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## OLPC: Revolutionizing the way to make education affordable for everyone

Going beyond the status quo - creating bigger, better,  
bolder, faster and cheaper solutions

*By Hitendra Patel, Julius Bautista and Ronald Jonash*

*"You've got to break the cycle. You can't continue to just give. If people can do it themselves, they can break the cycle. And education is the backbone that will do that."*

*- Charles Kane, Board Director and former President*

*One Laptop Per Child*



**Revolutionizing the way to make education affordable for everyone**

*Going beyond the status quo - creating bigger, better, bolder, faster and cheaper solutions*

**OLPC wanted to provide the world’s poorest children with education ..... 3**

A billion children in the developing world do not get an adequate education  
 OLPC’s goal has been to educate the world’s poorest children through a laptop  
 OLPC wanted to operate as a self-sustaining business  
 OLPC distributed laptops through national governments but had not found it easy  
 OLPC had driven costs down but other viable competitive solutions have emerged  
 OLPC had used a range of techniques to deploy 2.5 million laptops successfully



**However, this is not enough and OLPC needs new and better solutions across its value chain to reach 10 million children in 5 years ..... 10**

- Are there new markets to target?
- Are there new ways to deliver?
- Are there new offerings that OLPC can provide?
- Are there new ways to produce the offering?
- Are there new business models that will sustain OLPC?



**Can OLPC get 10 million laptops to children in 5 years, drive the industry to make laptops more affordable, and improve education with its principles? ..... 12**



## One Laptop Per Child (OLPC) wants to provide the world's poorest children with education

Bonair Sabamungu is a 13 year old boy from Rwanda. He has had his XO laptop for a couple of months and he has already discovered many things. On the XO screen, you can see him looking at a map of Africa. He uses his laptop to “see the story of my country, the story of the presidents of Africa and America” as he puts it. He was intimidated by the computer at first but now handles it with confidence. He and his classmates are now learning at a faster pace. With the laptop comes hope for a better future for Bonair and for Rwanda.

as Marvell, eBay, Brightstar, Quanta, Nortel, Chi Lin, News Corp, AMD, Google and Red Hat, OLPC was off to a great start and generated excitement among business leaders and the media.<sup>3</sup>

### OLPC's solution drove self-learning, collaboration and co-teaching

*The XO computers were low-cost, low-power, rugged and easy to maintain*

The laptop or XO-1 was built with several goals in mind. First, it needed to survive extreme weather conditions such as extreme heat, humidity, high altitudes and children who might accidentally drop it or spill liquid on it.<sup>4</sup> With this in mind, the casing was thicker with rounded edges. Flash memory replaced the hard drive eliminating the need for a fan to cool the drive. Additionally, the USB, sound and power ports were covered with antennas to keep dust particles or other substances from entering the machine.

Second, OLPC cut manufacturing costs where it could to reach the \$100 price-point. OLPC's former Chief Technology Officer Mary Lou Jepsen, who had directed the technology development at Intel's Display Division, led the development of the XO's LCD screen that had cost only \$40.10. The laptop also used a free, slimmed down version of Fedora Linux, the open source operating system, with a graphical user interface (GUI) called Sugar.<sup>5</sup> OLPC decided to outsource manufacturing to Quanta Computer, Inc., a Taiwan-based company that manufactured laptops for Dell, Lenovo and Hewlett Packard. OLPC intended to sell the XOs in lot sizes of one million units.

Third, the XO-1 was intended for use in remote areas so it was designed for easy field repair. Children would be able to take it apart and replace components on their own.<sup>6</sup> Energy efficiency was also considered in development, relying on low power components such as an LCD screen which could adjust for use in open areas in broad daylight and used 80% less power than conventional screens.

The laptop has two antennas for wireless connectivity<sup>7</sup>, allowing the antennas to connect computers as far apart as 5 kilometers in a flat desert or a few hundred meters apart in a city environment.<sup>8</sup>

In 2009, OLPC started producing the XO-1.5, incorporating a few improvements. It had more memory (4GB as opposed to the original 1GB), a more responsive keyboard and touchpad and a battery that charged faster and shut down more efficiently to extend use and battery life.<sup>9</sup>

### A billion children in the developing world do not get an adequate education

In order to become productive individuals, children must be equipped with the necessary tools to function in society, especially the rapidly changing environment of the 21st century. Education is the foundation that can provide those tools. However, over half of the world's children in developing countries (56%)—just over one billion children—are severely deprived. These children suffer from one or more forms of severe deprivation of basic human needs, including food, water, shelter and education. Getting a good standard education has been a challenge for most children in developing countries. According to the 2011 UN Millennium Development Goals Report, about 67 million children of primary school age were not in school; this is not counting those children who are enrolled but not attending school. Most of these children are from poorer households in rural areas. Even when enrolled in school, these children lack the materials that the developed world's children have to complete their education.

### OLPC's goal has been to educate the world's poorest children through a laptop

#### OLPC's mission was to improve the education of these children through portable computers

In 2005, Nicholas Negroponte announced the idea of OLPC, a new non-profit organization at the World Economic Forum in Davos, Switzerland and introduced a prototype of the XO computer—a laptop that would be priced at \$100 and would transform the way children learn all over the developing world. OLPC aimed to get this laptop to every child for use in the classroom and in daily life. (This is often referred to as the “1:1” laptop program).

With \$29 million in funding, raised from a wide range of high-profile technology companies, such

#### A Description of the XO's Functionality

OLPC's XO laptop offers a cohesive integrated software platform. The special features, such as a built-in video camera, high-resolution screen, longer battery life, and pull-string charging makes it enjoyable and easy-to-use for children of all ages.

OLPC's XO laptop includes a long-lasting nickel-metal hydride battery that allows the XO to operate between 6 and 20 hours depending on features in use. When power sockets aren't available, users can recharge the battery with a built-in pull-string charger. The XO laptop also provides network access with a unique wireless mesh network technology and includes a built-in microphone and an integrated camera that can capture video at 30 frames per second with a resolution of 640x480. The laptop has a directional pad and game buttons integrated into the screen bezel in addition to a rubber-membrane keyboard and a touchpad that supports stylus input.

The laptop-user interface, the software that children navigate to interact with the computer, is called Sugar. Based on the Linux operating system, Sugar is designed to encourage social interaction and collaboration and is currently offered in 25 languages. It starts with a range of activities, not programs, and promotes the sharing of these activities both online and through the physical interaction a child has with the computer. Nicholas Negroponte describes it as “active learning.” The system includes a built-in chat system as well as a web browser based on Mozilla Firefox, providing opportunities for communication with and exposure to the global world.

The next generation of OLPC's XO, the XO-3 tablet, has been introduced at the CES 2012 event in Las Vegas.

#### Source:

Tablet OLPC for Just \$75,” *Wired*, December 23, 2009, <http://www.wired.com/gadgetlab/2009/12/xo-3-concept-a-crazy-thin-tablet-olpc-for-just-75/>, accessed December 19, 2011 and Ryan Paul, “A comparison of OLPC's XO laptop and Intel's Classmate PC,” *ars technica*, March 5, 2007, <http://arstechnica.com/old/content/2007/03/acomparison-of-olpcs-xo-laptop-and-intels-classmate-pc.ars>, accessed December 19, 2011; “Marvell, OLPC Introduce “One Laptop Per Child”, *PCMag.com*, January 7, 2012, accessed January 9, 2012.



*The Sugar software platform allowed children to explore, create and share with each other*

In 2007, Red Hat contributed a compact version of its Linux-based Fedora operating system which was used to build Sugar.<sup>10</sup> Red Hat and OLPC software engineers, together with help from the open source community, developed the software. Linux and Sugar required less disk space than other operating systems—it can run on a 2GB USB flash drive<sup>11</sup> (See table 1 for specifications). The XO GUI was specifically designed to be intuitive to children. Rather than the typical subject/folder organization of Windows OS, the XO GUI was chronologically organized like a journal, where users could more easily find the work they had done on Monday or Wednesday, for example.<sup>12</sup>

All of the programs or “applications” in Sugar are based on Constructionism theories developed by Seymour Papert. This means that all applications, activated under the “Activities” menu, are designed so that children learn by exploring and expressing, rather than memorizing concepts.<sup>13</sup> The XO ships with a default set of applications such as *TamTamEdit*, *Chat*, *Record* and *Pippy*.<sup>14</sup>

*TamTamEdit* allows kids to compose music by creating, organizing and modifying notes into tunes which they can then play back and share. *Chat* allows the kids to talk to each other, either in pairs or to the whole classroom. *Record* provides a way to save multimedia content—pictures, audio, video—that can also be shared with

others. *Pippy* introduces the kids to programming in Python, the language Sugar was built on.

Because Sugar and all the other software are open-source, children and others are free to modify current applications as well as create new ones. This setup has spurred the creation of a community of developers (mostly children) who share new activities and games for others in the world to use.

Currently, development of Sugar is continued at Sugar Labs and led by Walter Bender, OLPC co-founder and creator of Sugar. Sugar runs not only on the XO laptops but also on other PCs as well.<sup>15</sup>

*Each laptop was customized by language and local cultural content*

In every deployment, OLPC can pre-load local content beyond the laptop’s default content distribution. The specific localized content, defined by the customer, includes additional activities, electronic books, texts, music, Internet browser bookmarks, maps, dictionaries and language translations.<sup>18</sup>

For example, OLPC Canada adds eight additional activities and around 100 electronic books, some written by aboriginal authors,<sup>19</sup> targeted towards aboriginal youth.<sup>20</sup> In Afghanistan, the XOs have a Pashto and Dari keyboard and the Quran, national anthem and some Afghan curricula pre-loaded.<sup>21</sup>

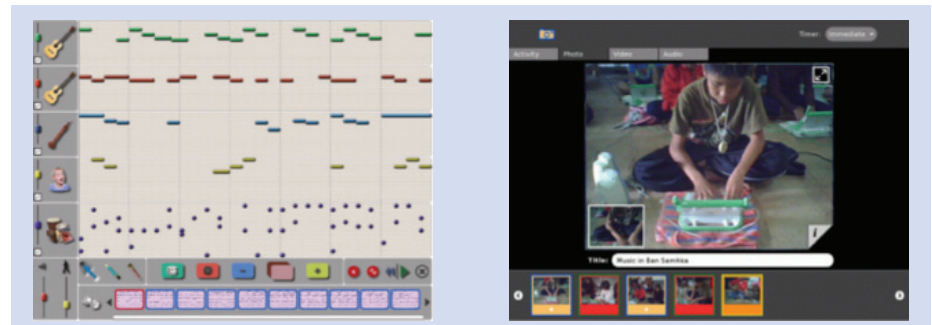


Figure 1. Examples of Sugar Applications - TamTamEdit and Record<sup>16</sup>

Table 1. Sugar Specifications<sup>17</sup>

Specifications	Description
Developer	Sugar Labs
Stable release	0.94 / September 2011
Programming language	Python
Operating System Platform	Linux
Licensing	Open Source
Compatibility	XO laptop, Linux, Windows, MacOS
Ways to install	Built-in, bootable CD, USB stick
Minimum hardware specifications	400Mhz or faster processor, 768 MB Ram, 2 GB disk space

**To ensure sustainability, OLPC helped build an ecosystem around their solution**

*Training for parents, teachers, maintenance providers and education administrators was provided*

Beyond introducing these devices to children, many teachers also had to be persuaded to bring them into the classroom. Even once in the classroom, the acceptance of XOs still depends upon such key variables as: teacher capacity, the methods of introduction (e.g. if XOs are requested vs. mandated from outside organizations such as a Ministry of Education) and others.

While the XO appealed to forward-thinking government officials as well as to students who were curious about the new technology, teachers sometimes represented an unanticipated obstacle to adoption. Many teachers were unfamiliar with computers and had never integrated them into their classroom efforts. Suddenly, there were pressures from above and below for the laptops. Authorities such as governments had invested (or were interested in investing) in the XOs as a solution to improve education. On the other side, children almost always react positively to the XO and often learn to use them and incorporate them into their classroom learnings more quickly than the teacher. This adds a new dimension to the classroom: children's adoption of the XOs risked undermining the teacher's authority as they became more familiar with the technology than the teacher. Part of the educational outcome of the XO was to help foster independent learning.<sup>22</sup>

Therefore, teacher buy-in was critical to the OLPC initiative's success. In order to gain teacher buy-in, OLPC incorporated teacher training as a way to build their capacity and capability in using the XO in the classroom. In every deployment, OLPC provides one to two weeks of training to teachers every three months, depending on the number of teachers involved.<sup>23</sup> OLPC also partnered with the "Ceibal" program in Uruguay to provide teacher training in Rwanda and Armenia.<sup>24</sup>

OLPC also introduced the laptop to parents and other adults in the community to ensure their comfort with technology and their support of the children in this initiative. OLPC helps with the maintenance of the laptops in three ways: the children are taught to repair the laptops (See Figure 2); third party facilities are set up to repair the laptops; and individual technicians, trained in laptop repair, visit the schools on a regular basis to check on the laptops.<sup>25</sup>

*Installation guides for power grids and Internet connectivity were provided*

Some of the concerns surrounding the laptop focused on the infrastructure needed for the laptop to function in remote areas where there is not enough power or connectivity.

While conventional laptops require 20 to 40 watts of power, the XO was designed to run on two watts in e-book mode and five watts on average.<sup>27</sup> At these levels, the XO can be used with alternative energy sources, such as solar or human-generated power. This very low use of energy put less stress on existing infrastructure. OLPC currently offers solar panel solutions that could power individual laptops, and the organization is working on designs that could power multiple laptops at one time.

In Peru, some effective responses to telecommunication and energy infrastructure concerns were relatively inexpensive. In some remote villages in mountainous areas, for example, a satellite dish made conventional telephone wires unnecessary. Also, solar panels were installed at the schools in order to provide the power necessary to run the XOs in remote locations.<sup>28</sup>

The XO was also designed to be a collaborative tool for teachers and children, so it had a built-in mesh network that enabled machines to connect to each other without a standard network infrastructure.



**Figure 2.** Kids fixing XO laptops<sup>26</sup>

**OLPC wanted to operate as a self-sustaining business**

**OLPC added leadership to run the business**

In May 2008 Charles Kane joined the OLPC leadership. Kane, who had held a series of high-level positions in the technology industry, brought business expertise to OLPC. As Kane put it, “Profit and high ideas are not a contradiction: we use the profit for good ends, but we need a sustainable business.”<sup>29</sup>

**OLPC split operations to achieve focus**

OLPC started to reorganize itself and split into two in 2009: the OLPC Foundation and the OLPC Association (See Figure 3). Based in Cambridge, Massachusetts, the Foundation, headed by Negroponte, continued to focus on fundraising, and developing the next generation of XOs, such as the XO tablet. The Association, on the other hand, headed by Rodrigo Arboleda Halaby, focused on the business end—selling to customers and deploying the XOs.<sup>30</sup> Arboleda had worked with Negroponte since 1982 on related projects to improve education in developing countries. The Association was based in Miami, Florida, in order to be closer to its major customers in South America.

the logical channel to target. Given that national public education decisions lay with them and they had authority to approve the funds for large scale purchases of XOs, OLPC needed them to provide the scale to sustain the organization.<sup>31</sup>

**However, overly bureaucratic governments were not open to OLPC-type solutions**

*Projects were delayed or abandoned because of high turnover and inefficiencies*

Bureaucratic inefficiencies were a significant barrier in many of the developing countries where OLPC hoped to make an impact. Governments typically take time to implement a program, sometimes taking months from the time the program is approved. Additionally, government officials are subject to frequent turnover due to elections or reappointments. OLPC efforts are put at risk when an official who advocates for the program leaves before contracts are signed, deployments begin, or the program has proven to have educational benefits.

*Some government officials thought there were better or cheaper alternatives to improve the quality of education*

Because the laptops sold for \$188 instead of the targeted \$100 (and because of OLPC’s one-to-one policy), implementing a program in one school, much less an entire country, involved a high initial cost to the government, not to mention covering the secondary implementation costs such as infrastructure (setting up networks and ample power sources), training and maintenance. Some government officials contend that their money is better spent on other things that can also directly improve education, such as building classrooms and purchasing books and school materials.

**The Education Minister in Nigeria was not convinced laptops were the answer**

According to a BBC report, in 2007, Nigeria expressed interest in 1 million laptops. However, the then Education Minister, Dr. Igwe Aja –Nwachukwu mentioned educational needs that needed to be addressed first before the laptops could become successful. “What is essential to introduce one laptop per child...whether the kids will have seats to sit on, uniforms to wear, facilities to use...”

Source:

[http://www.youtube.com/watch?v=ZbV0kbfY\\_18&feature=related](http://www.youtube.com/watch?v=ZbV0kbfY_18&feature=related), accessed December 19, 2011

**OLPC distributed laptops through national governments but had not found it easy**

**Governments provided access to the most number of children and helped scale the organization**

To date, OLPC primarily targeted governments, particularly the ministries of education who then distributed the laptops schools on a one-to-one basis. OLPC reasoned that governments were

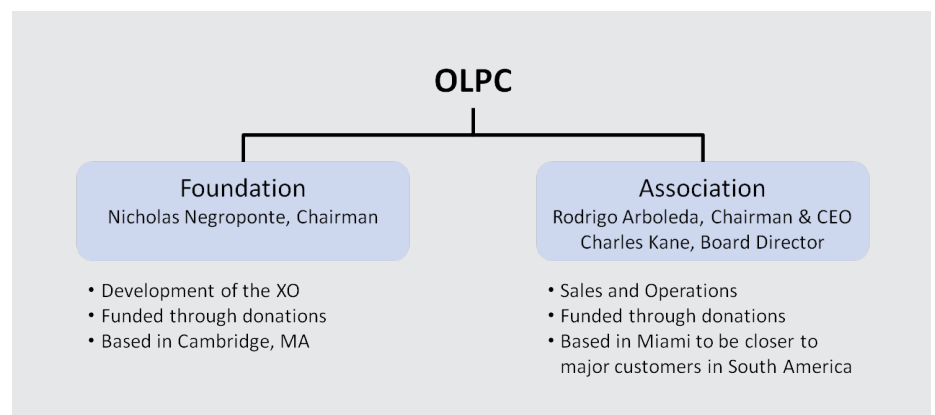


Figure 3. The OLPC Organization

**OLPC had driven costs down but other viable competitive solutions have emerged**

There are four types of devices that have emerged as competition for the XO laptop: netbooks, mobile phones, the Intel classmate (see Table 2 for comparison), and the Aakash tablet.

**Netbooks had similar hardware to XOs but were not built for harsh environments**



The XO was instrumental in jumpstarting the

netbook market. However, while netbooks are smaller and cheaper than laptops, most netbooks are unable to withstand the physical wear and tear they would receive from pupils and the generally harsh environments they would be subjected to in developing country classrooms; therefore, they have not emerged as true competitors.

**Mobile phones had similar software but had a small form factor**

Many other devices possessed characteristics similar to those of the XO. Cell phones could

**Table 2.** Feature Comparison between the XO 1.5 and Classmate

	<b>OLPC XO 1.5</b>	<b>Intel Classmate PC</b>
		
<b>Distribution</b>	By 2011, XO deployments have reached 2.5 million the majority of which are in Uruguay, Rwanda, and Peru.	There are about 4 million Classmates that are in circulation worldwide mostly in Europe and Latin America, particularly in Portugal and Venezuela.
<b>Price</b>	around \$200	around \$200 - \$400
<b>Processor</b>	Via C7-M (1 GHz) ULV CPU	Intel® Atom™ Processor N270 at 1.6GHz
<b>Display</b>	7-1/2 inch dual-mode LCD, supporting a resolution of 1200x900 in monochrome mode and 800x600 in color mode	8.9" 1024 x 600 touch screen, Convertible: traditional or touch-optimized tablet mode
<b>Memory</b>	1 GByte DDR2 SDRAM system memory	1 GB / 512MB DDR2 256M (Linux only) or 512M SO-DIMM
<b>Storage</b>	4 GBytes of NAND Flash memory on motherboard, 1 MByte of serial Flash memory provided separately for firmware; Expandable through a single externally accessible SD/MMC memory card socket	16G/8G/4G Flash or 1.8" HDD
<b>Operating System</b>	Linux, Windows, Sugar interface	Windows or Linux
<b>Weight</b>	1.45-1.58 kg (3.2 - 3.5 pounds)	1.25-1.49 kg (2.8 - 3.3 pounds)
<b>Camera</b>	Integrated color video camera 640x480 resolution Full frame rate (30fps)	Integrated color video camera 640x480 resolution Full frame rate (30fps)
<b>Network</b>	Integrated IEEE 802.11/b/g (2.4 GHz) wireless networking interface; Ad-hoc and AP mode networking supported; Capable of network operation when CPU is powered down	10/100M Ethernet WLAN 802.11b/g/n WLAN with antenna, Mesh support (Linux only), Security: WPA, WPA-PSK, WPA2, WPA2-PSK
<b>Keyboard</b>	Water and dust proof 80+ key rubber keyboard, with 1mm stroke Capacitive touchpad used for pointing device	Water-resistant keyboard, Touch pad (integrated vertical scrolling)
<b>Other features</b>	Directional pad, games buttons integrated into the screen bezel; rubber-membrane keyboard; touchpad supporting stylus input	speakers and microphone; an optional wireless pen device
<b>Battery</b>	Nickel-metal hydride, supporting between 6 and 20 hours operating	6-cell battery (6 hours) or 4-cell battery (4 hours), based on 8.9" LCD and defined brightness, Wi-Fi off, and camera disabled

### President Paul Kagame drives OLPC Rwanda

As part of Rwanda's Vision 2020 campaign, the country has begun embracing information technology as their main strategy for economic and social development. This is Rwanda's long-term development plan that aims to transform the country into a medium-level income country by 2020. Even before OLPC started their project in Rwanda in January of 2007, bringing computer literacy to primary school students was an important part of Rwanda's Vision 2020.

President Paul Kagame has committed to deploying 120,000 laptops across the country. This is partly supported by collaboration between the wealthier city schools and the poorer rural schools. OLPC has also set up a major learning center in Rwanda, the Center for Laptops and Learning, which aims to serve the educational and learning needs of countries across Africa. With Kagame's leadership the program has had some success and serves as an example that encourages other African countries such as Mali to follow suit.

Source:

<http://laptop.org/en/children/countries/rwanda.shtml>, accessed November 3, 2011

also connect to the Internet and were cheaper than laptops. Smartphones, a subset of the mobile phone industry, might be more expensive than cellphones, but they operated similar to a small computer, with software similar to the XOs, such as chat, e-readers and more. However, mobile phones may not be a good platform for education given their small form factor.

### The Intel Classmate was a direct competitor with characteristics similar to the XO

But there are some direct competitors. Intel, whose Intel Classmate launched in May 2006, was a viable alternative to the XO. Intel saw developing countries as a potential opportunity for growth, thus was interested in making a play in the same markets as those OLPC was in. (See Table 2 in the previous page for comparisons)

### The Aakash tablet was another direct competitor already spreading in India

In India, Aakash, a low-cost, Android-based tablet was developed by the Indian Institute of Technology in partnership with DataWind.<sup>32</sup> The tablet is seen as a way to access the one billion people in India who are left out of the digital age and to improve education by linking India's 25,000 colleges and 500 universities.<sup>33</sup> The Indian government is procuring 100,000 tablets at a cost of \$48 and would order more if the initiative proves successful.<sup>34</sup> Aakash's commercial version, called Ubislate 7, would be available for purchase in January 2012.

### OLPC had used a range of techniques to deploy 2.5 million laptops successfully

OLPC has leveraged powerful champions such as Rwandan President Paul Kagame, lead countries such as Uruguay, pilot programs such as the one in Arahauay, Peru and alternate donor programs such as the Give One Get One (G1G1) to successfully bring 2.5 million laptops to children around the world.

### Found powerful individuals to champion the program

OLPC tries to build close relationships with major government players who understand how to champion OLPC's offering through their government's bureaucracy. Because many of these governments are relatively centralized, getting buy-in from a high placed government official is a very helpful first step.

### Focused on lead countries to influence a whole region

Uruguay has committed and succeeded in reaching one-to-one saturation in all public school systems. Peru embarked on a similar objective and has actually passed Uruguay as the largest deployment of XOs worldwide. Large regional successes—their experiences and publicity—spurs XO adoption in nearby regions. By demonstrating success in Uruguay, for example, Peru and Argentina were encouraged to give the XO a try. OLPC's experience in Rwanda and Uruguay illustrates a key success factor for OLPC: creating successful relationships with lead customers in global regions.

### Uruguay's "Plan Ceibal" serves as an inspiration for others

Uruguay represented the first large-scale governmental buy-in to reach 1:1. It was called the "Plan Ceibal" — "Ceibal" being the national flower of Uruguay as well an acronym for the project (Conectividad Educativa de Informática Básica para el Aprendizaje en Línea). President Tabaré Vázquez was very enthusiastic about the XO's potential role in the education of Uruguay's citizens and publicly announced the plan in December of 2006. With about 400,000 units included, this plan represented the largest purchase by a single country of the XO laptops until it was passed by Peru. With this purchase, Uruguay has given every child in public education between 1st and 6th grade, as well as all of their teachers, one XO laptop.

By 2009, around 70% of the XO model laptops were given to children who did not have computers at home. The director of the Plan Ceibal, Miguel Brechner, described the goals of the program: "This is not simply the handing out of laptops or an education program. It is a program which seeks to reduce the gap between the digital world and the world of knowledge." In one of many encouraging signs about the Plan Ceibal, the government reported in 2009 that close to 80% of economically disadvantaged children said that using the XOs made classroom assignments more enjoyable. Success in Uruguay is making neighboring states, such as Argentina and Peru, more enthusiastic about OLPC's mission. Argentina, the La Rioja Province, purchased 60,000 XO laptops in 2010 and the Peru signed on to purchase 260,000 XOs in 2007.

Sources:

<https://edutechdebate.org/olpc-in-south-america/olpc-in-uruguay-impressions-of-plan-ceibal/>, accessed November 3, 2011; <http://news.bbc.co.uk/2/hi/8309583.stm>, accessed November 3, 2011 Ingacio Salmano et al., "Monitoreo y evaluacion educativa del Plan Ceibal," p. 14, Plan Ceibal web site, [http://www.ceibal.org.uy/docs/presentacion\\_impacto\\_social221209.pdf](http://www.ceibal.org.uy/docs/presentacion_impacto_social221209.pdf), accessed November 3, 2011; "Peru signs up for 260,000 OLPC laptops", [http://news.cnet.com/Peru-signs-up-for-260,000-OLPC-laptops/2110-11746\\_3-6221061.html](http://news.cnet.com/Peru-signs-up-for-260,000-OLPC-laptops/2110-11746_3-6221061.html), accessed November 3, 2011;



**Sri Lanka shows promise**

The small island country, just off the southeast of India, has been struggling with internal strife for years, and is still recovering from the devastation of the 2004 tsunami. One of the main goals of its Ministry of Education has been to provide the younger generation with skills in Information Technology and the English language. This was one of the key drivers for the collaboration with OLPC and launch of the program that was planned to bring 1,250 new laptops to students in thirteen separate schools around Sri Lanka as a pilot project. This pilot program has received strong support by the World Bank.

In early 2008 a non-profit foundation called Lanka OLPC Foundation was established. The Sri Lanka Ministry of Education (MOE) pilots the One Laptop per Child (OLPC) program by purchasing laptops from the OLPC Foundation, with funding from the World Bank, and distributing them to students in selected primary schools throughout the country.

The Ministry of Education has chosen primary schools around Sri Lanka for the pilot project and is working in cooperation with a coalition of corporate donors (such as the Chart Foundation, Hatton National Bank and mobile provider Tigo) to get the project up and running. On December 10, 2009, Sri Lankan President Mahinda Rajapaksa and Education Minister Premajayantha presented the first 400 laptops at a public ceremony announcing the pilot program.

While the overall progress of OLPC's global vision has been steady and promising, the program has yet to really catch fire with many groups of stakeholders globally: teachers, parents, and government officials.

Sources: <http://blogs.worldbank.org/edutech/node/551>, accessed November 3, 2011; <http://blog.laptop.org/2009/09/13/updates-from-sri-lanka/>, accessed November 3, 2011; <http://blog.laptop.org/2009/12/10/sri-lankan-president-launches-a-national-xo-program/>, accessed November 3, 2011

**Piloted programs to build a bigger coalition**

Sri Lanka and Peru demonstrate another key success factor: setting up a high profile pilot that demonstrates success on a small scale and creates the possibility for expansion on a broader scale within the country.

**Found alternate donors to fund laptops**

OLPC also used innovative marketing to get more XOs to developing countries. The effort was called the "Give One Get One" campaign (see Figure 4) and ran from November 12

through December 31, 2007 and from November 17 through December 31, 2008 in the U.S. and Canada. For \$399 a consumer could buy two computers: one to own and one to give to a child in a developing country. The 2007 campaign raised \$35 million and a total of more than 100,000 XO laptops were distributed to children in Afghanistan, Cambodia, Ethiopia, Haiti, Mongolia and Rwanda.<sup>35</sup> However, the 2008 campaign raised only \$2.5 million, much less than expected given the previous year's success.<sup>36</sup> OLPC believed this was not a sustainable business model going forward.<sup>37</sup>

**A successful pilot in Arahuary, Peru**

Peru's purchase of more than 513,000 XO laptops so far is part of the educational intervention model spearheaded by the General Directorate of Educational Technologies to try and solve two fundamental challenges in Peru. First, increase the quality of overall education in Peru and second to reduce the gap in education between public and private schools, between urban and rural regions and generally between the rich and the poor.

Given these objectives, Peru initially targeted remote, rural areas – typically areas having high rates of poverty and illiteracy. Peru ran a pilot program with 60 XOs in Arahuary, a village in the Andes Mountains. The program has had some early success based on a study in May 2009. The study reported a 50% improvement in reading comprehension and 60% textual and mathematical analysis. Peru also won the UNESCO prize for the OLPC program in 2009.

In 2010, Peru passed Uruguay as the largest deployment of XOs in the world. However, it will not be a 1:1 deployment as in Uruguay; instead, the laptops will be placed in Technology Resource Centers where children can access them at assigned schedules. Despite the program facing some challenges generally associated with all educational ICT programs including technology infrastructure, planning and training, Oscar Becerra, head of the General Directorate of Educational Technologies, believes that the program will be a key factor in improving education in Peru.

Sources:

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Figure 4. Ad for the Give One Get One Program

*However, this is not enough and OLPC needs new and better solutions across its value chain to reach 10 million children in 5 years*

OLPC has so far deployed around 2.5 million laptops—well below expectations.<sup>38</sup> Charles Kane ponders the questions still facing OLPC today—“How do we realize our vision of putting a laptop in the hands of every child in the developing world?” “What are alternative solutions that will get us there faster?” “Should we go beyond laptops?” He believes that getting laptops to 10 million children in 5 years is an audacious but realistic goal.

The innovation value chain provides insights into new ways to get an education solution to every child in the developing world (see Figure 5).

Kane and his team have started thinking about new ways to produce laptops, new types of offerings, new channels to market, new partnerships, and new business models to meet their targets.

**Are there new markets to target?**

Learning from the difficulties OLPC faced in getting national governments on the initiative, the organization realized that local channels may be an attractive alternative. Kane is excited by the prospect, as he said, “Local is the way to go. Mayors and other local officials have as much power, influence and the necessary funding in cities and regions and may possibly get the laptops to children faster.”

There are several examples of initiatives being implemented successfully on a local or regional level as opposed to a national level, whether they be bus systems in Curitiba, Brazil, intelligent street lighting in Oslo, Norway, or the Velib bicycle rental program in Paris, France.

Curitiba, Brazil’s Bus Rapid Transit system serves as a model for urban planning for other

cities in Brazil and in the world. Architect Jamie Lerner, who became mayor in 1975 (and was reelected several times subsequently), led the initiative to transform the city. Curitiba created a unique system that focuses on the development of public rather than private transportation and added incentives such as transportation subsidies provided by employers that encouraged people to follow the system. Today, around 70% of the city’s commuters use the bus to travel to work and the city as a whole uses 30% less fuel leading to less pollution.

OLPC needs to look for these types of cities and regions who are willing to transform current educational practices locally, and have the resources and capabilities to do so. Running a successful program with these cities could potentially attract others to follow suit.

**Are there new ways to deliver?**

OLPC has had some success in accessing channels that resulted in a successful initiative. President Paul Kagame served as a powerful advocate of the program in Rwanda, ensuring continued focus on XO’s and the education programs in the country. Companies such as General Mills create an initiative that has benefited their company, OLPC and the children—the Win One Give One campaign. By entering coupon codes found in cereal boxes, a child gets a chance to win an XO while at the same time General Mills donates one to a child in Africa. OLPC needs to find other, similar channels along with new ones that can speed the distribution of laptops, give OLPC access to new markets, or provide critical funding for their programs.

Natura is Brazil’s largest manufacturer and seller of cosmetics. It has been featured several times

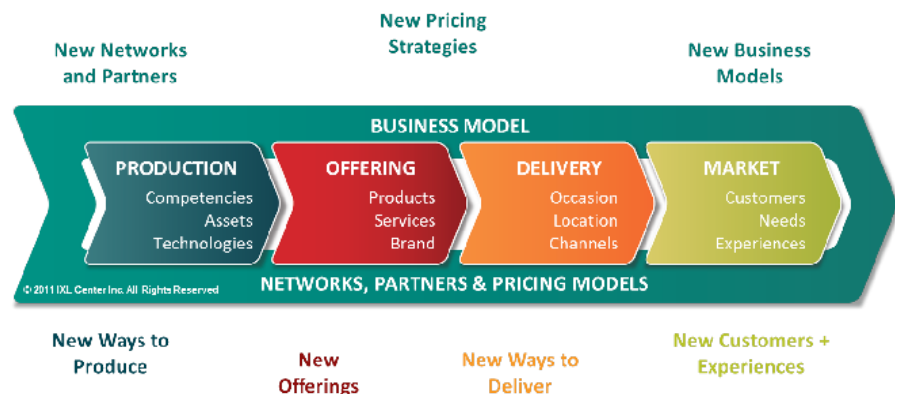


Figure 5. Innovation Value Chain

on Forbes' list of top innovators, not only for the sustainable way it produces its products, but also for its product delivery model. Natura relies on a direct sales model. Currently, they have around 1.5 million "consultants" spread across Brazil!<sup>41</sup> These consultants build relationships in their network and use these relationships to sell cosmetics. The system works because all Natura employees, including the sales consultants, are strong believers in the company's motto: "Well being well," meaning one has to have a good relationship with oneself and one has to have a good relationship with others and with the environment in order to be "well." The sales consultants have excellent relationships with their clients that go beyond just the sale of beauty products. Natura reaches its customers without big fancy stores or attractive ads, relying instead on people who build relationships and communicate what Natura is.

In a similar way, OLPC has to think of new ways to deliver its offering, whether it is a laptop or a software solution. What are the other channels to reach the children? Does it have a broader reach? Can you get the offering to children faster? How is it going to work?

### **Are there new offerings that OLPC can provide?**

Bob Hacker, CFO of OLPC Association, notes that OLPC differentiates itself in two ways from the competition: the ability to manage deployments, and Sugar. As mentioned, Sugar is free software, built to be a collaborative tool. Communities of developers around the world tinker with the program, build new ones and share their progress with each other. As a result, Sugar has grown beyond the default set of programs that a child gets in every deployment; it also runs on other computers besides the XO laptop. Easily loaded onto a USB drive, a user can plug into another computer and have Sugar running in minutes.

OLPC faces new challenges now, as Kane states, "Are there other ways in which we can utilize Sugar? Can we sell or distribute Sugar in other ways and use the profits to distribute more XOs?"

In 2004, IBM sold its PC division, which was losing profits, to Lenovo, a Chinese company aiming to go global.<sup>44</sup> IBM realized early on the trends in the industry pointed to a shift from hardware to software, and IBM decided to focus its business model on consulting and software. OLPC has to determine its own new business model; does OLPC's value lie in Sugar and its related applications, rather than the XO's hardware? How would OLPC sell a software offering instead of a hardware and software package? How would deployments change, given different hardware platforms?

Sugar is already platform independent and portable to any computer, making it a valuable asset. However, OLPC's offering must move beyond mere software compatibility to usability. OLPC must ensure that children will have the same technology experience, whether using a Windows-based PC, a Linux-based XO, or a tablet which might run Windows Mobile, Android or IOS.

Finally, OLPC must define anew the characteristics of a software offering. Will it be a complete bundle offering operating system and applications together? Or are the individual applications or "apps" offered separately?

### **Are there new ways to produce the offering?**

OLPC has also been exploring the potential of local partnerships to gain more support from each country's government. For example, in 2009, OLPC started looking for a company in Brazil who could assemble the XO 1.5 locally. The idea was to combine this with the G1G1 program, where companies and private institutions could purchase the laptop and the laptops would be donated to public schools. With the local production of the XOs, OLPC hopes to enter Brazil and participate in government projects which they could not do prior to building a local assembly facility.<sup>45</sup>

OLPC submitted a bid to sell 1 million XOs. If OLPC wins this bid, the funding for purchasing the laptops will be provided by the country's National Development Bank (BNDB). This bid has been preceded by many positive interactions between OLPC and Brazil. However, in 2010, Mandriva, another Linux distribution, announced that the Brazilian government chose to go with Intel Classmates for educational use nationwide.<sup>46</sup> What can OLPC do in the future to win government commitment in the face of competition? Are there other ways to gain buy-in?

Toyota has always been a leader in the automotive industry, notwithstanding the recent issues with vehicle recalls and the earthquake in Japan. The company was able to successfully penetrate the U.S. even with the presence of top U.S. automakers Ford, GM and Chrysler by placing emphasis not only on manufacturing cars but also on contributing to the welfare and development of the locality. In setting up facilities, Toyota made sure that each one is allowed to develop its own identity and contribute to the local economy.<sup>47</sup> In a similar fashion, OLPC needs to define its strategy in identifying local partners, suppliers and employees and guidelines in setting up a local office.

Everyone who worked in Toyota was trained in the “Toyota Way.” Because of this, the company ensured that vehicles were made with the same level of quality wherever it was made.<sup>48</sup> Toyota only uses one label “Made by Toyota” not “Made in the USA” or “Made in Japan.” Should OLPC think about offering similar training to ensure that quality and delivery of their offering remains consistent?

Could OLPC also consider how they can negotiate tax breaks with local officials to ensure they leverage economic advantages?

### **Are there new business models that will sustain OLPC?**

Recently, Kane considered the prospect of taking OLPC for-profit. As a for-profit company, the OLPC Association could target socially responsible investors to raise capital. This could give OLPC some financial flexibility to overcome barriers it has encountered in dealing with various governments. For example, OLPC requires bank-backed letters of credit before starting to manufacture laptops, which puts tremendous pressure on governments to promise a large amount of money upfront—a difficult constraint given national politics and budgets.<sup>49</sup>

With more capital and additional flexibility concerning that capital, could OLPC change this requirement and use lease arrangements? By allowing governments to pay for the laptops over time, they could decrease their initial outlay and resistance to purchasing laptops.

For Kane the question is how might OLPC be

structured as a for-profit institution? What are other viable business models for OLPC? Are there other ways to find funding? For example, are there ways that OLPC can tap into the capital markets or socially conscious investors? Given that Africa is doing well, what are the ways OLPC can help African countries gain access to capital markets for education initiatives?

Utilizing for-profit tools to advance social good has already been done, specifically in the healthcare industry. Between 1992 and 1998, more than a hundred non-profit and public hospitals converted to for-profit status mostly through acquisitions by investor-owned corporations.<sup>50</sup>

Financial instability was the most common reason for these hospitals converting to for-profit, according to a Commonwealth Fund report.<sup>51</sup> In the report’s eight case studies, the conversion to for-profit for six hospitals failed to solve their financial issues because they did not have a long-term plan in place and focused instead on short-term fixes. As an institution considers this step, having the right business model in place to ensure financial stability and attractive returns for investors is critical.

A related concern is how to the goals of the new stakeholders—the investors—should be aligned with the goals of the non-profit and defining governance. For hospitals who converted, there was a fear that services previously provided for free, or for very low fees, would now become unaffordable. According to the report, these concerns were unfounded.<sup>52</sup>

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## *Can OLPC get 10 million laptops to children in 5 years, drive the industry to make laptops more affordable, and improve education with its principles?*

Arboleda says “At this time, there are a billion children in the world and unless something dramatically similar to what we are doing can be accomplished, they will never be able to go further than the obscure medieval-like environment they have lived in now. And they will never participate in the world’s knowledge and economic systems.”<sup>53</sup> Kane believes that despite all these changes and the uncertainty in exploring new solutions, OLPC can fulfill its mission and bridge the digital divide to educate children worldwide.

Targeting 10 million children in 5 years is a realistic goal but a portion of OLPC’s success also lies in how the organization can influence others in pricing lower and as well as influence educational standards in developing nations with OLPC’s principles.

The question now becomes, can OLPC find new solutions that would achieve their goal and help children get the education they need to succeed in a global economy?

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#### About IXL Center



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