

Viewpoint

When You Come to a Fork in the Road, Take It: The Future of Design*

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Design began as a craft. It focused primarily on creating beautiful objects to become a powerful force in industry. Today, design has gone far beyond its simple origins in craft. Design is now developing powerful new ways for people to interact with the world. These emphasize experience rather than technology. Moreover, design has evolved into a way of thinking and problem discovery to enhance individual human lives, to vitalize the experience of work, and even to improve the health of the planet.

Are these new developments compatible with the old craft traditions? Is this a fork in the road? Will some designers continue the craft tradition of enhancing the emotional experience of products? Will others take the other path, moving design thinking into endeavors that are far removed from the history and mainstream practice of today? What is the future of design? We are at a fork in the road. Which path should we take?

Design as a Craft

Design as a skilled craft involves creating useful and beautiful items. The field of industrial design helps industry produce commercial products. In schools and universities around the world, students spend considerable time mastering the craft skills of drawing, construction, materials, manufacturing, and finishing. In many design schools, the curriculum allows little time for anything other than these crafts. There is little time spent on social issues, philosophy, world events, or general literature. There is little or no training in the fundamental STEM components of science, technology, engineering, or mathematics.

To me, these gaps are strange. Design is the interface between technology and people, yet in design education, there is little study of either. There is no deep appreciation of people or the social sciences, no deep understanding of science, mathematics, or engineering – the essential backbones of technology. The training is that of a craftsman, mentored by skilled craftspeople. It is design, design, and design.

The result is brilliant crafts capable of making the pleasurable objects we use today in our homes, schools, and workplaces. While this is excellent, craft skills alone are not sufficient for designing increasingly sophisticated technologies for home, business, education, and entertainment in the twenty-first century.

Designers who only focus on crafts can add value to products and services, but they cannot take the lead role in designing them. Engineers and business people decide what is to be done. Designers help to enable the results, but they seldom make decisions or lead design teams. Craft-based design is an admirable profession, but it is limited in aspiration and capability.

The world of technology is undergoing rapid change. Fundamental advances in the science and technology of computation, sensors, communication, and displays are driving this change, along with a growing understanding of the large social and environmental impact of modern technology. Natural resources are being depleted. In many parts of the world, the environment suffers from heavy, unhealthy pollution. Social unrest affects all of us. Even the climate is changing, with major effects on living conditions across the world. A craft education does not suffice to deal with these issues.

Design as an Evidence-Based Discipline

Traditional craft-based design had no need for formal evidence. The proof of design work was visible to all who viewed it. Design was guided by the finely honed intuition of the designer, and a discerning viewer could appreciate it. This intuitive approach worked as long as design involved such relatively simple things as watches, home appliances, and furniture.

But everything changed with the introduction of computers, communication networks, powerful sensors, and displays. At the same time, common everyday devices became more complex. People became confused and frustrated trying to use them. We needed a new form of design to cope with these issues. Intuition was no longer sufficient. It became necessary to inform design with technical know-how – and an appreciation of the limits and capabilities of the ordinary people who had to use and master the devices we designed. But the underlying operation of these devices is invisible to the people who use them. It has fallen upon the designer to make these tools understandable and usable. Traditional design training was not up to the task.

The solutions came from developments outside of design. The result, variously called “interaction design,” “experience design,” or “human-computer interaction,” came primarily through the efforts of the disciplines of psychology, human factors, ergonomics, and computer science. The Xerox Palo Alto Research Center played a major role, along with universities around the world. I entered design through

psychology and computer science. Many of the basic concepts in use today were developed between the 1940s and the 1970s. There was rapid expansion in the 1980s, as computers became widely accessible to the research community and finally available to the everyday person.

Service design was another area representing a shift in design practice. Services are not physical objects; they involve interactions between people and people or people and systems. A service is built from psychology and business, not materials, shapes, and forms. Designing services requires a different kind of knowledge than designing products. Evaluating services requires formal methods of testing. In fact, service design originated in marketing and management, not design. Only later did it migrate to design.

All these developments have been incorporated into modern design activities.

As design changed, the fundamentals changed as well. New non-design societies, conferences, and journals formed to fill the void left by conventional design. Many of the new groups brought professionals who did design together with scientists and researchers who worked on design even though they were not aware of the existing design community. We soon had human-computer interaction (HCI) and its many societies, conferences, and journals, and computer support of collaborative work (CSCW). We also had new procedures and frameworks, such as “Human-Centered Design” (HCD) and “Design Thinking.”

The result was that we developed new forms of design. Some came from groups outside of the design community. Some came from within. Today, more and more developments involve the joint work of designers and non-designers – most commonly cognitive scientists and computer scientists.

Human-centered design is perhaps the most significant of these new developments. It is a process that requires a deep understanding of people. It starts with observation and proceeds through a rigorous attempt to use those observations to determine the true underlying issues and needs. This process might be called “problem defining” – as distinct from “problem solving.”

Once the problem is defined, human-centered design begins to address the needs and issues in the problem through an iterative, evidence-based procedure of observation, ideation, prototyping, and testing. Each cycle of the iteration goes deeper and deeper into the solution space. The result is a form of incremental innovation, optimizing the solution through a hill-climbing process.

Human-centered design – at least as I define

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