'Simputer' aims at the Developing World

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In a bid to take information technology to the masses in India and other developing countries, academics and students from the Indian Institute of Science (IISc) at Bangalore, and engineers from Bangalore-based design company Encore Software Ltd., have designed in their spare time a sub-$200 handheld Internet appliance.

Called the Simputer, for SIMple ComPUTER, the device is the first handheld Internet appliance to have been designed entirely in India from the electronics to the software to the industrial engineering for the housing of the device.

"We expect to change the model for the proliferation of information technology in India," said Professor Swami Manohar, professor in the computer science and automation department of the IISc. "The current PC-centric model is not sustainable because of the high cost of the PC, and also because we expect that most of the users will not be literate."

The intellectual property for the device has been transferred free to a non-profit trust, called the Simputer Trust, and both the software and the hardware for the appliance have been offered as open source technology. In the open source model of development, users and developers, often unpaid, work together to update technology.

Manohar said that the trust decided to put the technology in Open Source to enable third party software developers and designers to add value to the platform. The prototype of the appliance will be available in August this year. The Simputer Trust is working with the Indian Institute of Management at Bangalore to identify applications that will drive the acceptance of this appliance in rural India.

The technology for the product will be licensed to manufacturers at a nominal fee of US$1,150, which is to be used to finance upgrades to the Simputer. Under the open source program, said Manohar, manufacturers can make extensions to the design, but the modifications have to be turned in to the trust, and made available to the community of developers and designers.

A number of large manufacturers have shown interest in licensing the technology, though the interest is currently confined to Indian companies, according to Vinay Deshpande, chairman of Encore and a member of the Simputer Trust.

Built around Intel's StrongARM CPU, with Linux as the operating system, the Simputer will have 16M bytes of flash memory, a monochrome liquid crystal display (LCD) with a touch panel overlay for pen-based computing, and a local-language interface. The appliance will have IrDA (Infrared Data Association) and Universal Serial Bus (USB) interfaces. While the first prototype of the product will offer a modem for only only fixed telephone line connectivity, later versions will also offer wireless technology.

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The Simputer will also support popular network protocols such as TCP/IP (Transmission Control Protocol/Internet Protocol) and FTP (file transfer protocol). The initial version will feature Internet access and mail software such as a micro browser supporting Information Markup Language (IML), an extension of Extensible Markup Language (XML) for handheld computing. The basic software applications on the device will be offered free. While the hardware was designed by Encore engineers, the software development and the product packaging was done at the IISc.

A subsequent version of the Simputer will also offer speech recognition for basic navigation through the software menus, said Manohar. The speech dictionary will be customizable to support different languages. A text-to-speech system will also be developed, in line with the Trust's objective to take the technology to India's illiterate population.

Deshpande said that the designers have been able to achieve the sub-$200 price point since the electronic components used in the device are all off-the-shelf volume components, and the software is primarily open source software such as Linux and Kaffe, a public-domain version of the Java Virtual Machine -- software that allows hardware to run applications developed with the Java language. The designers have also saved considerably on licensing costs by doing the designing themselves.

The trust will publish the application programming interfaces (APIs) of the device to enable commercial and non-commercial software development around the platform. To spur software development around the device, a Simputer simulator and software development kit will be made available free to developers.

The designers expect the Simputer to be used not only as a personal Internet access device, but by communities of users using these devices at kiosks. A smart-card interface to the device will enable the use of the device for applications such as micro-banking. The device is also likely to be used for data collection. The Trust plans to work with government, banks, and non-governmental organizations (NGOs) to build the infrastructure required for these applications.

The Computer Science Department of the Indian Institute of Science in Bangalore can be reached at http://www.csa.iisc.ernet.in Encore Software Limited is at http://www.ncoretech.com

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