The History of Microsoft Surface

The making of Microsoft's first commercially available surface computer

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Beyond the Mouse and Keyboard

Surface computing is a major advancement that moves beyond the traditional user interface to a more natural way of interacting with digital content. Microsoft Surface™, Microsoft Corp.'s first commercially available surface computer, breaks down the traditional barriers between people and technology to provide effortless interaction with all forms of digital content through natural gestures, touch and physical objects instead of a mouse and keyboard. Although customers will be able to interact with Surface in select restaurants, hotels, retail establishments and public entertainment venues by the end of the year, the product has been years in the making at Microsoft.

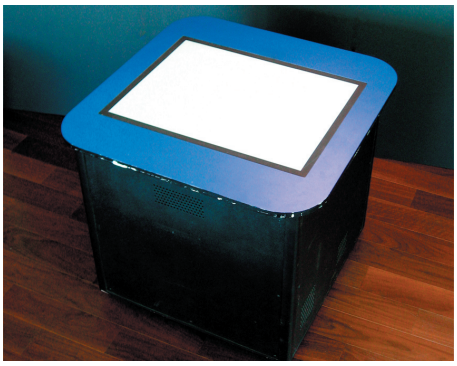
"Tub" model prototype

An Idea Inspired by Cross-Division Collaboration

In 2001, Stevie Bathiche of Microsoft Hardware and Andy Wilson of Microsoft Research began working together on various projects that took advantage of their complementary expertise in the areas of hardware and software. In one of their regular brainstorm sessions, they started talking about an idea for an interactive table that could understand the manipulation of physical pieces. Although there were related efforts happening in academia, Bathiche and Wilson saw the need for a product where the interaction was richer and more intuitive, and at the same time practical for everyone to use.

This conversation was the beginning of an idea that would later result in the development of Surface, and over the course of the following year, various people at Microsoft involved in developing new product concepts, including the gaming-specific PlayTable, continued to think through the possibilities and feasibility of the project. Then in October 2001 a virtual team was formed to fully pursue bringing the idea to the next stage of development; Bathiche and Wilson were key members of the team.

Humble Beginnings on an IKEA Table



T1 prototype

In early 2003, the team presented the idea to Bill Gates, Microsoft chairman, in a group review. Gates instantly liked the idea and encouraged the team to continue to develop their thinking. The virtual team expanded, and within a month, through constant discussion and brainstorming, the first humble prototype was born and nicknamed T1. The model was based on an IKEA table with a hole cut in the top and a sheet of architect vellum used as a diffuser. The evolution of Surface had begun. A variety of early applications were also built, including pinball, a photo browser and a video puzzle. As more applications were developed, the team saw the value of the surface computer beyond simply gaming and began to favor those applications that took advantage of the unique ability of Surface to recognize physical objects placed on the table. The team was also beginning to realize that surface computing could be applied to a number of different embodiments and form factors.

Over the next year, the team grew significantly, including the addition of Nigel Keam, initially software development lead and later architect for Surface, who was part of the development team eventually tasked with taking the product from prototype to a shipping product. Surface prototypes, functionality and applications were continually refined. More than 85 early prototypes were built for use by software developers, hardware developers and user researchers.

One of the key attributes of Surface is object recognition and the ability of objects placed on the surface to trigger different types of digital responses, including the transfer of digital content. This feature went through numerous rounds of testing and refining. The team explored various tag formats of all shapes and sizes before landing on the domino tag (used today) which is an 8-bit, three-quarter-inch-square tag that is optimal thanks to its small size.

At the same time, the original plan of using a single camera in the vision system was proving to be unreliable. After exploring a variety of options, including camera placement and different camera lens sizes, it was decided that Surface would use five cameras that would more accurately detect natural movements and gestures from the surface.

Hardware Design

By late 2004, the software development platform of Surface was well-established and attention turned to the form factor. A number of different experimental prototypes were built including "the tub" model, which was encased in a rounded plastic shell, a desk-height model with a square top and cloth-covered sides, and even a bar-height model that could be used while standing. After extensive testing and user research, the final hardware design (seen today) was finalized in 2005. Also in 2005, Wilson and Bathiche introduced the concept of surface computing in a paper for Gates' twice-yearly "Think Week," a time Gates takes to evaluate new ideas and technologies for the company.

Microsoft Surface today

From Prototype to Product

The next phase of the development of Surface focused on continuing the journey from concept to product. Although much of what would later ship as Surface was determined, there was significant work to be done to develop a market-ready product that could be scaled to mass production. "So much work goes into turning a prototype into a product that can handle the strain and stress of everyday use," Keam said. "For instance, when we developed the T1 prototype, it couldn't be moved without having to recalibrate it. Now, obviously the product can easily be moved. To get Surface to where it is today, the code had to be rewritten from the ground up."

In early 2006, Pete Thompson joined the group as general manager, tasked with driving end-to-end business and growing development and marketing. Under his leadership, the group has grown to more than 100 employees. Today Surface has become the market-ready product once only envisioned by the group, a 30-inch display in a table-like form factor that's easy for individuals or small groups to use collaboratively. The sleek, translucent surface lets people engage with Surface using touch, natural hand gestures and physical objects placed on the surface. Years in the making, Microsoft Surface is now poised to transform the way people shop, dine, entertain and live.

"Seeing Surface grow from a small germ of an idea to a working prototype and then to a full-fledged market-ready product has been an amazing journey," Wilson said. "This is a radically different user-interface experience than anything Microsoft has done before, and it's really a testament to the innovation that comes from marrying brilliance and creativity."

Beyond Surface — Surface Computing Tomorrow

Although surface computing is a new experience for consumers, over time Microsoft believes there will be a whole range of surface computing devices and the technology will become pervasive in people's lives in a variety of environments. As form factors continue to evolve, surface computing will be in any number of environments — schools, businesses, homes — and in any number of form factors — part of the countertop, the wall or the refrigerator.

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