



*"Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it is the only thing that ever has."*

- Margaret Mead

Malaria, eliminated decades ago in the West, kills a child in Africa every 30 seconds. In 2006, Mozambique reported 6.3 million cases of malaria, equal to 32 percent of its population, resulting in more than 5,000 deaths. For those in government and the non-profit sector, bettering civil conditions in Mozambique is a big challenge. The country of more than 800,000 square kilometers, is beset with electrical disruptions, poorly maintained roads, insufficient vaccine supplies, and inadequate immunization logistical support, all of which impact animal and public health.

Enter Erik Charas, investment director for a non-profit organization and an engineer. Assessing the potential use of wireless technology and cell phones, Erik calculated that adding relatively inexpensive boosters to communication towers would increase data transmission to cover 80 percent of the country. To increase timely reporting, decrease errors in tabulating vaccination data, and increase logistical coordination, Erik built input screens into the cell phones of field campaign workers. This allowed workers to enter and transfer data immediately to central headquarters using text messages.

Erik, born in Mozambique, is one of the 'new kids' whose expertise, commitment and creativity are essential to meeting the challenges of vaccination campaigns for public health as well as animal health purposes, where foot-and-mouth disease, exotic Newcastle disease, tick infestations pose major domestic and international challenges. This effort is one example of how applying technology enables societal advancement. In parts of Mozambique, equipping public health workers with better technology has increased the number of children fully immunized each year by 47 percent.

## COMPUTER TECHNOLOGY A TOOL FOR GROWTH

Technological growth is one indicator of societal advancement and change. Applied to communications, technology began centuries ago when the Chinese found that pounding linen made paper and facilitated the transfer of accurate historical records to subsequent generations. In 1440, the Gutenberg press was invented and books became accessible to all, facilitating mass education. The first programmable computer, built in 1936, weighed

500 kilograms and could complete a simple multiplication problem in five seconds. The birth of the microprocessor around 1971 began the revolution that has put a supercomputer in every cell phone, PDA and automobile. Since 1945, computational performance has grown at a rate of 45 percent every year. While the price of computer power has fallen 47 percent per year relative to wages. These increases in productivity are far larger than that of any other good or service in the historical record.

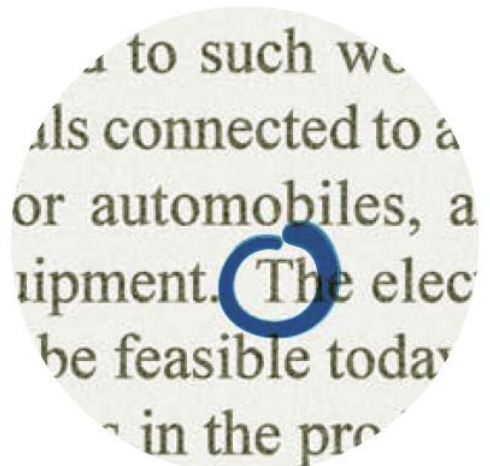
Health and allied professions have benefited immensely from such advances. Practitioners can access medical record databases for more rapid disaster response, there is increased public access to health care information, and the ability to track and mitigate disease outbreaks has expanded.

Microprocessing combining cell phones, wireless technology, and radio frequency identification devices (RFIDs) offer endless possibilities. There are 2.8 billion cell phones in the world with 1.6 million added each day. An estimated 10 billion microprocessors will be sold in 2007. This could mean unprecedented innovation and the ability to track products worldwide. People and animals can be tracked, too, to monitor migration, assess changes in emerging risk factors and help curtail disease spread. Consumers could be empowered in unanticipated ways. For instance, the supermarket of tomorrow could allow shoppers with allergens, dietary or health concerns to scan a food product's RFID to retrieve item information prior to purchase. By some estimates, RFIDs may eventually cost as little as \$.04 (USD).

### TECHNOLOGICAL GROWTH

Propelling economic, communication, educational and societal changes

The price per transistor on a computer chip has dropped dramatically since Intel was founded in 1968. Some people estimate that the price of a transistor is now about the same as that of one printed newspaper character. The number of transistors now shipped per year is about 100 times the number of ants estimated to be in the world.



- Intel Corporation, 2005 and 2006

## UNANTICIPATED SOCIAL CHANGE

Access to technology allows even the most removed communities to use computers to learn without classrooms and teachers (see insert). The delivery of curricula or information such as ‘health alerts’ via cell phones becomes a viable option. To spur economic growth and entrepreneurialism in some of the poorest countries, the World Bank is exploring the possible use of cell phones providing direct access to banking services.

The 1957 launch of Sputnik was a social and political change milestone that created public impressions that government could be a force for positive social improvement. Twelve years later, Neil Armstrong’s “giant leap for mankind” confirmed an assumption true even today in many countries – that major leaps forward can be planned and accomplished in a decade’s time. The increasingly interdependent global environment is showing us that technology may move society forward at a rate that far exceeds our accustomed planning and action horizons. To address the convergence of animal and public health means harnessing technology for larger and faster “leaps forward.”

## TECHNOLOGY FOSTERING “THE COMMONS”

Technology can also alter how public dialogue and policy development occurs. “Smart mobs,” self-structuring social groups that use technology to exchange information and coordinate, can influence public policy and cultural change. This can occur through the Internet via online communities such as “MySpace” and “YouTube.” It can generate complex levels of social coordination around “common themes” of interest in previously unimagined ways unrestricted by geography. It can leverage how a few can alter public discourse and underscores the philosophy of anthropologist Margaret Mead: “Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it is the only thing that ever has.”

The swell in the popularity of different food systems such as organically-produced food products or “buy local” food, the push toward “greener” modes of transportation, the growing public sentiment around animal welfare, the use of antibiotics in animal production, and substandard agricultural health practices are all examples of societal-driven agendas beginning to challenge and influence organized government.

## TECHNOLOGY AS A FOE?

Technology can also be a double-edged sword, fostering disruptive change. British physicist Stephan Hawking, one of this century’s premier thinkers stated, “The greatest threats this world faces are a result of advances in science and technology.”

Globally, change is unevenly distributed as some countries, lacking basic infrastructure, struggle to

meet the adoption of new requirements by more advanced countries, and struggle to develop the technology needed as developed countries more closely scrutinize their source of food and animal products. The addition of new equipment or laboratories means maintaining such investments.

Animals and products that feed global food supply chains that serve economic and political needs can be moved over longer distances over shorter periods of time. Hence, geographical barriers that may have once prevented the onset and spread of disease are becoming more common due to advancing transportation technology.

Advances in science and access to information can enable factions of society to create fear, death and economic upheaval through chemical, biological or radiological means that undermine the confidence in food, food systems and the supporting institutions.

## SUMMARY

Prior generations have grown accustomed to incremental change. ‘New kids’ with new tools, however, are changing society more rapidly than ever before. Globalization and technological advancements that are pushing these changes can be both positive and negative. A greater number of options lets individuals unite for common good or to undermine society. Access to information may open up ways to overcome obstacles, while also giving voice to grassroots efforts. The actions of establishments must take on a greater transparency than ever before. For public and animal health, the changes brought by technology will revolutionize the safekeeping of humankind in new and unanticipated ways.

### ONE LAPTOP PER CHILD TO ADVANCE HUMAN CONDITIONS IN MOST REMOTE AREAS

A computer for every child and learning for all. The One Laptop per Child (OLPC) Foundation, the brainchild of Nicholas Negroponte, is on a mission to put laptops in the hands of children in developing countries. Like a “Johnny Appleseed of the digital era,” OLPC seeks to give children, their families and their communities a gateway to the world, the chance to learn and learn about learning, and the creation of economic opportunities, enhanced public health infrastructures, and improved animal health practices. Priced at \$100(USD), the OLPC’s “XO” laptop is a durable, power-efficient machine conceived of in the Media Lab of MIT. To date, OLPC, has garnered partners such as AMD, Intel, Google, and the world’s largest maker of laptops, Quanta. OLPC has also earned purchase commitments from countries including Brazil, Nigeria, Libya, Uruguay, and Rwanda, among others.