

**HP Engineers a Megacommunity**  
by Barbara Waugh

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# HP Engineers a Megacommunity

A multi-stakeholder effort to train engineers in Africa.

by **Barbara Waugh**

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## **What's the most important factor in production: capital, land, or labor?**

A growing number of economists would say, “None of the above.” The most important factor is knowledge — and, in particular, technological knowledge. For proof, one need only look at any small, landlocked emerging economy that is poor in natural resources: an economy such as those in many African countries. In these countries, knowledge may be the only factor of production available. Indeed, engineering education is a critical key to building capacity for any country, rich or poor, in the knowledge economy. Economic studies have shown that as much as 85 percent of measured growth in U.S. income per capita over the past 100 years was due to technological change. Economic “miracles” in Ireland, Finland, and Singapore bear out the significance of technology and engineering education.

These insights underpin the Hewlett-Packard (HP) Company's investment in engineering education. HP University Relations (UR) engages in many ways with the higher education community at more than 100 academic institutions around the globe. As a unit of HP Labs, UR catalyzes collaborative research programs. As an HP corporate function, UR broadens funding opportunities through public–private partnerships, participates in major sales efforts to build the HP business and brand, and helps human resources with recruit-

ment. As a global function, UR catalyzes multi-stakeholder initiatives for economic development through innovation, diversity, and quality assurance in engineering and science education.

The HP University Relations team that I lead is now developing experience in regional economic development. HP's first such initiative was in 1998, when a group of friends and colleagues began developing a vision for better preparing engineers to address the economic development needs of Latin America. In 2002, the group decided to gather like-minded thought leaders in Brazil. At that session, the idea of “Engineering for the Americas” was formally endorsed. This expanding core group from HP then established a partnership with the World Federation of Engineering Organizations (WFEO) and the Organization of American States to focus on quality assurance for engineering education. World-class engineering education, developed with industry partnership, doesn't just provide workers in the short term for the jobs that industry has. It also attracts further investment that in turn helps the region or country retain its graduates, rather than lose them to emigration.

In nine years, projects led by Lueny Morell, HP's University Relations director for Latin America; Luis Scarvada from PUC Rio; the accreditation bodies from Canada, Mexico, and the U.S.; and by Russ Jones, chair

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of the Capacity Building Committee of WFEO, grew to involve multiple stakeholders from industry, universities, and both governmental and nongovernmental agencies, including engineering education and accreditation agencies. Dan Marcek, on our team, currently manages this network, which includes the Organization of American States Ministers of Science and Technology; funding bodies such as the Inter-American Development Bank and the World Bank; and various organizations that support programs for the innovation of engineering education and the establishment of quality assurance mechanisms in the region.

In late 2006, we decided to invest in capacity building in Africa, leveraging what we'd learned in Latin America. But what had we really learned? All our knowledge was implicit and resided only in the Latin America team. I thus began attending their meetings and picking that team's brains.

**The Living Megacommunity**

In fact, what Wayne Johnson, vice president of University Relations at HP; Lueny Morell; and the rest of the team had been doing in Latin America was building a "megacommunity": a large, ongoing joint initiative among organizations that share a complex problem, the resolution of which defies unilateral solutions and depends instead on collaboration and a mutual goal. The megacommunity grows through informal networks of people with commitments that they act on together to make a difference. Organizational charters, structures, and hierarchies matter much less than people's commitments. Personal relationships are the sinew, conversation the blood, and informal networks the bones of the communities out of which comprehensive, multi-

year, sustainable work arises.

The megacommunity approach has several notable qualities. First, it takes advantage of self-interest. It doesn't require leaders of organizations to give up their drive for personal wealth, power, or status. Nor does it require organizations to forfeit their own objectives. Individuals and organizations come to megacommunities when they recognize that the problems facing them are more complex than they can solve alone.

Second, as stakeholders scale up and out from their immediate situation, they naturally take on larger social goals. At one meeting, a senior finance manager of one corporation — a person whom I might never have expected to become an advocate for peace — said, "War is now obsolete. War in any country harms our company because we do business in every country." A high-level government leader at another meeting acknowledged that the interests of insurance companies had given him the backing he needed to support efforts to slow down global climate change.

Third, megacommunity processes provide a natural platform for helping a region deal effectively with the goals of global competitiveness (on one hand) and the need for local quality of life and equity (on the other). As the megacommunity work engenders foresight and awareness among the leaders of a region's organizations, they become better equipped to reconcile these seemingly incompatible objectives.

Finally, megacommunity processes may innately contribute to creating a global middle class, a goal that former U.S. President Bill Clinton, among others, has identified as the most critical goal of our time. Ultimately, a well-designed megacommunity process may fulfill the role that participatory democracy (town

meetings and so forth) once played in a simpler world, enabling the whole to perceive and take care of all parts of itself.

Though no two initiatives could ever be the same, I hope that in telling the story of our African endeavor I can help inspire and enable others, especially colleagues in the private sector, to join this effort or begin their own in various parts of the world. Following the model we discerned as implicit in Latin America, our burgeoning initiative in Africa consists of these elements and actions so far:

**1. Commitment and Conversation.** *Start with your own passion and find others who share it.* My commitment of five decades to civil rights and the women's movement — played out in the last 25 years at Hewlett-Packard and including adventures raising two African-American children adopted at birth — is the subject of my book *The Soul in the Computer*. Two years ago, that commitment deepened profoundly. My daughter's boyfriend, the father of their unborn son, was murdered. Soon after, I learned that while he had been making plans for his new family, he had also been planning his own funeral. This shook me to the core. I have since learned that funeral plans are a fact of life for many African-American youth in American inner cities. (In some of these cities, HIV infection rates surpass those of some sub-Saharan countries.) I vowed to tackle apartheid by race, class, and gender with renewed focus, with compassionate and inspired support from my manager and friend, Wayne Johnson. I consciously made this commitment for several reasons at once: to save my own soul; to help diminish the tragedies that afflict many individuals, families, and communities in emerging economies, including that of African-Americans in the U.S.; and to help make participation in the global knowledge economy more widespread and robust. I also knew that only those countries that overcome apartheid can compete in the global economy. In the U.S., I focused on African-American engineering education. And I hoped to contribute in Africa by working to improve engineering education there.

Where to start? I'd never even been to Africa. I began by seeking out other internal stakeholders in HP through conversations. Many of them asked, "Why Africa?" Then I called our general manager for HP Africa, Olivier Suinat. He expressed great enthusiasm for anything we could do to increase the number of engineers in the region. He told me that, as a customer base, Africa was on par with many European markets.

Africa is, in fact, one of the fastest-growing emerging market regions in HP's "Europe, Middle East, and Africa" geography. The general ignorance of this fact within HP astonished me; how could we not know? Were we so blinded by the negative press on Africa — negative news stories outnumbered positive stories by a 12-to-one ratio, according to one research report — that we couldn't even see our own company's success? According to popular media, the continent was hopelessly lost to civil wars, corruption, famine, and AIDS and other diseases. However, high-tech businesspeople working there came back with stories of phenomenal growth and expanding trade. Massive investment in capacity building (much of it from China, India, and the Middle East, rather than from former colonial powers) was accelerating that growth. Indeed, Africa's 53 countries have experienced an unprecedented compound annual growth rate (CAGR) of more than 6 percent on gross domestic product (GDP) since 2004.

To be sure, some countries performed better than others. Many characterizations of Africa, treating the entire continent as one economy, grossly misrepresent the diverse realities there. As in the West, one could observe increasing gaps between haves and have-nots in wealth and development, even as the average level improved. But one factor seemed universal, and there we saw an opening for ourselves: Infrastructure progress was hampered mainly by the lack of skilled workers and the constant turnover caused by fierce competition for scarce talent. Olivier and others in the region stressed the urgent need to develop engineering education for capacity building.

Olivier then connected me with HP's new general manager for West Africa, Lloyd Atabansi. My first appointment with Lloyd was typical of the friendship we developed: Scheduled for one hour, it expanded to six. Lloyd was born in Nigeria and raised in the U.S.; he holds a master's degree and a Ph.D. from Howard University and Bowie State University, respectively, and has lectured at Carnegie Mellon, Johns Hopkins, and the University of Maryland as well as working for IBM and Accenture. Lloyd ultimately came to see himself as part of an African diaspora, which led him to return to Nigeria with his family to help rebuild his country of birth and the continent. Sharing our dreams and commitments, Lloyd and I began talking about an initiative that we call "Engineering Africa." We envision a multi-stakeholder quality assurance process to build engineering education throughout

Africa, beginning in Nigeria, and leveraging all we've learned from our Latin American initiative.

After Lloyd and I developed Engineering Africa into PowerPoint slides (the ontological *sine qua non* for corporate reality), we continued to identify HP stakeholders in Africa. A key stakeholder emerged from my own University Relations team. Arnaud Pierson, an HP engineer working with UNESCO, had developed a capacity-building initiative in southeastern Europe called Brain Gain. Universities in the region had lost as much as 80 percent of their faculty and students through attrition during the civil wars in the Balkan states. By equipping key universities in the region with high-end networking equipment, and money for research and exchange travel, these universities upgraded their research, increased enrollment and retention, and joined the global university research community. I asked Arnaud if we could expand the project to Africa. Conversations with UNESCO and the HP philanthropic organization were already under way. The UNESCO team selected Algeria, Nigeria, Ghana, Senegal, Kenya, and Zimbabwe to receive grants. Education ministers in these countries will select key universities to participate in the African Brain Gain initiative. Various people involved in that initiative joined the leadership of Engineering Africa.

**2. Shared Leadership.** *Find partner organizations in which at least one individual leader shares your passion and can commit the organization, at least in name, to the cause.* For many weeks, Engineering Africa existed only as a set of PowerPoint slides and conversations. The idea slowly gathered momentum in the U.S. and in Africa as Lloyd and I talked about it with others. Momentum accelerated when I shared the vision with Russ Jones, who suggested that HP and WFEO collaborate, and lead the effort together with WFEO as our public face. This approach offered several advantages. First, it was easier for other companies to join an effort not labeled "HP." Second, as in the rest of the world, so in Africa: Engineering academics prefer to join an effort championed by engineering educators and professionals over one driven by corporations, no matter how well-intentioned those companies may be. Finally, WFEO already included representatives from 90 countries, including many in Africa.

Russ invited me to describe the Engineering Africa vision at the WFEO Committee on Capacity Building in South Africa. This committee unanimously and with

great enthusiasm endorsed the joint project. (At HP, we like to underpromise and overdeliver. Thus, I found myself becoming a bit nervous about our enthusiastic reception. Said one African delegate: "This will be the greatest thing that has ever happened in Africa!")

**3. Stakeholders in Conference.** *Form a core team to plan a small conference that will expand the conversation to include local stakeholders already involved with related efforts and organizations.* A core team composed of all the HP stakeholders and Russ set to work to convene a meeting, which was held in Abuja, Nigeria, in March 2007. Through his many networks, Russ invited cosponsors, including the Nigerian Society of Engineers, the African Engineering Education Association, and the UNESCO Regional Bureau for Science and Technology in Africa, as well as key faculty in Nigeria and throughout the continent. HP invited companies based in Nigeria, in Africa and elsewhere globally, as well as Nigerian ministers.

The focus of the meeting was building technical capacity for economic development through engineering education in Africa, beginning in Nigeria. The 50 invited participants included engineering educators, industry leaders, government officials, and executives of related nongovernmental organizations, including the World Bank and several local foundations. In speeches, panel discussions, and informal conversations, people explored the industry need for technical workers; the current situation of engineering and engineering education; economic development; and university, industry, and government partnerships.

**4. Vision and Inspiration.** *Articulate the grandest vision you see to inspire, shape, and be shaped by your program.* Writing in the Kauffman Foundation's 2006 *ThoughtBook*, Wayne Johnson shared an inspiring vision for the world, one that encompasses our work of building economic capacity and making and selling information and communication technologies. Wayne proposed that knowledge supply chains and innovation ecosystems could innately enable global innovation and prosperity. The current state of national and regional innovation systems demonstrates that there is much work to be done.

In developed countries, innovation ecosystems include K-12, university, and postgraduate engineering and science education, and national investments in research and innovation. These ecosystems are running out of steam: They are piecemeal, bureaucratic, and

siloed (limited to a single sector's capabilities). In developing countries, innovation systems are opportunistic and fragmented. Everywhere in the world, these systems are failing to realize their potential. Wayne suggests that as an alternative, we could build multi-stakeholder national and regional innovation ecosystems or megacommunities that would develop into a global innovation ecosystem.

**5. Informal Collaboration.** *Learn other sectors' ways of operating.* Globalization has created unprecedented complexity: The density of cross-sector relationships has increased exponentially, to the point that the old and more formal methods of multisector collaboration, characterized by hierarchy and contracts, have broken down. Concurrently, issues facing each sector are now so intricate and interconnected with other sectors that siloed approaches are grossly inadequate. In place of formal structures and agreements to resolve issues to the benefit of each stakeholder (an approach that on most complex problems only exacerbates the problems), informal networks and collaborations have emerged to best benefit the network and indirectly improve the odds for each stakeholder.

Consider, for example, the state of corporate recruiting in Africa. Companies compete for too few graduates, creating turnover for one another and escalating wages to the point at which growth in their industry stalls. Some companies then decide to leave the country or region for lower-wage areas. Companies are now finding that only by cooperating to create a larger skilled labor pool — one that will benefit not just the country, the universities, and the graduates, but also their own competitors — will they meet their individual needs. Indeed, HP University Relations has

had no problem recruiting Hewlett-Packard competitors as partners in capacity-building efforts in the areas where HP UR does business. These megacommunities, informal networks optimizing for the benefit of the whole, require all sectors to learn new values and new ways of operating.

The private sector has much to offer nonprofit stakeholders. For example, for-profit enterprises can collaborate with engineering educators to shape the curricula to prepare students for the jobs that industry has to offer, and thereby contribute to the sustainability of the new educational capacity. When companies employ the graduates, the graduates in turn develop into an educated local professional and managerial class that remains in the country or region rather than emigrating elsewhere. Civil and grassroots groups also gain from exposure to corporate methods for such activities as strategic planning, program management, and event design.

But the private sector often assumes the upper hand in multisector engagements, to the detriment of the collective work. By contrast, stakeholders in a megacommunity must value one another's methods and values. That's particularly true for Engineering Africa, whose goal is to support and accelerate the emergence of an African innovation ecosystem. We have found that megacommunities benefit the private sector by helping businesspeople learn the values, skills, and abilities the civil sector has honed: community building, grassroots leadership, and consensus building. In fact, the best leadership development in the private sector (and the best leadership in general) incorporates lessons and paradigms of practice from all sectors.

**6. Scale and Influence.** *Scale your program until it becomes a megacommunity, and use your program to*

*inform and build other megacommunities.* I am helping to build one emergent megacommunity, which in turn informs my work in Africa. This initiative is currently a series of conversations, conferences, and projects aimed at developing gender equity for the engineering, IT, and communication technology fields, at all levels of education and in the workforce. The leader of the network, chosen through consensus, is Claudia Morrell, executive director of the Center for Women and IT at the University of Maryland, Baltimore County. Claudia had led a stellar local effort in Maryland; she then convened a meeting in Baltimore in 2005 to which she invited representatives from 38 countries to expand the context and impact of her local efforts. After participating in this conference, I joined her advisory board, and HP became a corporate sponsor of her work.

7. Sustained Engagement. Repeat the effort in other locales; constantly cross-reference all efforts across countries for local and broader-scale integration and impact. Even before the spring 2007 Nigerian conference, we had laid the groundwork for meetings with the new Nigerian government (whichever government would be elected in April 2007). We also conceived of a larger conference on the issues facing women in ICT and engineering, to occur later in 2007 at the time of the annual meeting of the Nigerian Society of Engineers, which draws 4,000 people from throughout the country. And we began talking with representatives from other countries who were interested in holding similar workshops.

Our multi-stakeholder effort to enhance engineering education in Africa is still in its first year. Even before our first conference, our work generated value in a number of ways. We made implicit knowledge explicit, identifying megacommunity processes and models, and discovered that we already have critical resources, concepts, and tools in place for regional economic development through quality assurance in engineering education. By trolling for stakeholders and resources for Africa, we turned up valuable support for our Latin American effort, and vice versa. As we identified internal stakeholders in HP, we helped articulate and consolidate a more robust company strategy for Africa. In planning our first conference, we drew together a core group with the momentum to survive the loss of any one member. That core is already growing, as some conference participants discover their passion for this endeavor. Finally, our work has allowed each of us a window on the most complex issues facing the planet, a

path to make a difference, and an opportunity to learn how to change the world together, more powerfully than we could change it alone. +

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## Resources

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