

## Emerging Nations Nudge Innovation

by Gail Dutton

Emerging nations are driving innovation. Don't believe it? Look around. Cell phones, voice messaging, even cloud computing are finding markets more welcoming than those in the developed world. The reason is clear: the lack of infrastructure means developing countries can leapfrog older technologies and go straight to the good stuff.

That is great from a sales point of view, but it also means product design and development are about to shift to those nations to be closer to the customer and to needs that just do not exist in the U.S. or Western Europe. Frankly, that is probably something data center managers should consider. Those subtle reverberations could result in a noticeable shift in how data centers do things. More broadly, "That puts pressure on us to change the way we use the technology," notes Katharine Frase, Ph.D., vice president, technical business strategy, software group, IBM, in Armonk, N.Y.

PCs, for example, are not ubiquitous in China. Cell phones and Blackberries fill the gap. Consequently, Chinese consumers are learning second languages via cell phone, while Europeans and North Americans are surfing via PC. That difference affects how applications are written, turning those with compressed versions into hot sellers in emerging markets. And, once hot, they shape future protocols for that technology.

Cloud computing is also finding a prominent niche in developing nations. Developed by powerhouses like IBM, Google and Amazon for their own use, they are leveraging the technology to provide hosted solutions for small- to medium-sized businesses throughout the world that need computing power but lack the capital to build or expand their own data centers.

While that has significant advantages for companies in industrialized nations, in emerging regions, it makes competition possible by providing the infrastructure to harness the systems U.S. companies expect of their global suppliers. That means offshore data centers can become competitive by adding services in cloud environments without investing in the infrastructure of existing data centers in the West. Based on that, some analysts have predicted the demise of traditional data centers. In their place, companies may decide to scatter data center operations among several different hosts.

Another repercussion is increased Internet traffic supporting the supply chain. George T. Haley, Ph.D., director of the Center for International Industry Competitiveness at the University of New Haven in West Haven, Conn., gives this example: "Pacific Bicycle, the largest distributor of bicycles in the U.S., switched to Chinese suppliers some years ago. It got tremendous price advantages, but some significant disadvantages in other areas. For example, Pacific Bicycle received shipments in two weeks from U.S. suppliers. When it shifted to Chinese manufacturers, it knew shipments would take longer, so it increased on-hand stocks and allowed for increased shipping times. What it didn't account for was variability in delivery time that ranged from six weeks to six months."

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Collaborative planning, forecasting and replenishment (CPFR) systems could have ameliorated the situation by at least providing real-time order tracking. U.S. companies have used CPFR systems for the past several years to increase efficiency and customer satisfaction. But, Dr. Haley, notes, "Smaller Chinese manufacturers operate on razor-thin margins...and lack the servers. By adopting cloud computing, they do not have to make heavy investments in servers or in energy." That also offers opportunities for companies experienced with clouds to expand operations abroad, either physically or virtually. Data centers that support cloud computing, therefore, may see an uptick in demand for their expertise and services.

IBM, for instance, is establishing a cloud computing center for software companies in China's Wuxi Tai Hu New Town Science and Education Industrial Park. The endeavor will provide each software company in the park with its own virtualized computing resources, replacing the data center model that is dominant in industrialized nations. A small company could develop a killer application using the cloud environment both to develop the application and, later, to host it, Dr. Frase says. That development also makes these companies less reliant upon Western technology because they will begin developing their own.

The Wuxi implementation offered a green field development opportunity. Because large computer centers are so few in the region, industry had not committed to an incompatible infrastructure, thus making cloud computing even more attractive.

The benefit to the developing market is lower barriers of entry, Dr. Frase says, helping companies get into the game faster. But working in developing markets also has benefits for IBM. "We want to have smart IBM people where our customers are, to add real value," she says. Adding the technology that spurs innovation broadens the talent pool and accelerates the rate at which IT shops in developing regions can be expected not just to tweak code but to do higher level design and development work. "The other thing," she adds, "is that to the degree to which we find it scary, it motivates us to become more inventive ourselves."

With innovate or die as the new tech mantra, technologists at all levels need to pay attention to trends and learn to innovate. Text messaging is another example. It found its niche in Europe and Asia before catching on with U.S. teenagers. Now the technology is evolving to a voice-based short message service (SMS)—a boon to illiterate populations—and to video SMS. Those options are considered more personal than text messages and still overcome the bias some cultures have against voice mail. "People hate to pay to talk to a machine," explains Jamie Warter, vice president of marketing, NMS Communications in Framingham, Mass. "So, in India, for example, voice mail is not widely deployed."

Does dealing with voice or video SMS change the way data centers deal with data? Could their storage or lack thereof expose companies in any way during discovery for litigation? Data center managers in the United States should consider these questions.

To meet the needs of emerging markets, companies are finding they often must rethink their products to remain competitive. Some, like Nokia, find that products designed for emerging markets have potential in the industrialized world, too. Nokia, for example launched a no-frills cell phone as a product for persons who simply want a phone with large keys.

In another example, EsLaRed in Uruguay has established a 382 kilometer (237 mile) wireless connection, making it economical to bring Internet to remote locations and to expand existing markets without adding fiber. That could affect where data is stored and could open opportunities for business even in industrialized nations. Likewise, two years ago, Microsoft offered FlexGo, a pay-as-you-go model for personal computing geared for low-income users in developing regions. Now we see similar models being used at the enterprise level in the form of SaaS.

That is a prime example of how a change in business processes can trickle to the data center and affect operations. Product innovation can only take a company so far, according to noted futurists John Segal, a consultant with Deloitte Touche USA LLP, and John Seely Brown, visiting scholar at the University of Southern California and former chief scientist for Xerox. Instead, the heart of innovation must lie in business processes that can sustain and empower product innovation.

The motorcycle industry, for example, is using business process networks in China in which modular components manufacturers meet the general design specifications but work among themselves to determine exactly how the product is built. (Think of this as contracting for a sustainable building and letting the builder decide whether it should be earth sheltered or use passive solar systems.) The result exchanges control for reduced costs, improved quality and time-to-market because the suppliers have

letting the builder decide whether it should be earth sheltered or use passive solar systems.) The result exchanges control for reduced costs, improved quality and time-to-market because the suppliers have more flexibility.

Emerging regions are becoming more than sources of potential customers. They are becoming serious contenders in terms of product and service development. "One of the things to keep in mind," Haley says, "is that emerging markets are number two, behind the U.S., in creating multinational companies. They are extremely capable and will be a serious problem for U.S. companies because they don't have the constraints and reports required by the West. They are fast-acting and don't require a high return on investment, so can spend proportionally more on R&D."

*Gail Dutton is a frequent contributor to DCM. She can be reached at [gaildutton@gmail.com](mailto:gaildutton@gmail.com)*