

# Saving Money with Technology

Technology is probably the least favorite purchase of a small business owner, myself included. It seems that the gadgets you buy are only necessary because of other gadgets, the whole process only serving itself in spite of the promise to make our lives easier. Yet, this is the world we live in. To stay competitive and hit global markets, business needs technology. It has become a necessary evil. The question becomes “How do we keep up without having technology eat my time and budget?” The solution comes in the form of common sense.

## Some basic principles:

1. Don't implement what you don't have to. Keep it simple is more than a principle, it's mandatory to keep a business afloat. In spite of what some experts will have you believe, most solutions are not complex. These may be implemented quickly and simply. If the proposed solution sounds more like a Rube Goldberg invention than a technology solution, you either need more education on what is being proposed, or it is the wrong solution. Either way, don't sign on the dotted line.
2. Don't pay for something if you don't have to. There are a lot of free solutions to common business tech problems. Need a Computer Aided Design (CAD) package? Autocad costs \$4000.00 or more, while BRL-CAD is free. Office? You can spend \$400.00+ on Microsoft Office, or download Open Office for free. Need a database? MySQL is free and runs half the Internet databases used for new websites. More importantly, these solutions aren't from some kid living in their parent's basement. The folks that make the solutions I mentioned are the US Army Ballistics Research Labs, Sun Microsystems, and Oracle. All big players in the tech field who need no introduction.
3. Don't reinvent the wheel. Unless your application is truly unique, someone somewhere has already done what you need. More importantly, they have already had the learning experiences and have probably complained about them on line somewhere. Do a little research and learn from his mistakes. Save yourself the aggravation and expense.
4. Apply some common sense to statistics. If an article says that the industry will save a trillion dollars implementing a change, no one mentions minor details like the length of payoff or how much it will cost to implement. Read the fine print. In an article I read recently, the savings of a trillion dollars was over 50 years, and over 5 million users. This comes to a savings of about \$300.00 per month. To implement the plan would cost \$250 per month, making the net savings \$50.00 per month. A savings of \$50.00 per month, every month is nothing to sneeze at, but certainly not as impressive as the trillion dollar figure hyped in the article.
5. Saving a little every month is like having residual income. While it may seem trivial, saving a watt here and a watt there adds up. Careful component selection is the key to doing this with IT. Ironically, the equipment which saves energy is often cheaper to purchase. There are some trade offs though. An Intel Atom processor is reasonably quick, but not as fast as some of the top offerings. It is significantly slower in mathematical functions. If you intend to use this machine as a file server without a graphical user interface (GUI), then the Atom processor is nearly ideal. This means that while you could use Windows Server 2008, you probably shouldn't. To keep the performance levels up, Ubuntu Server or CentOS operating systems would yield a far superior result.

What would an implementation of these guidelines cost and look like? Lets look at an insurance agent's office I recently quoted. In this case we will assume we are to install a completely new system to replace five aging Celeron PCs running WindowsXP, a HP Laserjet 5, and a dual Xeon server with SCSI hard disks running Windows 2003 server. The network is connected with an old 3-Com Office connect 10/100 switch. In addition we will need to replace the 4 line phone system (POTS) with something that will provide call cues, voice mail, and music on hold. Our budget is \$5000.00 for parts and a total of 20 man-hours in labor.

The power draw for the old system is 575 watts for the Printer, 100 watts for the switch, and 450 watts for the server. While there is a monitor attached to the server, it is generally turned off with a ghost draw of 22 watts. Each workstation draws 180 watts plus another 120 for the monitors. This comes to a draw of 2647 watts while the office is in operation, and 522watts when it isn't. On top of this, the equipment produces just over 5000BTUs of heat. This heat will have to be cooled, demanding yet more power.

Replacing the workstations with laptops yields the largest power savings. At 88 watts per workstation, it reduces the draw of the network by over 1000 watts. Further, the heat produced is reduced by 2000BTUs. These may be replaced one at a time during working hours. Next is the printer. The venerable HP Laserjet 5 is a workhorse, but its modern equivalent consumes 8 watts at idle. During the course of the day this would eliminate another 4000kW/hrs and 1500BTUs given a typical 12% duty cycle. This unit may be swapped out during the day as well.

Over a long weekend the rest of the network may be replaced. The server, phone system, midspan power inserter, UPS, and firewall consume about the same as the old network switch alone and a lot less heat than the old server. New phones connected to a VoIP PBX replace the old telephone system.

So, what's the result of this upgrade? First, we are under budget in both time and parts. Total parts cost is \$4907.97 and it has taken 18 hours including wiring upgrades. The power consumption of the entire system is 238 watts on average during the day, and 133 watts at night. Even more impressive is that the thermal load has reduced from over 5102s to 673BTUs. Calculating the cost of \$0.22 per kW/h, it comes to \$2618.00 per year in energy savings. This upgrade pays for itself in energy savings alone within two years, faster if the old equipment is sold on eBay or Craigslist.

The new server is just as fast as the old one with much more capabilities and hard disk space. The phone system works much smoother, sounds more professional to prospective clients, and the overall productivity of the office will increase. Better yet, the amount of room the equipment requires is reduced and the data is in a locked cabinet bolted to the building. The systems take up less desktop real estate, and all parts of the system can maintain power during a power failure for several hours without dropping a call or loss of information. It remains business as usual. Both the software and administration of every aspect of the network is web based. The password secured administration screens of the UPS, managed switch, application server, file server, phone system, and firewall are available from anywhere on the local network. This means that the system is maintainable and operable by anyone in the organization that has the passwords.

All the software to implement the plan is free. Endian Firewall is by far the best firewall product I have ever used. It is Linux based and free to download. The documentation is good enough so that most will not need assistance or further training.

The servers run Linux, which is free to download and use. The first server runs CentOS 5.5 and acts as an application server for the businesses specific programs and backs up the data from the second server. The second server runs SARK, a specialized Linux distribution based upon CentOS which acts as a file server and VoIP phone appliance. A part of the file server's space is dedicated to backup the business data generated by the application server.

The application server runs a custom application written with ProcessMaker, accounting under NolaPRO, and client relationship management under vTiger. The only software package of these which is not free is NolaPro, and only because some additional packages are needed. The converter to take Quickbooks data and convert to NolaPro and other packages needed come to around \$60.00 as a one time fee, and another \$3.00 per year for updated tax tables. All of this software is web based, making it easy to connect to and operate with a minimum of learning curve, with no software installed or data stored on the workstations.

Services such as email, DNS, and web hosting are best left outside the organization for fault tolerance and simplicity. For around \$5.00 per month, you can host a domain with a service like GoDaddy or InMotion Hosting and it will give you multiple domains, subdomains, email aliases, and hundreds of mailboxes. All of these services are administrated by password secured web control panels.

OpenDNS allows you to create a custom DNS service which will effectively block services you choose. You can block social sites like MySpace, porn, and games from the workplace with a click of the mouse on their administration web page. Simply define your own DNS service at the site and then point the Endian Firewall at this site as the DNS server. All workstations will refer to the firewall as DNS service and it will forward these requests to the servers at OpenDNS.

The bottom line is that by implementing the five rules above and actually doing the math, a system can be designed which is more efficient by an order of magnitude and will pay for itself well within the lifespan of the product. The system is simple with a minimal learning curve and easy administration.

Tech should not be hard, complex or expensive. Businesses and individuals sometimes use their client's ignorance to sell them more products and services than they need. Look at what they are proposing long and hard. If after this you don't think you need it, what makes you think an outside contractor knows your business better than you do?