

How

corporations can
change the world

**HP Social Innovation initiatives show how
fusing corporate and social outcomes can
impact lives on a global scale**



How can we, as a company, truly differentiate ourselves in the marketplace? For HP, discovering the answer to that question brought about momentous change – in its philosophy of corporate philanthropy, in how it evaluates opportunities, in how it applies its global technology leadership and in how it drives global, social impact.

The journey toward Social Innovation began in late 2009. The focus was on creating a shared value model of business and social impact, where everything that HP does on the commercial side of the business can be applied to addressing global, social issues. There is now a team of 20 full time employees spread across the globe that are seeking out, evaluating and executing on opportunities that enable HP to leverage its technology, business, and social leadership.

“To us, social innovation is the evolution of philanthropy, or what we like to call philanthropy 3.0,” says Gabriele Zedlmayer, Vice-President, Office of Global Social Innovation, HP. “When we evaluate a social innovation opportunity, we focus on the scope of social impact that we can achieve. To that end, we tap the foundation of our leadership when developing and implementing a social innovation solution – our partner network, our service portfolio and technology expertise. By doing that, we are changing lives first and foremost, while at the same time cementing social impact as a core pillar of our competitive differentiation.”

Evaluating social innovation opportunities

HP evaluates social innovation opportunities based on three key criteria:

- Leverage the talent, expertise and core assets of the business to drive more efficient use of resources in social impact initiatives while reinforcing the business' strengths and capabilities.
- Assess how sustainable, replicable and scalable solutions can improve lives using quantitative and qualitative measures.
- Partnering with a common goal of achieving program objectives drives the operational excellence required for optimum social and business impact.

HP's Social Innovation strategy focuses broadly on the areas of health and education, with a core focus on mobilizing employees through community involvement. The company also looks for opportunities where it can collaborate with communities, regional enterprises and NGOs to create scalable solution models that it can replicate in other countries/regions that are experiencing the challenges of the same or similar social issues.

The following are three examples of how HP's commitment to Social Innovation is coming to life in both the developed and developing world.



Gabriele Zedlmayer
VP, Office of Global
Social Innovation, HP

Partners HealthCare

1. Brigham and Women's Hospital, a key hub of Partners HealthCare research.

2. Partners HealthCare neuroscience researchers Dr. David Silbersweig and Dr. Emily Stern.

Changing how medicine is practiced

In November 2009, the HP Social Innovation team aligned with the HP business teams managing the multi-year strategic relationship between HP and Partners HealthCare, an integrated health system founded by Brigham and Women's Hospital and Massachusetts General Hospital.

In addition to its two academic medical centers, the Partners HealthCare system includes community and specialty hospitals, community health centers, a physician network, home health and long-term care services. A non-profit organization, Partners HealthCare is one of the nation's leading biomedical research organizations and a principal teaching affiliate of Harvard Medical School.

The Social Innovation team introduced a new paradigm for the relationship between HP and Partners HealthCare that went beyond technology leadership to include global, social change. Very quickly, the discussions focused on how to best support genomic research with the goal of advancing personalized medicine.

In the initial phases of its multi-year collaboration, HP and Partners HealthCare focused on building classic IT infrastructure that offered ample storage, memory and processing power to support the advances in genetic sequencing technologies. With that IT foundation in place, the current focus is on using HP's Converged Infrastructure technology to expand the collaborative research environment that will drive the clinical practice of personalized medicine.

And the potential is evident in both research and clinical labs across the Partners HealthCare network. Some of the world's leading scientists are pursuing new types of research opportunities because they now have unprecedented speed and processing power.

"Our commercial goal with Partners HealthCare was to do things with healthcare technology that had never been done before," says Paul Ellingstad, Director, Healthcare Initiatives and Partnerships, HP's Global Social Innovation. "The enterprise infrastructure that we



created collaboratively is unprecedented in its power, speed and capacity as well as in its evolving capabilities to support both research in the lab and practice in the clinic on the same technology foundation."

But building state-of-the-art technology hasn't been the only outcome. According to Diane Keogh, Corporate Director of Research Computing, Partners HealthCare, "the power of providing this IT infrastructure is really the power to change how medicine is practiced. By accelerating research, enabling clinical research applications and delivering personalized medicine directly to patients, we can transform both health systems and health outcomes – ultimately having a significant social impact on human health."

Advancing neuropsychiatric research

Partners HealthCare's neuroscience researchers have been able to transform and accelerate their work with the HP/Partners HealthCare enterprise infrastructure. Dr. David Silbersweig, Chairman, Department of Psychiatry and Institute for the Neurosciences, Brigham and Women's Hospital and Dr. Emily Stern, Director of the Functional Neuroimaging Laboratory and Co-director of Functional and Molecular Neuroimaging at Brigham and Women's Hospital are excellent examples. They are examining the neurophysiology of the brain to identify areas of brain activity non-invasively. Their focus is on tracking healthy and disordered brain

1. Dr. Michael Talkowski and his team can now speed up the process of sequencing analysis in patients with chromosomal rearrangements.



reactions in order to identify brain areas or circuit abnormalities to get a better understanding of the biological basis of a neuropsychiatric condition. With that biological foundation, they can better highlight the interconnection between psychology and anatomy.

“Disorders that were thought to be psychological, now have a basis in biology, says Dr. Silbersweig. “Using a neurobiological approach, we can understand the particulars of the circuitry and sub-circuitry on the systems level. And that’s where the computational power is critical. We can detect these signals, optimize the parameters and identify a set of areas that are activated. And we can analyze how the areas interact in time and space to understand overall brain health. With the technology, we can accelerate the possibilities of what we can ascertain.”

With these capabilities available to them, Dr. Silbersweig and Dr. Stern see a revolution on the horizon where they can have a real impact on the diagnosis, treatment, therapeutics and management of brain/mind disorders. “Our analysis is more sophisticated statistically, and we can pick up more subtle changes, which will be a distinct asset in our goal of moving to clinical application,” says Dr. Stern. “The technology that HP provides is transformational for us in the sense that we can do our best work, free of obstacles. We now have the capabilities to discover on a more expansive scale and move those findings to the clinic more rapidly.”

Empowering rapid, efficient sequencing analysis

The HP/Partners HealthCare infrastructure has also been a huge advantage to Dr. Michael Talkowski, Postdoctoral Fellow with Dr. James Gusella, Director of The Center for Human Genetic Research at Massachusetts General Hospital, in his examination of the genetic changes that could lead to autism or other neurodevelopmental disorders. The computational power is helping Dr. Talkowski and

his team with speeding up the process of sequencing analysis in patients that have a chromosomal rearrangement. By being able to identify where a chromosome is broken and how it affects the gene, Dr. Talkowski can predict the implications for the patient more effectively.

“From a geneticist’s perspective, the computational power that I can now access helps me solve the analytical challenge,” says Dr. Talkowski. “As technology evolved, we gained capacity to collect data, but we were lagging behind in our abilities to analyze it. Now we can deal with the huge volumes of data that come out of genetic sequencing and apply the analysis to benefit patient health outcomes.”

Dr. Talkowski sees a brighter future for patients suffering from neurodevelopmental disorders such as autism. With more sophisticated analysis capabilities, researchers could have the opportunity to assess genetic risk on a routine basis for certain disorders. For patients with chromosomal rearrangements, understanding the genetic changes, the mechanism by which they occur, and how they affect the brain creates possibilities to target drug therapies to very specific pathways in clusters of patients.

The Impact of Social Innovation

With the unprecedented speed and processing power of HP’s Converged Infrastructure technology, researchers at Partners HealthCare are pursuing new types of research opportunities in:

- Understanding the biological basis of neuropsychiatric conditions to highlight the interconnection between psychology and anatomy.
- Sequencing analysis in patients with neurodevelopmental disorders to determine genetic changes precisely with the goal of targeting drug therapies.

HIV Early Infant Diagnosis

1. Prior to automation, a lab worker records HIV test results manually.

Revolutionizing delivery of anti-retroviral treatment across Kenya

At any time, the number of pregnant women in Kenya is close to 1.5 million, and more than 120,000 infants are born exposed to HIV every year¹. Without intervention, the rate of mother-to-child transmission can be 35 to 40 percent². Traditionally, babies born of HIV positive mothers are tested for HIV by the age of six weeks, at the time of their first immunization shots. If the baby tests positive, it is critical that he or she begins anti-retroviral treatment immediately to extend life expectancy.

In 2007, The Clinton Health Access Initiative (CHAI), in partnership with Kenya's Ministry of Public Health and several NGOs took a giant leap in AIDS treatment in Africa. They developed four state of the art labs (in Nairobi, Kisumu, Kericho and Busia) for Polymerase Chain Reaction (PCR) testing, which tests directly for HIV DNA rather than antibodies. In the Early Infant Diagnosis of HIV (EID) program, health facilities collect blood samples for PCR testing from babies at the first immunization appointment so that the proper precautions can be taken to protect the child in the event of a positive HIV diagnosis. One out of two HIV positive infants who do not receive any intervention dies before age two.

Since 2007, more than 100,000 infants have been tested in more than 1500 centers across Kenya³. While the testing proved to be revolutionary in identifying HIV incidences, the program still struggled with how to deliver results back to mothers in a timely manner. Ideally, health facilities would receive results via courier within 30 days to coincide with the infant's next scheduled follow



up appointment. Time is obviously of the essence when dealing with a life or death situation for both mothers and their children.

But with the nature of Kenya's infrastructure and the remote locale of many of the health centers, the courier delivery was not reaching more than 70% of health centers in rural areas⁴. Sometimes, it took upwards of three months for mothers in rural areas to receive the test results, creating a perilous situation for both them and their babies.

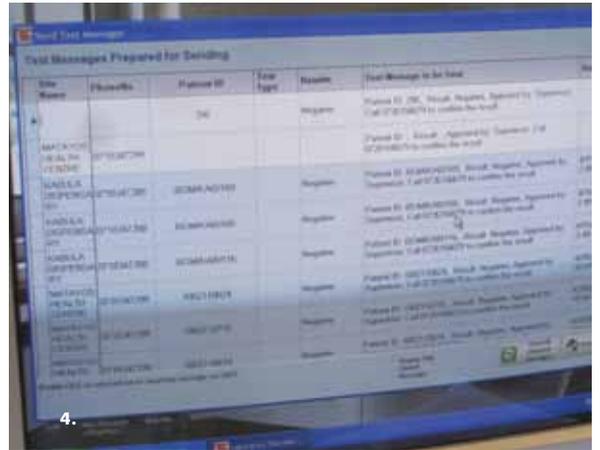
Speeding the time of diagnostic health reporting

"In the developing world, GSM is the only technology that has really penetrated deeply into mainstream culture," says Jackson Hangu, Clinton Health Access Initiative, Deputy Country Director for Kenya. "With mobile phone platforms, we realized that we could reach more people and solve more health problems."

CHAI's engagement with HP began in early 2010. HP realized an opportunity to play a vital role as both a technology and social innovation leader in providing a solution to speed the time of diagnostic health reporting. Partnering with CHAI, HP developed an ICT health infrastructure to support the EID program with an information management backbone. HP funded and built data centers at the four Kenyan labs as well as at the National AIDS and STI Control Program site. The hardware foundation was further enabled by software developed by Kenya's Strathmore University.

With the HP solution, every health center across Kenya will be equipped with a GSM-enabled printer

1. A mother takes her child to her six-week immunization appointment.
2. A doctor collects a blood sample from a baby girl at her six-week immunization appointment to test for HIV.
3. As part of the Early Infant Diagnosis of HIV (EID) program, health workers collect blood samples for polymerase chain reaction (PCR) testing.
4. A view of the software application that sends test results to GSM-enabled printers at health centers across Kenya to help to ensure timely receipt of test results.



so it receives test results directly from the labs in almost real time. With these capabilities, mothers receive HIV test results in one to two days instead of weeks or months. For 2011, CHAI aims to identify and treat up to 70,000 of the 120,000 infants exposed to HIV annually. And with the success of EID in Kenya for HIV testing, CHAI plans to replicate the program across 20 countries in Africa for HIV and other diseases including malaria and tuberculosis.

“When we originally invested in the EID program, only 25 percent of infants that came into the system got help,” says Hungu. “Of those who came into the system, 51 percent were not getting the results in a timely manner, which became a significant issue. We tackled that 51 percent with our HP collaboration to GSM-enable diagnostic test reporting. Our partnership with HP really was a critical first step in saving lives that would have been lost and creating opportunities for better health outcomes for HIV positive mothers and their children in Kenya.”

The Impact of Social Innovation

- Prior to HP’s involvement in enabling GSM delivery of HIV test results, more than 70 percent of health centers in rural areas were not receiving test results in a timely manner. With the HP solution, every health center across Kenya will receive test results in one to two days, rather than weeks or months, enabling CHAI to identify and treat up to 70,000 of the 120,000 infants exposed to HIV annually.

Anti-counterfeit drug authentication system in partnership with mPedigree

1. A consumer texts a code from the packaging of the prescription drug and receives an immediate SMS reply confirming authenticity.

Making sure that medicines cure not kill

Across Africa, more than 30 percent of malaria medicines are estimated to be fake⁵, and experts believe that approximately 700,000 people die from malaria or tuberculosis every year after taking counterfeit drugs⁶. mPedigree, an African social enterprise, has committed to tackling this social issue by empowering the consumer to get involved in authenticating products.

“The poor areas are at highest risk because that’s where the supply chain is weakest,” says Bright Simons, Founder and President of mPedigree Network. “In places like Accra, Ghana, many people get their medications at informal supply centers, which ultimately become key entry points for fake medication. And that represents one of the biggest threats to our project objectives – people losing confidence in the public health system because of the criminal activities and insidious intentions of counterfeiters.”

mPedigree began talks with HP in 2009 regarding the formation of a collaborative relationship for the trial rollout of the Medical Authentication System in Ghana and Nigeria. The first system was launched in December 2010 in Ghana and Nigeria simultaneously, with the participation of local pharmaceutical and telecom companies including May & Baker, Kama Group, MTN, Airtel, and several other telecom partners.

As part of the collaboration, HP leverages its innovation focus in cloud computing and mobile technology by providing printing and imaging technologies, content transformation, analytics, and cloud technologies to enable the automation of malaria medication authentication. mPedigree offers its deep and wide-ranging knowledge of the issues, markets and key players as well as its business process, business development interfaces, and web-based systems.

In agreeing to participate in the program, pharmaceutical companies print a unique code on each package of drugs. When the consumer purchases a prescription drug, he texts a code from the packaging, free of charge, to a designated phone number. That code is then checked against authentic codes stored in HP’s secure cloud. The patient



receives an immediate (within 26 seconds) SMS reply indicating whether the drugs are authentic or counterfeit. Local agencies including the West African Health Organization, the West African Pharmaceutical Manufacturers Association, the Health Access Network and the Pharmaceutical Society of Ghana have also agreed to participate as advocates in the wide-sweeping education campaign that includes billboards and ads designed to empower consumers to take responsibility for the products that they purchase.

The Medical Authentication System is currently running in Ghana and Nigeria, with plans to roll it out to Kenya, Tanzania, South Africa, and Uganda by the end of April 2011 and to Asia in the first quarter of 2012. mPedigree estimates that eliminating counterfeit drugs could save more than 700,000 lives per year.

The overall vision is to extend automated, GSM-enabled authentication capabilities across Africa, the Middle East and Asia for many types of medications and even across different industries where counterfeiting can jeopardize citizen health and safety. With HP’s global reach and technology penetration, this level of scalability is both realistic and possible.

“The number of stakeholders that we brought together to invest in the success of this program, from government agencies, pharmaceutical companies, telecoms and partners like HP to NGOs, local pharmacists and consumers, is truly remarkable,” says Simons. “It’s a massive undertaking that addresses one of the most retractable, complex problems facing healthcare in the developing world. The fact that we are at the forefront of the solution is exciting and provides immense motivation to move forward in protecting citizen health and saving lives.”

The Impact of Social Innovation

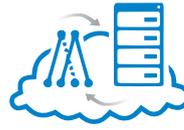
- Across Africa, more than 30 percent of malaria medicines are estimated to be fake. With the mPedigree Anti-counterfeit Drug Authentication System, patients buying medications send a free text with a unique identification code and receive confirmation of authenticity within 26 seconds. mPedigree estimates that eliminating counterfeit drugs could save more than 700,000 lives per year.



mPedigree and HP Systems for Fighting Counterfeit Drugs



CONSUMER



HP CLOUD



MOBILE PHONE

A patient texts a code from the prescription drug package to a designated phone number.

mPedigree works with pharmaceutical companies to print a unique code on each package of drugs. When a patient texts a code, it is checked against the authentic codes stored in HP's secure cloud.

The patient receives an immediate SMS reply indicating whether the drugs are real or counterfeit.

Social impact in a digital age

The world has definitely changed and our lives – as individuals, businesses, citizens, patients and students – are digital. It can be scary and overwhelming and confounding at times, but it also represents a huge opportunity to change the world in a positive way.

“Our commitment to social innovation is about those myriad of opportunities,” says HP’s Zedlmayer. “Yes, we are building symbiotic relationships where the social impact proof point delivers value to our business and where our technology expertise and social innovation vision are enabling these projects. But it’s a new type of symbiotic relationship built around how technology does more than help get the job done; it’s about how technology, and specifically HP technology, can change lives, solve complex social issues and make the world a better, safer, more just place to live in.”

As the lines between work and life blur even more, technology really can be what enables us rather than what confines us. And we see it as our responsibility, as one of the world’s technology leaders, to set the example of how technology enablement must go beyond simply driving profit to enriching the essence of the lives of the people it touches – their health, their wellbeing, their education and their opportunities for fulfillment and happiness.

For more information visit:
www.hp.com/hpinfo/socialinnovation

¹⁻⁴ According to data provided by the Kenya Ministry of Public Health & Sanitation. ⁵ AP: Africans text message to check if drugs are real, August 2010. ⁶ “Keeping It Real: Protecting the world’s poor from fake drugs,” International Policy Network, May 2009.

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