White Paper

Bridging the Digital Divide in Nigeria

Supported by the Intel® World Ahead Program, Nigeria is moving to bridge the digital divide and increase opportunities for jobs, education and participation in the global economy. Learn about Nigeria's challenges and achievements, and see what best practices are emerging from this successful private-public collaboration.

Collaborating to Expand Opportunities

Nigeria is one of the bright stars of sub-Saharan Africa. The continent's most populous country, Nigeria has rich oil reserves, a growing middle class, a young democracy and a youthful population. The average age is just 18.7, and four million babies are born annually.

Nigeria's leaders say its democracy, established in 1999, is creating a new spirit. "Nigeria has changed," says Nasir Ahmad el-Rafai, Minister of Nigeria's Federal Capital Territory. "You can feel the energy and entrepreneurship and the vibrant state of mind of our people."

Growing out of that spirit – and reinforcing it – is a commitment to use information and communications technology (ICT) to improve opportunities and enable Nigeria to play a larger role on the world stage. "We have the quality of people and entrepreneurship to be the next India," el-Rafai says. "We want people, when they think of where to go for technical support, to locate a call center, or to do verifications and accounts and so on – we want them to think Nigeria. Five years from now, we will certainly be a major player, and in ten years we want to be the world leader."

But first, Nigeria must increase ICT literacy, extend technology access, expand connectivity, shore up its struggling education system and strengthen its democracy. Nigeria doesn't want charity; it wants a sustainable business model that promotes long-term success, empowers local businesses, and increases opportunities for its people.

Nigeria is working with the Intel World Ahead Program, Intel's collaborative global initiative to connect the next billion people to 21st century opportunities. "We must bridge the digital divide," says Turner Isoun, Nigeria's Minister of Science and Technology. "We cannot do it alone, and we cannot do it in isolation. We need to do it in cooperation."

As a result of this collaboration, a digital inclusion program, the Computers for All Nigerians Initiative (CANi), is helping tens of thousands of Nigerians purchase their first PC. Nigerian school children are experiencing computers for the first time, and teachers are improving their ability to use technology to improve teaching and learning. Nigeria is laying a scalable foundation on which to build its future.

Having an Impact

- 55,000 Nigerians have purchased highly capable PCs.

- The capital city of Abuja is covered by a high-speed WiMAX* network.

- Four local PC manufacturers are producing PCs for the program and have increased production volumes by approximately 50 percent.

- Three banks are offering loans, and two have extended the program to their own employees.

- Participating employers include private enterprises, along with federal and state ministries and agencies.

Technology Access: Building a Sustainable Digital Inclusion Program

Like most of Africa, Nigeria faces a massive digital divide. In 2004, the nation had just seven PCs per 1,000 inhabitants, according to the International Telecommunications Union (ITU). Internet connectivity is in short supply. With gross domestic product of USD 1400 per person, the street price of a new PC is well beyond most Nigerians' reach, and consumer financing is limited. Civil service resources to design, implement and administer a digital inclusion program are limited.

To begin overcoming those obstacles, Nigeria's Federal Ministry of Science and Technology (FMST) and National Information Technology Development Agency (NITDA) collaborated with the Intel World Ahead Program and Microsoft to develop the Computers for All Nigerians Initiative.

CANi is a comprehensive program to enhance economic and social opportunity by improving access to affordable, high-quality PCs and the Internet. Under CANi, a choice of five Intel® processor-based laptop and desktop PCs are available to employees of participating public and private sector organizations at affordable prices. PCs are available from Nigerian companies as well as from multinational vendors including HP and Lenovo. Two-year, low-interest loans are available and are backed by participating employers. PCs come with:

- Microsoft Windows XP* Home operating system

- Microsoft Works* application suite

- Intel computer-based training on how to use a PC

"How do you educate four million children that you produce every year and prepare them to be competitive in the 21st century? That is our biggest challenge. We must use technology to democratize knowledge."

Nasir Ahmad el-Rafai
Minister
Federal Capital Territory

- Internet connectivity

- Delivery and setup

- Two years of robust post-sales technical support, including a six-day-a-week hotline

- Three-year manufacturers' warrantee (parts and labor) plus two years of insurance

More than Technologies

CANi's success required much more than technology. In designing the program, a core team of government personnel, Nigerian technologists, Intel and Microsoft, collaborated with Nigerian Internet service providers (ISPs), financial institutions, advertising agencies and employers, and local and international PC manufacturers. Intel shared best practices drawn from its experiences creating more than 200 digital inclusion programs in over 60 countries. Intel also connected Nigeria's leaders with officials of countries that had faced similar challenges. This leadership and information-sharing, along with the depth and breadth of the experience Intel and Microsoft offered, helped Nigeria create a program that benefits from international best practices and addresses local and regional issues.

Here are some challenges the team encountered and how they addressed them:

Understand the issues. NITDA, Intel and Microsoft started by conducting market surveys and working with a Nigerian consultant to identify a target user segment, study local issues, pinpoint roadblocks to success and plan ways to remove them. This groundwork was crucial to producing meaningful change.

Align the program with government priorities and objectives. The government's goals included building a computer-literate workforce and improving the nation's economy. It decided on an Employee Purchase Program (EPP) that would help private and public sector workers purchase PCs. Intel's survey showed that only 26

percent of Nigeria's workforce felt they had adequate IT skills, and an EPP would be an effective way to boost those skills. Employees would also present a lower-risk lending target than other constituencies might.

Provide high-quality, affordable PCs.
Affordability was a critical program objective, but no one wanted to deliver poor-quality PCs. To keep PC prices low, the government offered subsidies and tax waivers on CANi-related PC components, and encouraged employers to offer their own subsidies. Intel and Microsoft consulted with Nigerian PC companies to optimize the development and production of powerful, reliable PCs at low cost. Multinational PC vendors also participate in the program.

Develop practical payment plans. Since consumer financing in Nigeria is not broadly availably to lower-income groups, the program required extensive collaboration to develop payment plans that were convenient for employees and made sound business sense for all parties. Banks reduced lending risks by issuing loans to people who had jobs and whose employers collateralized the loans. In return, banks stood to gain new customers. Employers shared the risks, yet gained the benefits of a more committed and ICT-savvy workforce. Under the chosen finance model, employees who want to purchase a PC sign up with their employer, who then applies to the bank for financing. Fixed-interest loans are available for up to 24 months with a 20 percent down payment.

Choose the right technologies. To ensure the PCs delivered practical value, CANi specified leading, industry-standard hardware and operating systems that would run the latest applications and enable citizens to increase familiarity with widely used business software. The architecture team selected five Intel® processor-based PCs that cover a variety of price points, usage models and performance capabilities, and allow for mobile and desktop use.

"Intel brings us the lessons of their experiences in Turkey, the Middle East, South Africa and others, so we can benefit from international best practices."

Turner Isoun
Minister of Science and Technology
Nigeria

Increase and create opportunities for local industry and jobs. Digital inclusion programs should not only extend technology access but also strengthen the local ICT vendor community. Intel collaborated with Nigerian PC manufacturers and networking providers to help them produce high-quality solutions based on industry-standard technologies.

Generate awareness. Intel and Microsoft funded a comprehensive promotions campaign to increase understanding of the advantages of owning a PC and encourage participation. The campaign included news releases, television and radio advertisements and interviews. To build brand awareness, the team developed a name (CANi), a logo and a slogan: A computer in every Nigerian home.

Manage the program. To increase the chances for program success, it was important to create a program management office. Nigeria contracted with a local company, AMB Multiserve, to establish and run the CANi Program Management Office. This external office coordinates operational administration responsibilities such as applications processing, quality assurance, promotion and sales tracking.

Immediate Impact

In October 2005, Nigeria's president and cabinet approved the implementation plan. After successful pilots, the program was broadly launched in August 2006. Eight months later, both quantitative measures and interviews with a range of Nigerians indicate that CANi is already producing a tremendous benefit for Nigeria's government, citizens, businesses and IT industry:

- Approximately 55,000 Nigerians purchased highly capable PCs, giving them and their families the opportunity to increase their ICT skills and improve personal and business productivity.

- In additional to multinational vendors, four local PC manufacturers – Zinox, Omatek, Brian and Beta Computers – are producing PCs for the

program, generating new jobs and increasing their production volumes by approximately 50 percent.

- Three banks are offering loans, and two have extended the program to their own employees.

- Participating employers include several federal and state ministries and agencies, as well as a variety of private enterprises. Among them are Cross Rivers State, Abia State, Federal Capital Territory Administration (FCTA), the Nigerian Universities Commission, Nigerian Army, Afribank and First Bank of Nigeria.

With PCs and Internet access in the home, employees are improving their technology skills and joining the global community. Family members can use the PC for school projects and personal research into everything from disease prevention to job opportunities. One Nigerian who is benefiting is Fransica Edoh, who says having a PC and Internet access at home is helpful to herself and her family. "Knowledge is power, and now we have easy access to information," she explains. "It is helping out in placing orders for goods and services such as cosmetics and clothing, as well as in getting information in regard to schools for further education."

CANi is helping Nigerians increase their productivity, according to Mariam Wali Uwais, a legal practitioner. "I write a lot of papers and emails, and sometimes had to stay in the office to complete tasks," she says. "Now I am able to complete tasks at home and do not need to wait back in the office after work hours. I can manage home and office chores successfully, which I was not able to do before now. My husband and children use the PC for their homework and research."

CANi also opened the door to other digital inclusion initiatives with the Intel World Ahead Program, aimed at increasing broadband wireless access and improving education.

Connectivity: Maximizing Value

"A number of Nigerians are not computer and Internet literate. This has assisted them to be further enlightened and become a part of the global village."

Fransica Edoh
CANi Participant

To maximize the value of citizens' PCs, the package price of CANi PCs includes the cost of Internet connectivity. Intel has also worked with Nigeria's Suburban Telecom Ltd to accelerate the deployment of wireless networking in the capital city of Abuja, the surrounding Federal Capital Territory (FCT), and eventually in other of Nigeria's 36 states.

The result is the CTaccess* network, a joint venture between Suburban Broadband and Abuja Investment and Property Development Company (AIPDC), the commercial and investment arm of the FCT. CTaccess uses industry standards-based WiMAX technology to offer Abuja's businesses, government offices, schools and residents an affordable, high-speed alternative to cumbersome dialup connection and expensive satellite communications. Subscribers to the CTaccess WiMAX network are approximately 60 percent home users, 25 percent small businesses and 15 percent large businesses.

Highlighting Intel's hands-on involvement with local vendors, Intel collaborated extensively with Suburban, sharing both strategic insights and technical support. Representatives of Suburban Broadband say Intel's assistance was invaluable, both to Suburban and to Nigerian citizens.

"Intel has gotten directly involved in reducing the barrier faced by users intending them to acquire their own computers," says Felecia Solomon of Suburban Broadband.

"Intel has also helped us penetrate the Internet market by providing Internet service as a complement to acquiring a PC. Our provision of Internet service to homes and offices in Abuja is gradually bringing to an end the era of a lack of affordable Internet in the city. This is having a significant positive impact on the city of Abuja and has assisted in opening the doors to

organizations, schools and other groups that require Internet service. For example, it is enabling people to get first-hand online information, aiding teachers and students who have adopted e-learning in their schools, and helping businesses to operate more efficiently."

In Abuja, companies say the high bandwidth and reliable service of CTaccess help them conduct business more efficiently and create new business opportunities. "From Suburban's WiMAX network, we get good value for the money we pay, and enjoy fast speeds in uploads and downloads," says Fakolade Korede, Account Manager at Abuja's five-star Chida Hotel. "We are getting more patronage because we are able to give our customers every service they require, including Internet availability and online booking with the help of high-speed internet service provided by CTaccess."

Education: 21st Century Teaching and Learning

Nigeria offers free education for grades K-12, and has approximately three dozen institutions of higher education. However, only 29 percent of children in grades 7-12 attend school. One-third of the adult population lacks basic literacy, and education infrastructure is lacking or out of date. Nigerian educators and policy-makers are determined to improve basic literacy and create a new generation of leaders.

The Intel World Ahead Program is supporting Nigeria on a variety of projects to transform teaching and learning and achieve its goals. Intel shares a comprehensive, sustainable approach that promotes 21st century learning environments through an effective mix of technology, connectivity, teacher training, improved learning methods, and digital curriculum.

All these elements are at work at Government Junior Secondary School in the Jabi District, near

Abuja – and both test scores and student and teacher enthusiasm are rising. Prior to Intel's involvement, the Jabi School had no Internet access, and most students had never touched a PC.

In a pilot program supported by the Nigerian Federal Ministry of Education and the Federal Capital Territory Authority, Intel equipped a classroom of 36 students with classmate PCs, a new category of PCs designed to facilitate teacher-guided, student-centered learning (see sidebar). The teacher received an Intel® Core™ 2 Duo technology-based laptop computer, and Suburban Broadband installed a WiMAX network in the classroom and the surrounding area. Students worked in a one-to-one learning model, which encourages teachers to incorporate PCs across the curriculum.

"In terms of exams and test scores, there have been great improvements in the pilot class as compared to other classes in the same grade. I believe the classmate PC introduction caused these improvements."

Edegbe Osamwoni Perry
Teacher
Government Junior Secondary School, Jabi

Twenty teachers at the school received training through the Intel® Teach** program. This proven program has trained more than 4 million teachers in over 40 countries on using technology to support 21st century learning models. Intel will train 1,600 Nigerian teachers by 2011 – an important step in expanding the effective use of technology for teaching and learning.

Jabi is also using Intel's award-winning skoool™ curriculum resources, which apply advanced multimedia technology to help students master mathematics and science. Cinfores, a Nigerian educational software company, is adapting skoool to provide world-class digital curriculum resources for Nigeria's children.

Teachers quickly noticed a difference. "Students having their own notebooks have put in more zeal and interest in their studies as compared to when there was no computer at the school," says Edegbe Osamwoni Perry, who teaches at the Jabi School. "The pilot students are very much engaged with their studies and especially with their classmate PCs."

End-of-semester tests showed the pilot class scoring higher than two comparable classes on all areas of curriculum. Scores in Computer Science and Introductory Technology were significantly higher, and were no surprise. But the pilot students also scored higher in Mathematics and English, and significantly higher (10 points or more) in Integrated Science, Social Studies and Physical/Health Education. "I believe the classmate PC introduction caused these improvements," says Perry.

It's not only students who are enthusiastic. "I myself find that the PCs have made teaching and learning quite easy," Perry says. "The amount of knowledge I have acquired in this short period can never be overemphasized. I am just too excited at being part of this development."

Intel-powered classmate PCs for Teaching and Learning

Intel-powered classmate PCs give Nigerian children a reason to look forward to school. The design for these small, lightweight and highly capable mobile PCs was developed at Intel's Platform Definition Center following global studies by Intel's social science and market research teams.

Classmate PCs provide a rugged, kid-friendly design, including a water-proof keyboard and an easy-to-carry handle. They're colorful and fun – but also powerful enough to run video and educational software and other mainstream applications.

Classmate PCs, powered by Intel Corporation, provide teachers with an integrated educational feature set that facilitates classroom and content management, and supports teacher-student and teacher-parent collaboration. With students using classmate PCs and teachers employing Intel® Core™ 2 Duo-based laptops:

- Students can collaborate, exchange information and work with e-learning materials.

- Teachers can monitor classroom activity, supplement and extend their lectures with interactive material.

- Parents can track their child's progress in school and communicate with teachers.

Intel has announced plans to donate 3,000 Intel-powered classmate PCs to Nigerian schools over the next three years, providing a catalyst and enabler for broader adoption and purchase by governments and parents.

"Digital inclusion brings about a level playing field. It means that the little girl in a village in Nigeria can get the same information for her research project as a little girl in Washington or China."

Turner Isoun
Minister of Science and Technology
Nigeria

Nigeria is also the site of Africa's first mobile e-Learning school. Corona Secondary School, which is located in the Ogun state northwest of Lagos and is one of Nigeria's leading private secondary schools, wants to give its elite students the benefits of advanced technology and proven learning models. Building on its already-substantial ICT infrastructure, Corona implemented a high-speed WiMAX wireless network and established a program to help parents purchase an Intel processor-based laptop computer. Approximately 200 students and their families have purchased Intel-based laptops through the program, empowering teachers and students to use technology and the Internet in all areas of the curriculum and at any location on campus.

Corona's teachers have taken advantage of the Intel® Teach** program and skoool™ teaching and learning resources. "Many students don't like mathematics, but when you take them to the PC to work on it, they become very excited," says Adekoya Mufutau, technology coordinator at Corona Secondary School. "Skoool is very interactive, and students like it when the system responds to them. It keeps them working on the system for longer, and they learn more."

Key Learnings

Nigeria's efforts to cross the digital divide provide valuable lessons for any country where need is strong and resources are limited. Discussions with Nigerian leaders and members of Intel's World Ahead team suggest the following best practices:

- **Bridge the digital divide with a comprehensive, integrated approach.** A short-term, narrowly focused approach rarely delivers broad, long-term value. True digital inclusion requires comprehensive, sustainable efforts to make PCs affordable and available, enhance broadband wireless access, improve education and provide locally relevant content such as skoool™ curriculum resources. With support from the Intel World Ahead Program, Nigeria is targeting all four areas.

- **Collaborate to reduce risk.** Nigeria worked with private-sector leaders such as Intel and Microsoft, who each have long records of hands-on involvement with digital inclusion programs around the world. The CANi team collaborated with banks, PC producers and employers to ensure their concerns were understood and addressed. Such collaboration helps develop a sustainable business model and reduce the risks of change.

- **Build local industries.** From initial market studies to WiMAX pilots to PC platform assembly, the intense involvement of local businesses and organizations was critical to success. This involvement generates business growth, increases knowledge transfer and gives Nigerians a choice of PCs from local vendors as well as offerings from international leaders.

- **Follow best practices.** Intel shared key learnings and brought Nigerian leaders together with their peers from other nations for invaluable government-to-government information-sharing.

- **Implement a strong program management office.** Government resources are limited. A privately managed program management office, with strong links to government, can provide needed administrative oversight and help avoid situations that might lead to pirating, inaccurate reporting of sales and other problems.

- **Strengthen education through comprehensive approaches.** Technology alone is insufficient. A full solution must include teacher training and effective, locally relevant content. Children's PCs should support management and control features that enhance teacher-guided, student-centered learning.

- **Insist on high quality as well as low cost.** Affordability is critical, but must be weighed against the need for robust technologies that meet local needs. Through government and employer subsidies, low-interest loans and cooperative efforts by manufacturers to drive down costs and improve quality, CANi enables Nigerians to acquire reliable, highly capable PCs at an affordable price.

Reaching for the Future

"Five years from now, I think virtually every student, every school, every home will have a computer, and e-Learning will be ubiquitous. These programs are being pursued with vigor at every level. It is the only way we can prepare our children for the 21st century. It is the only way the country can become competitive. There is just no alternative."

Nasir Ahmad el-Rafai
Minister
Federal Capital Territory

Through its work to bridge the digital divide and improve education, Nigeria is creating the potential for far-reaching benefits. By enabling broader access to technology and beginning to create a consumer credit market, Nigeria is helping to build its middle class, expand economic opportunities for its youthful and fast-growing population, and enable the country to participate more effectively in the global economy.

Nigeria's leaders say they're also committed to using technology to improve government efficiency and strengthen democracy – factors that can encourage investment and foster economic growth. "We are introducing e-Government strategies across the federal government and state government, to bring government out to the people and improve service delivery," says el-Rafai. "Technology enables all that. Technology will help us put accountability into government and put out bad government."

Nigeria's early efforts to bridge the digital divide provide a model the country can follow in the future to extend technology's benefits more broadly. Among the possibilities:

- Purchase programs for teachers and students backed by teacher training and effective curriculum resources can reinforce Nigeria's efforts to modernize education and build IT literacy.

- Initiatives that combine WiMAX and PC availability can enable remote healthcare workers to consult with physicians in the nation's cities and universities, helping to bridge the healthcare divide that often exists between rural and urban areas.

- Purchase programs for small businesses can promote the growth of this important business sector.

Meanwhile, Nigeria is working toward its vision of global economic leadership. "We are putting in the infrastructure and enabling environment to be a world leader in information technology," says el-Rafai. "We're doing everything we can to ensure we get there. We have 150 million very clever, responsible people. We speak very good English. We are six hours ahead of New York and have very low wages. I don't think anything will stop us."
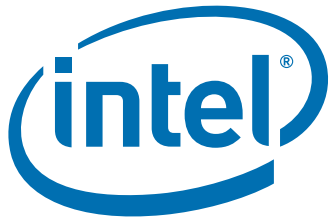
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