Lights Out Computer Room

A Digital Story

Why Turning the Lights Out Helps You See Better

With so much compute power moving to the desktop, is the computer room as we know it an anachronism? Or does it simply need to be reconsidered?

At Digital's Westford, Massachusetts operations for United States Manufacturing, you'll find a computer room, the kind that's become a fixture of business around the globe.

This one has VAX computers, VAXcluster Systems, and attendant peripherals and machines and supports 500 users. It is spacious and hums as one would expect for a facility of this size, but there is a noticeable difference, and it is, truly, curious. This room is almost always dark. That is, day to day, and virtually hour to hour, the lights never come on. In fact, rarely, if ever, is anyone to be seen in it. Designers and users call it the "Lights Out Computer Room," and it offers an interesting twist on the creative management of technology.

The Challenge

Westford Operations is responsible for the primary components of large VAX processors manufactured at plants around the United States. In addition, it has cooperative relations with groups throughout the world. Like many organizations of its kind, it has faced changes in recent years — in its case, consolidation of its 14-site operating staff into one facility in Westford, Massachusetts. In the course of the move, the following challenge was put to data center personnel — 1) build the best technical solution to meet the overall business objectives of the newly consolidated organization, 2) create a flexible working environment to suit the diverse needs of users — office automation activities, text generation, communications, and data analysis at one end,

The "disk farm" at Westford. What's different here? The lights are out, yet the data center is fully functioning.

application development for production systems at the other, 3) deliver excellent service and response time at a minimal cost per user. Note that point three is one of those goals of information systems management, often stated but hard to attain. In this case, it was an objective.

For Larry Wellington, the man who was handed the challenge and who is, today, Manager of Computer Services, it would require a profound shift in thinking. He did not know this when he started out, of course. To Wellington, a programmer — before he was a manager — who loved working among computers' back alleys, computers were what computing was all about. Best equipment, best solution. More equipment, even better. Computers came first. People, well, to be honest — second. Weren't data centers about computers after all? But what Bob Naismith, Westford's Group Information Manager, wanted required a different approach — one that

reconsidered the place of the data center in the delivery of computer services.

The idea was this: keep it as the engine of information activity and transformation, but automate as much as possible. Get computer operations support staff out of the computer room doing process tasks and get them into different work — managing the system, enhancing performance and capacity management, and increasing the productivity of the user population they served. Get users involved. Simplify. Simplify. Simplify. But be the best in terms of delivering information services.

Cost of Ownership

Much has been written about Digital's prolific use of its own products. Its 30,000 node network has sites in 45 countries. It's the largest, and perhaps most sophisticated, computer network in the world. It provides expanded communications throughout the company — and lets groups like the one in Westford decentralize in response to geographic influences or consolidate, as necessary, for operations. Digital's consistent architectures for hardware, software, and networks make for an extremely flexible computing environment.

While internal Digital customers like Wellington have a certain initial advantage on purchase price, implementing these computers still poses a burden in terms of the personnel and materials costs associated with actual cost of the system over its lifetime.

Consider this: true systems' ownership costs are lifetime costs. An analyst for the Gartner Group, reviewing a number

A modular approach to data center design, grouping equipment by type, makes for a more efficient and productive working environment.

of independently-produced studies (not by the Gartner Group), noted that these studies point out that "over the life of the equipment, personnel costs become a more significant factor than hardware costs when evaluating cost of ownership. And while salaries have increased by 20 to 30 per cent over the last five years, hardware costs have actually declined, thus adding even more importance to the human factor."

In an age when information technology is more in demand, yet companies also need to cut costs to compete globally, the way people plan and use information systems becomes more than a matter of economics; it's pure survival.

"If you don't ever turn the lights out, you won't ever be able to see what you're doing wrong. You turn the lights out to see better."
— Larry Wellington,
Computer Services Manager

Given all this, the standard approach to managing and maintaining a data center, as an accumulator of resources — both people and compute power — doesn't seem to meet the changing need. But the question remains — when you need to do more, how do you do more with less?

Thinking in Non-Traditional Ways

For Larry Wellington, it would mean thinking in a different way. It came unexpectedly — after he proposed his data center plan of VAXcluster Systems — high performance computers, disk drives, mass storage controllers and tape drives — and a staff of 12. Naismith accepted the hardware piece but, without wavering, nixed the staffing request. Instead he challenged Wellington to run this computer room "lights out." Not get rid of people, per se, but get more out of his people. Get them involved in the guts of the operation — planning for the future, managing the technology, doing the real work of helping people

transform information, not the more menial tasks of stripping printers, performing daily tape to disc backups and the like, "exercising their brains, not their hands," as Naismith points out. But although he never said it out loud, it was his need to cut the impact on his true cost of operation — the one he had to plan for over the systems' lifetime — that was driving the "lights out" decision.

But could it be done? Could increased levels of service be delivered with fewer people? Could the Westford community accept the new ways of delivering service? In challenging the status quo, could Wellington and his staff handle the risk?

So Wellington had to go back to the drawing board, but this time without a blueprint. While "lights out" wasn't a unique concept, it had never been attempted at Digital, as far as he knew. He had to begin at the beginning. "It got pretty elementary," he recalls, "getting down to the level of how you do things and what you do and who does what. We had to think in a radically different way." Like not taking things for granted, like questioning standard design and operating procedures. Jobs were examined on a case by case basis, as was the usefulness of various machines, and, over time, two strategies for managing change were developed.

New Strategies, New Solutions
The first revolved around designing the environment for ease of support. It was accomplished by using a modular and innovative approach to designing the environment: inside the data center, CPUs, disks, communications, and controls were separated into distinct areas to allow maximum flexibility and ease of

capacity planning. The total area in which an operator had to move about was minimized. This meant an operator could get in and out of the room quickly, that machines had a logical placement in terms of work to be done. Westford was also the first facility in the world to be completely wired with DECconnect — a simple, single wiring strategy which provides a consistent, easy-to-maintain office support environment and supports a variety of office configurations without the need to run additional cable with every change.

The second strategy for running the data center evolved out of the concern for — automation. The new plan reduced dependence on the three elements of data center operations that require operator support: tape, console, and printers.

Tape support was minimized through the use of disk-to-disk backup and high network bandwidth to encourage network transfer of data. Network transfer offers faster, cheaper, and more secure movement of data and does not require operator involvement. Nightly, disks are copied to backup disks, and operators, once a week, do the backup for off-site storage. Incremental backups, which take an enormous amount of operator time, have been done away with.

Another key enabler of the "lights out" concept was the VAXcluster Console System (VCS), software which reduces the need for console support and centralizes system management functions. With VCS, an operator can control all the systems in the data center from a single keyboard. The system manager can perform all system management functions including rebooting the system from a variety of locations, including home. In other words, a single operator
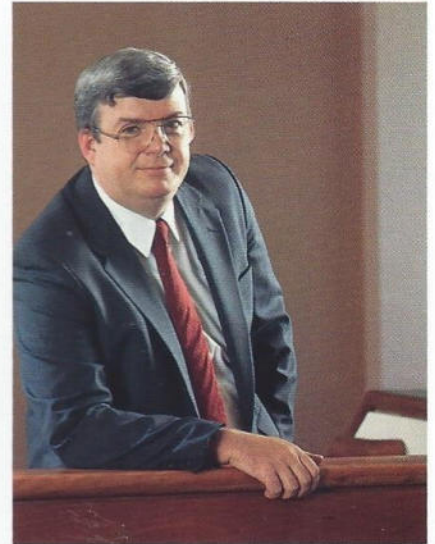
"There's a fixed base associated with a computing operation. Given a lights out approach, there are tremendous savings to be had."
*— Bob Naismith,*
Group Information Manager

can manage all systems from a single source — which does not have to be in the computer room.

But it was the print aspect of operations that required the most change. In fact, the real culprit in terms of operator hours spent in the computer room turned out to be the printer. By distributing laser printers throughout the building, and attaching slave printers to people's desks — the people who used the system became responsible for their output, not operators.

Another significant demand on operators' time — batch production jobs — was eliminated with the help of Applications Development personnel. For example, one very successful tool is a program called Management Decision Support, which gives managers in Westford control over the content, format, and timing of information they receive. People using MDS typically find it easier to review information on-screen rather than in printed form. It's an innovative use of Digital's technology in support of business objectives and demonstrates how the "lights out" approach has allowed people in Westford to understand technology better, and work with it more productively.

For more traditional applications, batch jobs are scheduled by users, have built-in verification checks, and use the network to transfer data from site to site, rather

Digital's Westford facility was the first in the world to be fully wired with DECconnect, a single communications wiring strategy, which emphasizes simplicity.
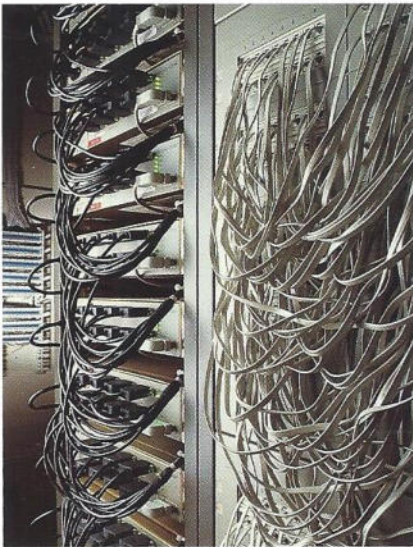
than relying on tapes. Only summary and exception reports are provided to users, another way operator involvement in the print aspect of operations is significantly reduced.

As operators' job descriptions change, it becomes clear that the true nature of their role in this kind of complex environment is not at the machine end but at the user end. In an information-access driven environment, end user support staff is the front line of the operation, assuring responsiveness and efficiency, helping users get the information they need, educating users to help themselves, taking responsibility off the shoulders of system managers, whose skills are better utilized in the direct management of the operation.

The result of these efforts? Information Systems provides its customer base with a productivity and competitive advantage in access to information, in ability to use that information better, in getting the most out of technology they possibly can. Operations personnel have been freed from routine tasks to help management more effectively use the information resource. The costs to maintain this data center, initially much lower than industry averages, have been slashed to unprecedented levels. And the data center supporting this international manufacturing operation does run virtually "lights out."

A year ago, Westford operations added a building, doubling capacity, providing Larry Wellington and staff a new challenge to face: keep on delivering the same quality service, while still doing more for less. But the message of the past few years is clear. Part of the solution is technology-focused — that is, increasing capital equipment in response to a decrease in labor; part is

VAXcluster Console System Software is at the heart of the "lights out" operation — all the systems in the data center can be controlled from a single keyboard, reducing the need for consoles, simplifying the operator's job.

not — that is, much can be done without major investment — rewriting applications for more efficient access to information, ensuring connectivity for easier access, reworking organization and operation design, educating the customer base — in short, integrating users and operations totally. "Integrating the enterprise buys you a lot in terms of efficiency," Bob Naismith says.

And always let yourself see more.
A data center viewed this way is not an anachronism but a tool for information management and transformation that fits the need of a different kind of organization, the new organization that's information-based.

digital

Digital believes that the information in this
publication is accurate as of its publication date;
such information is subject to change without
notice. Digital is not responsible for any
inadvertent errors.

The following are trademarks of Digital
Equipment Corporation: the Digital logo,
DECconnect, VAX, VAXcluster System.