One Laptop Project reaches critical stages

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The One Laptop Per Child project, an effort spearheaded by the Massachusetts Institute of Technology's Media Laboratory and joined by several corporate partners and international governments, has moved closer to completion. The effort, which is intended to provide tens of millions of children in developing nations with laptop computers, has reached several of its goals with full manufacturing and distribution of the units due in about 12 months time.

The project finds its roots within the constructionist theories of Seymour Papert, which focus on the idea of learning by doing and ties it in with technologies. The laptops, which are to be manufactured and distributed to the governments of various nations, will provide a set of tools that

would otherwise be unavailable to these students.

Having received $20 million in donations from its partners for initial manufacturing and production, the One Laptop Per Child program becomes a self-sustaining economic model by selling the laptops at $100 per unit to the countries that wish to purchase them and gradually turns a profit as the cost of production declines. The One Laptop Per Child group, which has been established as a non-profit organization to further the effort over multiple years and generations of hardware (including a potentially more full featured $200 commercial laptop in the future) will take a small percentage of the proceeds to cover costs.

The current design of the machines, which feature about 25 percent of the parts of a standard laptop computer, includes a 500 MHz AMD processor, 128 megabytes of RAM, a 500 megabyte Flash-based memory drive, Linux-based operating system and dual mode display capable of acting as both a brightly lit color LCD monitor as well as a contrasted black and white reader capable of clearly displaying text in direct sunlight. The units will also feature dual power supplies in the form of a standard AC connector as well as a small kinetic crank on the side of the machine that can be turned to build a charge in locations where electricity might be unavailable or unreliable.

Networking will move towards future standards with these laptops, which will feature both the 802.11 wireless protocol seen in many wireless systems today as well as mesh networking, which seeks out similar units and establishes network connections in the background. These connections allow even a single Internet connection to be shared and distributed among several laptops with software configuration being handled in the background without assistance from the user.

With the laptops eventually going into the hands of children, durability has become tantamount. The units are currently going through

ruggedness and stability testing according to Professor Nicholas Negroponte, chairman of the One Laptop Per Child project. Here, the units are subjected to almost every imaginable stressor that could occur in the hands of children, such as standard rough and tumble abuse, blowing dust into the components, dunking it in water and even pouring dust into the hinges.

"There's a whole subculture of people that submit things like this to tests to make sure we have the most rugged object," said Negroponte.

Since security and the potential for theft have become concerns with the units, its designers having decided to approach the problem from multiple angles. Nicknamed "The Green Machine" due to its distinctive lime-green color, the design discourages theft in the developing countries the units will be sent to and makes the item distinctly identifiable.

"In South Africa, believe it or not, there are no stolen white Volvos, zero, because there's no market for stolen white Volvos. But there are lots of stolen Mercedes," said Negroponte. "How do we make this into a white Volvo?"

Digital methods are also being considered for theft prevention. The laptops, which communicate wirelessly with each other, can be configured to deactivate if they haven't been turned on and in contact with other units, as they would in a school environment.

Distribution of the units will begin with India, China, Thailand, Egypt, Nigeria, Argentina and Brazil, which have all ordered at least one million units in advance. The units will be distributed to local government bodies that will then decide how best to pass the machines out and develop a curriculum for them. Possible corruption, shrinkage and mishandling of the units can be tapered off by the nations wishing to make the effort a

success and succeed in international competition with each other.

Oddly enough, localized support for the units will take place with the kids themselves. The operating system, which will be transparent, will feature some electronic help while the kids will learn via hands on experience and assist each other. Where fixes need to be made, the units will be built in a modular fashion for easy replacement and an active open source software development community is in the works to provide software for these laptops so that fixes and additional instructions can be retrieved from the Internet.

"We're not tapping into how much of a resource that we have in the world. 1 in 100 kids is probably a hacker kid," said Mary Lou Jepson, chief technology officer of the One Laptop Per Laptop project. "The kid who fixes cars might have the same inclination or find something, but we're missing the talent pool right now and there's no excuse any more."

And even if some shrinkage or corruption does occur, there remains potential for success.

"Suppose that 90 percent of the machines are used in some improper way or aren't used, so the remaining 10 percent are used for real education. And suppose that of that 10 percent, 1 percent are used by individual kids who become fascinated with the technology who become entrepreneurial innovators," said Professor Emeritus Seymour Papert. "1 percent of a country with 10 million people. 100,000 people. 100,000 savvy, sophisticated people can transform the economy of a small country.... there's no lack of critical mass to make this happen to even a small proportion."

Full production of the initial batch of units will take place next February with a 90 percent hardware freeze of the final design due to be set by late March or early April.