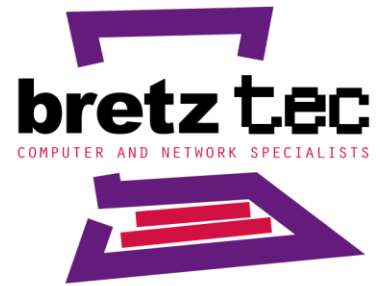


A Guide to the Upgrade, Repair or Replacement of Computer Hardware for the Small Business Owner



For most small business owners, a properly running computer and network system is one that operates on a day-to-day basis without thought to printing, backing up critical data, keeping the business flowing or any of the other tasks that the system is called on to perform. Only when it breaks or degrades such that work is no longer being accomplished in an efficient manner is it noticed. Typically, one of two conditions occurs. At some time, either the system becomes inadequate to the task it is being called on to perform or it fails in some way.

When a system simply stops being able to perform its duties efficiently, there are several options available:

- Upgrade.
- Replace and trash or donate the old system.
- Replace and transfer the old computer to a light user such as a receptionist.

When to upgrade the old system:

For many situations, an inexpensive upgrade can make an old system shine again. One of the most cost-effective upgrades is memory. During the last year, memory prices have dropped an amazing amount. DDR3 PC3-12800 memory is available for under \$40.00 for a 2GB stick. As you are reading this, the price will probably be lower. Older memory types have dropped, but not at quite this rate. Microsoft training recommends users to upgrade memory as one of their first tasks if a system is slow, switches between programs slowly, or has a lot of activity on the hard drive. This is also useful in some cases when a computer starts crashing for no reason. Adding programs, turning on the Active Desktop and installing small utilities from the web can cause users to suddenly start having memory-related problems.

Another component that has dropped dramatically is hard drive storage. 500Gbyte hard drives are now under \$100.00 and Terra-byte drives are in the \$200.00 to \$300.00 range. If the system will allow it, adding a second hard drive instead of replacing it will even save you from having to copy all of the original programs on the old hard drive to the new drive. Upgrading the hard drive in this manner not only gives you more disk space but allows you to copy critical files onto a second drive. While not as safe as an external backup, this can protect your critical data in case one of the hard drives fails.

Adding a DVD-RW or CD-RW drive is also an efficient upgrade for an older system. These drives can also function as an inexpensive backup device for most users. Blank CDs can be purchased for around 10 cents each and can protect 650 Mbytes of valuable data! DVDs are available for under \$0.25 each in bulk and can hold 4.2GBytes of data.

As with all upgrades, get advice on whether the new component is compatible with the old system and make sure there is room in the computer to house the new component.

When to repair the old system:

When a system fails, the important questions are:

- Should I repair or replace it?
- Was the failure major or minor? Did you lose the system board or a floppy drive?

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- Was the system performing adequately or was it near the end of its useful life anyway?
- What was the value of the old system and what will it cost to replace it in today's market?

If you decide to repair the existing system, the main question is whether to do it in-house or have someone else perform the repair. While repairs can be technically simple if you are replacing something like a floppy drive and if a correct replacement can be easily found, many times it is still better to just let someone else do the job. As a small business owner, your most critical assets are probably money and time.

If you decide to repair the system yourself, or have someone in the office who has a flair for these things do it, you are still looking at the lost productivity of one or more people. If you decide to have a system repaired in the office by placing a service call, you will be paying for parts and the labor for the service call. You will also have a timeframe as to when the system should be available again. As an alternative, some of the major computer stores will install hardware for free if the part is bought in the store and the machine is brought in for service.

When to replace the old system:

One of the worse problems to encounter is trying to replace a system where a suitable replacement is no longer available. Many special purpose systems such as the IBM Display Writer are no longer commonly available. Problems that you will encounter include finding a way to preserve and hopefully use all of the data that was associated with the old system. If you have essential programs that run under DOS, CPM, or other legacy operating systems, unusual hardware requirements such as 8" floppy drives, or any need that is no longer supported by today's hardware, you may be resigned to repairing the system no matter what the cost, abandoning the data and functionality associated with the old system, or recreating the data on a new machine.

If you are in the relatively happy situation of needing to find a replacement for a standard system such as a PC or Macintosh computer, the trends in technology will probably be on your side. Monster Machines from just a few years ago can be replaced in many cases with systems costing around \$800.00 to \$1,000.00 on the PC side. In addition, the new systems will probably have more memory and disk space than was even possible on the old machine. New features such as USB 2.0, Giga-Bit Ethernet Networking, and High-Speed Graphics with astounding resolution are now standard on most systems.

Considerations:

Type of Machine: There are three classes of machines, Entry-level, Midrange, and Monster Machines. Entry-level machines are great to use for a student or home applications, but should never be used in a business environment. Too many things are left out to hit the price-point that makes these systems attractive. They also tend to have more failures than the other classes of systems. Midrange systems will handle most of the general office needs while Monster systems should be reserved for Servers or applications that will stress the capabilities of most systems such as scientific analysis or image related applications.

Cost: Expect to pay around \$800 to \$1,000 for a name brand Midrange system. A Monster Machine will cost considerably more depending on the features you need such as dual processors. If cost is a deciding factor, consider a system assembled from off-the-shelf components. Significant savings are available and you can tune these systems to more exactly meet your needs.

Style: There are five main computer styles.

- The Pizza Box has the advantage that it saves room on the desktop since you can usually set the monitor right on top of it. Expansion is usually limited due to the small size.
- The Mini-tower is the most common enclosure found in the Midrange computer. This enclosure usually has limited front panel expansion capabilities. It has several free slots for various expansion cards such as a high-speed graphics adapter.



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- The Full-tower adds extra room and allows more devices to be added to the computer both internally and accessible from the front such as a removable drive. Usually the System board also has more slots for expansion boards.
- Rack mounted systems are available where large numbers of computers need to be stored in a limited sized facility. A typical system bolts into a 19" rack and uses under 2 inches of rack space. A large number of computers can be operated out of a 6ft rack.
- Laptops provide the ultimate in portability and capacity with the limitation that they have limited upgradability. Usually, only the hard drive and memory is ever upgraded.

Planning for the future:

A good rule of thumb is to upgrade to a system that will meet your needs for at least the next 3 years and have some capability to add new hardware to the system to cope with unexpected needs or advances in technology. This means buying a system better than what you need to do the job today. But, on the other hand, buying cutting-edge technology can easily kill a budget.

For instance, if your company is growing and you are adding computers and staff, when your computer network exceeds around 10 computers, you should start looking at upgrading to one of the more powerful operating systems such as Windows 2008 Small Business Server. Instead of having to administer passwords and users on each machine, you can now do everything on one server. Also, if the machines are set up properly, any user can go to any machine and have their same environment. All their files, programs, and capabilities will be exactly as they were at their desk. The beauty of this is that if a computer fails, anyone can simply go to one of the other computers in the office and continue their work.



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