

## INTERACTIVE SESSION: ORGANIZATIONS

### IS GREEN COMPUTING GOOD FOR BUSINESS?

Computer rooms are becoming too hot to handle. Data-hungry tasks such as video on demand, downloading music, exchanging photos, and maintaining Web sites require more and more power-hungry machines. Power and cooling costs for data centers have skyrocketed by more than 800 percent since 1996, with U.S. enterprise data centers predicted to spend twice as much on energy costs as on hardware over the next five years.

The heat generated from rooms full of servers is causing equipment to fail. Some organizations spend more money to keep their data centers cool than they spend to lease the property itself. It's a vicious cycle, as companies must pay to power their servers, and then pay again to keep them cool and operational. Cooling a server requires roughly the same number of kilowatts of energy as running one. All this additional power consumption has a negative impact on the environment and as well as corporate operating costs.

Some of the world's most prominent firms are tackling their power consumption issues with one eye toward saving the environment and the other toward saving dollars. Google and Microsoft are building data centers that take advantage of hydroelectric power. Hewlett-Packard is working on a series of technologies to reduce the carbon footprint of data centers by 75 percent and, with new software and services, to measure energy use and carbon emissions. It reduced its power costs by 20 to 25 percent through consolidation of servers and data centers.

Microsoft's San Antonio data center deploys sensors that measure nearly all power consumption, recycles water used in cooling, and uses internally-developed power management software. Microsoft is also trying to encourage energy-saving software practices by charging business units by the amount of power they consume in the data center rather than the space they take up on the floor.

None of these companies claim that their efforts will save the world, but they do demonstrate recognition of a growing problem and the commencement of the green computing era. And since these companies' technology and processes are more efficient than most other companies, using their online software services in place of in-house software may also count as a green investment.

PCs typically stay on more than twice the amount of time they are actually being used each day. According to a report by the Alliance to Save Energy, a company with 10,000 personal computer desktops will spend more than \$165,000 per year in electricity bills if these machines are left on all night. The group estimates that this practice is wasting around \$1.7 billion each year in the United States alone.

Although many companies establish default PC power management settings, about 70 percent of employees turn these settings off. PC power management software from BigFix, 1E NightWatchman, and Verdiem locks PC power settings and automatically powers PCs up right before employees arrive for work in the morning.

Miami-Dade County public schools cut the time its PCs were on from 21 hours to 10.3 hours daily by using BigFix to centrally control PC power settings. City University of New York adopted Verdiem's Surveyor software to turn off its 20,000 PCs when they are inactive at night. Surveyor has trimmed 10 percent from CUNY's power bills, creating an annual savings of around \$320,000.

Virtualization is a highly effective tool for cost-effective green computing because it reduces the number of servers and storage resources in the firm's IT infrastructure. Fulton County, Georgia, which provides services for 988,000 citizens, scrutinizes energy usage when purchasing new information technology. It used VMWare virtualization software and a new Fujitsu blade server platform to consolidate underutilized legacy servers so that one machine performs the work that was formerly performed by eight, saving \$44,000 per year in power costs. These efforts also created a more up-to-date IT infrastructure.

Experts note that it's important for companies to measure their energy use and inventory and track their information technology assets both before and after they start their green initiatives. Commonly used metrics used by Microsoft and other companies include Power Usage Effectiveness, Data Center Infrastructure Efficiency, and Average Data Efficiency.

It isn't always necessary to purchase new technologies to achieve "green" goals. Organizations can achieve sizable efficiencies by better managing the computing resources they already have.

Health insurer Highmark initially wanted to increase its CPU utilization by 10 percent while reducing power use by 5 percent and eventually by 10 percent. When the company inventoried all of its information technology assets, it found that its information systems staff was hanging onto “dead” servers that served no function but continued to consume power. Unfortunately, many information systems departments still aren’t deploying their existing technology resources efficiently or using green measurement tools.

Programs to educate employees in energy conservation may also be necessary. In addition to using

energy-monitoring tools, Honda Motor Corporation trains its data center administrators how to be more energy efficient. For example, it taught them to decommission unused equipment quickly and to use management tools to ensure servers are being optimized.

*Sources:* Kathleen Lao, “The Green Issue,” *Computerworld Canada*, April 2010; Matthew Sarrell, “Greening Your Data Center: The Real Deal,” *eWeek*, January 15, 2010; Robert L. Mitchell, “Data Center Density Hits the Wall,” *Computerworld*, January 21, 2010; Jim Carlton, “The PC Goes on an Energy Diet,” *The Wall Street Journal*, September 8, 2009; and Ronan Kavanagh, “IT Virtualization Helps to Go Green,” *Information Management Magazine*, March 2009.

## CASE STUDY QUESTIONS

1. What business and social problems does data center power consumption cause?
2. What solutions are available for these problems? Which are environment-friendly?
3. What are the business benefits and costs of these solutions?
4. Should all firms move toward green computing? Why or why not?

## MIS IN ACTION

Perform an Internet search on the phrase “green computing” and then answer the following questions:

1. Who are some of the leaders of the green computing movement? Which corporations are leading the way? Which environmental organizations are playing an important role?
2. What are the latest trends in green computing? What kind of impact are they having?
3. What can individuals do to contribute to the green computing movement? Is the movement worthwhile?

## 5.4 CONTEMPORARY SOFTWARE PLATFORM TRENDS

There are four major themes in contemporary software platform evolution:

- Linux and open source software
- Java and Ajax
- Web services and service-oriented architecture
- Software outsourcing and cloud services

### LINUX AND OPEN SOURCE SOFTWARE

**Open source software** is software produced by a community of several hundred thousand programmers around the world. According to the leading open source professional association, OpenSource.org, open source software is free and can be modified by users. Works derived from the original code must also be free, and the software can be redistributed by the user without additional licensing. Open source software is by definition not restricted to any