, the design community began to lose focus. As technology and utility continued to converge in the '80s and '90s, America began to speak in a language of acronyms. The bureaucratic language of

B2B, and the e-world collided with the reduced cost of technology and features. The design of the product began to be overshadowed by the features and benefits packed into the product. Businesses pushed to have products with more bells and whistles at a lower price point than the products of competitors. Telephones suddenly had an OS. Then the OS was coupled with PCS technology. Mobile phones began to have GPS and GMS as additional features. Then mobile phones came with WWW technology and were .mp3 enabled. They began to be packaged with built-in electronic games, cameras, and video screens and calendar functions. Designers were caught in the feature war - and largely still are caught in the feature war.

Feature creep causes confusion in the marketplace among consumers. It causes confusion in the boardroom as marketers, engineers and designers struggle for the right answer with the most bells and whistles for the dollar. The underlying questions behind the confusion are difficult to answer but ignoring them will not make them go away. Adding more features and lowering the price of the product doesn't clarify the situation. What does emergent technology mean to next generation design from a product standpoint? What is the customer expectation - really? Are designers equipped to handle the integration of technology into traditional product lines? At what point is a product's functionality extended too far?

Maxwell Smart's exotic gizmos like the shoe phone had extra features but basically remained true to their intent. The shoe phone was simply that - a shoe with a phone built into the sole. The shoe was fashionable and, presumably, comfortable. The phone was a basic telephone. It made and received calls from other telephones. Dick Tracy's two-way wrist radio was a basic wrist-mounted telephone. Dick Tracy didn't need a two hundred-entry phone book or call forwarding. He just needed a small, convenient communications device. The trick for the designer is to know when to embrace added functionality, utility and features and when to let the product be what it needs to be - simple and effective.

Technology Defines New Pathways in Design

The next great Dick Tracy-style "miraculous" gizmo being proffered is the nebulous world of ubiquitous computing where fashion, product, interface, information, experience and technology collide. The challenge of simple and effective design is going to test the mettle of the design community in the coming years as ubiquitous computing is explored and defined. The potential for feature creep is an order of magnitude greater than anything experienced thus far. The opportunity for simplicity and elegance is also increased greatly.

The fashion industry has long regarded the pocket as one of the greatest innovations ever seen in clothing. Levi Strauss and Philips Research Laboratory introduced a collaborative design program known as ICD+ in September of 2000. ICD+ is a fashion experiment acknowledging the emerging market for ubiquitous computing allowing both companies to experiment with this new market. Levi's designed four different jackets, each incorporating a series of pockets with embedded wiring ready to accept and interconnect products from the Philips line such as a GSM phone, an .mp3 player, a collar mounted microphone, a remote control and earphones. The ICD+ jackets are available throughout Europe for around \$1,000.00

Scientists in Finland, working with Reima clothing manufacturer unveiled Cyberia in March of 2000. Cyberia is a prototype survival suit designed for snow-mobilers. Like ICD+, the suit incorporates a series of pockets and a wiring harness that integrate survival features with technology features such as body sensors that detect changes in temperature, impact and orientation. The sensors can automatically activate a GSM phone and a GPS beacon to send distress calls for an incapacitated wearer.

i-Wear is another European based research firm and think-tank experimenting with smart clothing. Their unique approach revolves around the concept of layering articles of apparel to create a wireless network with customizable functionality based on the number or type of clothing layers being worn. They are experimenting with clothing that responds to its environment; temperature, light, humidity, etc. so that it can become "a second skin that feels what is going on inside the body and outside in the environment and take action using that data."

The possibilities for ubiquitous computing and the industrial design community are endless, particularly if designers can break the paradigm that a “product” is a roughly six-sided affair made of molded plastic much like the Model 302 telephone. By embracing the notion that the product could be the experience of the user, or a combination of elements brought together in a unique way by a single user, it becomes clear how crucial embedded technology is to the future of design.

But when the products and technology consumers use each day are ‘embedded’ into daily life, how does one discern “design?” What does it mean to define new products by the technology they contain, rather than the form that they begin to assume? Products have traditionally been defined by volume, material, texture, and color. Maxwell Smart’s shoe phone was revolutionary because people knew that a phone was embedded into a shoe – two distinct products merged into one implement. Today, however, revolutionary means disguising the means by which products and functions merge. Manufacturers seek to provide more functionality without adding bulk and calling attention to accepted, traditional products. Wires are integrated into clothing seams; sensors become integral to product padding and packaging.

Design education continues to pass on the paradigm of products being purely three-dimensional objects that can be held and felt. Technology, however, has made possible products that are shapeless and seemingly invisible – that can not be held or felt. The .mp3 is a product, but it has no shape, no texture, no volume. It is the digital representation of an audio signal. But yet consumers seek ways to play it, to copy it, to transfer it, to take it on the go – it is just as much a product as the portable .mp3 player device on which the signal is converted to audible sound and enjoyed by the consumer. Technology has turned the notion of ‘product’ on its side. Information is now ‘designed’ and identified as a product. In fact, this is the ‘Information Age,’ as opposed to the ‘Industrial Age’ of over a century ago. So what does this mean for designers comfortable with six sided plastic products? It changes the game.

Designing the Experience of Technology

The paradigm of physical design practice and education has been shattered through the advent of products that consumers never see or touch. They may wear them, play them, view them, and dream about them, but there is no physical embodiment to be shaped. Educators familiar with the history of Industrial Design may not be prepared to wrestle with the challenges of the Information Age. Today’s students of Industrial Design, however, have grown up in the Information Age. They are tech savvy and aspire to be the next Shawn Fanning, who sent waves across the globe with a simple product called Napster, an audio file-sharing product delivered via the Internet. Napster can not be felt, touched, or placed in a shopping cart – but millions of cybercitizens considered it the most provocative product of the year 2000 and the Recording Industry of America viewed it as the biggest threat to their empire yet encountered.

Perhaps the most challenging aspect of today’s industrial design work is interpreting what type of experience a customer associates with a product. The experience of using, of wearing, of holding, of owning a product, should speak to its purpose. It should be memorable in some way. More than ever, experience, expression, and emotion, are the cornerstones of successful design. Durable, light, and ergonomic are not to be thrown aside, but rather are assumed to be a part of good design. The new challenge is to make the product seamless and transparent. ‘Thin design’ makes a mark on the user without sacrificing this seeming lack of a new product.

Design in the twenty-first century will see an increasing trend towards making products that accommodate our daily lives. They will take on many shapes and sizes – from the monumental to the microscopic. Thus, in addition to the steps a designer would already take in creating a product, it becomes necessary to craft the human interaction with a product and the interrelation the product shares with other people, products, and technologies. Integrated networks of people and devices are emerging through the rapid global proliferation of mobile telephones, PDAs, computers, and the myriad of hybrids that merge these product segments. The next exciting step design is about to take is the convergence of the human, technological, and product tracks, creating truly integrated opportunities for interaction.

The Race to be First

As in many professions, corporate constraints often curtail the creative and explorative processes natural to human beings. The rapid emergence of technology, and therefore opportunity in design, dictates that corporate managers and marketers must recognize the benefits to be gained by exploiting these situations. Designers must also be bold in their work bridging the power of product and technology. This combined effort will produce the next market-defining product.

When Maxwell Smart first used his shoe phone, few people would have thought that someday technology would make such a product feasible. Looking to imagination and fantasy today may or may not provide an accurate vision of the future, but at least it means that design is reaching for territory it has not yet crossed. By teaching alternate forms of design and promoting alternative products in the marketplace, the design professions will rise to the occasion of providing evocative products for consumers. All of this, however, is not possible without recognizing today that considerable change is required to break the paradigms in design that prevent the impossible from becoming reality.

Sadly, Henry Dreyfuss did not live to see Dick Tracy's wrist radio become an actual consumer product. Would his design approach have yielded a similar product to the one Samsung has unveiled? Who from the design community is poised to provide clear and lasting direction for the emerging field of ubiquitous computing the way Dreyfuss did for the telephone? Will today's designers embrace ubiquitous computing and produce another classic product like the Model 302 telephone? The industrial design profession must jump into this new area of product design with both feet or risk being left behind. Men like Calvin Klein, Tommy Hilfiger and Ralph Lauren are poised to get there first if the industrial design community does not act swiftly. They are not afraid of a paradigm shift.

Will the next Henry Dreyfuss please come forward?

*What ever you can do or dream you can,
begin it. Boldness has genius, power,
and magic in it.*

- Goethe

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