

Microsoft Research Aims to Make Computing Ubiquitous

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Microsoft is pursuing research projects that aim to put computers into the hands of people in the remotest corners of the world to serve every aspect of their lives, according to Craig Mundie, the company's chief research and strategy officer.

Microsoft is doing research on multiple fronts aimed at bringing computing into every aspect of people's lives and improving the ways that they communicate, said Craig Mundie, the company's chief research and strategy officer, during his keynote speech at WinHEC.

On the health care front, Microsoft is experimenting with optical recognition technology that can help elderly people ensure that they are taking the correct medications at the right time, Mundie said.

Users will be able to do this by placing pills on an optical scanner screen that authenticates the dosage as being correct and at the correct time of day, he said.

Optical recognition technology can also be used to increase text size of printed mail and documents to make them easier to read, Mundie said. For example, a person with poor eyesight could place a postcard on a screen that greatly magnifies the text, he said.

Microsoft is also doing research on ways to use cell phones and similar devices to help illiterate people perform significant tasks through video and icons. Such research is particularly important in developing nations

where most people only get access to computing power by buying cell phones, he said.

Mundie used as an example an illiterate woman in a village with a sick child and a cell phone. With the aid of voice prompts, videos and icons, she could to give information about who was ill and what the symptoms were.

"This data could then be sent to the medical facility in the village, which then responds and gives her further directions," Mundie said.

Microsoft is playing its part in helping make these scenarios possible through its research and through its Unlimited Potential initiative, which it recently expanded to include a software package, the Student Innovation Suite, available to governments and students in emerging countries across the world at a price of just \$3.

There are 2 billion people coming online using a variety of available devices who have small disposable incomes and need more affordable products than currently available, Mundie said.

Microsoft Research is also working on how to make cell phones function more like computers. The research project, known as Phone Plus, is looking at ways to attach keyboards, he said.

The form factors of microprocessors are also continuing to evolve, but transistor clock rates aren't going to continue to increase indefinitely, Mundie said, so heterogeneous multicore processors are the order of the day, something Microsoft Research has long been working on.

A modular, heterogeneous multiprocessor system-on-a-chip is the technology of the future, but the challenge lies in overcoming concurrency and complexity as systems became far more distributed but

also parallel and asynchronous, he said.

"Many new techniques are going to have to be brought forward that are loosely coupled, asynchronous, concurrent, composable, decentralized and resilient. A great deal more constructive thinking is going to have to be done around how we build these systems in the future," Mundie said.

The technical challenges include constructing parallel programs, coordinating resources and services, executing fine-grained programs and building applications, he said.

"I would like to see fully productive computing that is predictable, humanistic, context-aware, model-based, personalized, adaptive and immersive. This will enter at the desktop and then increasingly go more portable and mobile," he said.

"We were in the middle of a swing between centralized computing and computing at the edge. I think for the first time in a long while there will be a balance between centralized and personal computing," Mundie concluded.

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