Green Procurement Initiative

Nine lessons in Greening IT

Drawn from conversation at a Greening Greater Toronto (GGT) Green Exchange. The May 2010 conversation took place among IT purchasers for private and public sector organizations at the Ontario Institute of Purchasing Management Association of Canada.

The Green Exchange series brings together procurement executives from different sectors to discuss how purchasing practices can help reduce an organization's environmental footprint. GGT is supported by a number of partners, including the Ontario Power Authority.

Power Management

1. Central-control solutions are more effective than user training to achieve energy savings.

Purchasers who implemented employee training programs to have people turn off their machines at the end of the day reported highest penetration rates of 65 per cent, declining rapidly over time.

In contrast, most organizations have focused on control solutions, where IT staff program computers to turn off on a timed cycle. This is often matched with settings to turn off monitors or put computers into sleep-modes after a certain period of inactivity (adjusted to suit user needs at each organization). Purchasers report almost no user resistance to these solutions and consider it part of a larger trend of centralizing control of individual computers over a network. This is paired with a trend towards the increased use of thin-client machines over individual computers.

Most purchasers have solved common concerns about timed off-cycles with a software-based solution like the NightWatchman or Surveyor Windows server monitoring software. For instance, the software can turn computers on briefly in the early morning to install updates and patches. IT teams can also work with software to create exceptions for the small number of employees whose work requires late-night hours. Although computers must still be booted anew each morning, employees adapt with little complaint and IT staff considers this a benefit to computer health generally.

2. More innovative practices are unlikely to be adopted until well proven to work in real practice over time and to reduce costs.

Discussions about how NightWatchman and related software solutions became commonplace raised issues of innovation and risk management. A number of organizations, especially the larger corporations, are cautious about testing new solutions and service/IT based innovations unless they had been proven and accepted in the marketplace. With very few exceptions, executives at these organizations expressed a determination to keep corporate service and operations decisions low risk, taking a leading-edge role only in front-line business strategies. Unless green IT practices become a matter of competitive differentiation or business strategy, this is unlikely to change.

Computer Purchasing

3. Availability of certified products means green requirements rarely constrain purchasing.

Many purchasers use environmental specifications for IT purchasing. Common specifications include requirements for certification under various levels of EnergyStar, Ecologo and Electronic Products

Environmental Assessment Tool (EPEAT). Ecologo and EPEAT have the advantage of also including requirements for manufacturing and materials in addition to power use. Some purchasers specify a list of acceptable certifications rather than a single one. Other purchasers directly test the power consumption of units to verify performance instead of relying on certifications.

Purchasers are conscious of the changing landscape of what is considered green and do not wish to invest too heavily in specifications today which may not be best practices next year. Most deal with this by putting the onus on IT vendors to select and meet a certification of the vendor's choice. Purchasers who are more specific in terms of which certification or performance measures must be met have not found it difficult to stay abreast of changes over time.

Purchasers do not find that having environmental requirements limits their options, since most vendors are already conscious of environmental issues and have incorporated them into a wide variety of their product lines. Often all that is required is to ask about environmental considerations at an early stage in purchasing discussions.

4. **Beyond certification, changing user needs make the largest contribution to reducing the IT footprint.**

   Purchasers identified employee and workplace mobility as a current trend that is having a large positive impact on organizations' environmental footprint. Eliminating cases where an employee has offices in multiple buildings and increasing telecommuting and workspace flexibility are practices that reduce the number and impact of electronic devices in use. This trend is accelerating because of new technologies such as remote dial-in, telepresence meetings and shared network drives. The simple move from desktop to laptop computers alone reduces power use, due to the high efficiency of laptops.

Data Centres

5. **Huge opportunity exists to reduce energy use in data centres through better design and operation.**

   Data centres are significant consumers of energy and a large focus of time and effort for those organizations that have them. It is also increasingly clear that there is much room for improved energy efficiency, with most servers operating at four per cent average utilization. This is a consequence of the biggest design priority being uptime and capacity. Cooling is often done to eliminate even the smallest chance of overheating, resulting in situations where thermostats set adjacent to a heat emitting radiator cause rooms to be kept at freezer temperatures. The easiest savings available come through optimization of design, utilization and housing.

   In utilization, this includes reducing the number of servers used, employing virtualization and switching from servers to mainframes. In housing, paying closer attention to the placement of thermostats and adding fans strategically to effectively circulate and mix air can generate huge energy savings. Similarly, setting the thermostat to a slightly higher temperature, rather than overcompensating with more cold than necessary, can significantly reduce energy consumption.

6. **Some additional innovative green technologies are available but rarely used.**

   In addition to the good design principles above, organizations are introducing additional environmental-based innovations. One is a move towards liquid cooling, often water based. Though the technology is more expensive, liquid is much more energy efficient than air cooling, contributing to its resurging popularity. In Markham, Ontario, in the only current example in Canada, a Bell

Canada Data centre makes use of liquid cooling combined with another innovation, district energy, in which chilled water is obtained from a local district energy system rather than generated onsite. . Another centre called Telehouse West in East London, England, makes use of generated heat to warm nearby homes in winter rather than simply dispersing it. These models are often combined with free-cooling in which the weather during cold seasons is used to chill facilities by drawing in air.

7. **Any application of green innovations must take into account critical business needs.**

The caution raised by some organizations when discussing the energy heating and cooling innovations above relate to safety and reliability design constraints. Most data centre users require a level of reliability and safety from their data centres that makes it problematic to locate them near any uncontrolled human activity or potential terrorist targets. This often includes staying far from housing and other dense urban areas that could otherwise benefit from the waste heat. Reliability of power supply may also require centres to be built at the nexus of two or more electrical grids, further restricting locations in a way that could negate potential energy savings due to the distance required to extend district heating and cooling systems. Any environmental innovations therefore must avoid compromising these needs or otherwise mitigate the prospect of reduced reliability.

Motivation for Green IT

8. **Green IT choices are not often used to differentiate companies in marketing and branding.**

Though most organizations present considered environmental impact in their IT purchasing and practices, few were aware of these considerations playing a significant role in their Corporate Social Responsibility reporting, brand identity or promotions. There may be a low perceived promotional value in greening IT practices, possibly because there are few large or visible innovations available, or those available are not photogenic. In addition, practices like Energy Star requirements may be common enough in the industry that they don't allow differentiation between companies and thus are not worth promoting.

9. **Green IT choices are more often made to achieve efficiencies and match peer practices.**

Many of the green IT decisions discussed seem to have more to do with the following three sources of motivation.

First is cost efficiency, since so many energy efficiency practices can be tied to reduced operating costs. Second is low capital investment costs and ease in switching or changing practices. For example it is easier to decide to buy only certified computers when it hardly limits choices. Similarly data centre design is something being done anyway so no radical change is needed to do it with greater efficiency with mind.

Finally and perhaps most significantly, organizations are motivated by the need to match peer behavior in their industry. Environmental practices at this level of business operations are used to avoid falling behind rather than setting a company apart. Perhaps in time green IT practices will become a competitive differentiating factor, as did the importance of green facilities management with the rise of LEED buildings.