**Disposing of End-of-Life Computers**

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**Executive Summary**

Today, many business enterprises employ capital assets in the form of electronic equipment (e.g., personal computers, workstations and peripherals) in large quantities. As a result of rapid technological progress, these products have a very short life cycle, typically in the sub-three year range (Ravi). After buying new ones, how to deal with these end-of-life computer products becomes a big problem for many companies. Recycling often is cited as the answer, but refurbishment and resale now are being recognized as the ultimate solution. But how do companies get used technology out of their offices and into the hands of those who need it? Without knowledge of trusted options, many companies simply store devices, which is not only a waste of space but also a potential security and environmental risk, what's more, time spent in storage greatly devalues equipment that could have generated income on the secondary market. Another result of inadequate end-of-life IT asset management is continuation of software licenses and service agreements that, believe it or not, can end up costing companies millions per year.

Recently, our company faces the same problem, because we need to replace 68 very old desktop workstations which are five and six years old and 48 small monitors which are nine years old. These computers are heavily used by the staff in our design department, so it is critical to have up-to-date equipment that can support modern software, more intensive computing tasks, and also run virtual machines.

There are four options to handle these end-of-life computers, landfilled, stored, recycled and reused. Since landfilled harms the environment, stored, recycled and reused are common options for most companies. And as most of our old computers or some parts are still in good working order, storing them will be a waste opportunity. Comparing recycled and reused, for PCs, the environmental “payback” of recycling is relatively small and reused will be a better option if old computers have good market value.

Since reused is our best option, the next step is how to resell these equipment. However, disposing can be risky. The "risks" associated with these end-of-life computers disposal include data security concerns, escalating disposal costs and administrative issues.

The best solution is using IT Popular IT asset life-cycle management (ITALM) to dispose of our old computers. We can focus on its four management processes, from deployment, transfer of data and proprietary images, hard-drive cleansing, to disposal of the replaced PC step by step. Actually, we can choose a professional IT asset management vendor to help us to use ITALM and deal with these end-of-life computers. Comparing different type of providers of end-of-life management services, Vernon Computer Source become our better choice. This company is a professional computer rental company and offers complete audit and end-of-life solutions which can remove business used computer equipment at the greatest market value. Its Chicago branch gives us an original offer for our computers $800 per PC including 4 discarded computers.

**Introduction: unusable computers**

There are 108 employees in our design department. Every day, they use computer software to design and/ or analysis every machine part or a machine as a whole and plan required material. Some of them even use two computers.

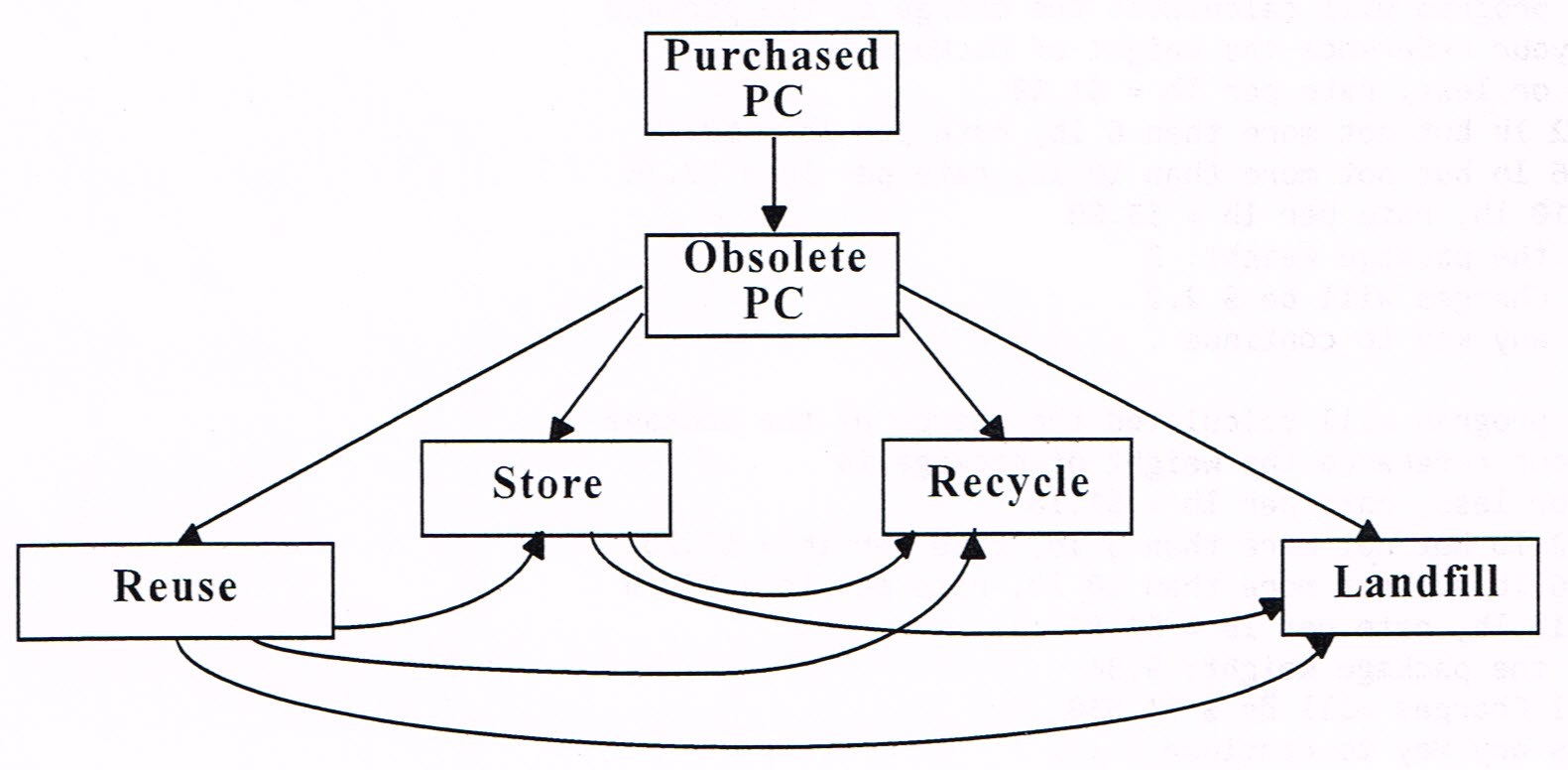
At the moment, our design department includes:

* 43 PCs, bought in 2006
* 25 PCs, bought in 2007
* 24 PCs, bought in 2010
* 28 PCs, bought in 2011
* 68 Dell 19"/20" low-resolution, non-widescreen monitors, bought in 2003
* 20 Dell 24" high-resolution, widescreen LED Monitor, bought in 2010
* 32 Dell Dual Monitor Bundle - Qty 2 - Dell UltraSharp U2312HM 23-inch Widescreen Monitor, bought in 2011

Nowadays, there continues to be a strong need for powerful desktop workstations for many programming and development tasks. Many obsolete computers can’t support new software published in recently two years. Beside, too small monitor screens reduce the staff’s efficiency at work.

Therefore, we decided to replace all of the five- and six-year-old PCs in our design department (total of 68) with Dell Optiplex. And we will also replace all of the small, low-resolution monitors (nine years old), with larger, high-resolution monitors (68).

**Green IT: reused is best option**



**Figure 1 – Flow Diagram of Current Computers Disposition Model (Williams and Kuerh)**

After buying new computer equipment, how to deal with these end-of-life computers becomes an urgent problem for us. There are four options to deal with these old computers: landfilled, stored, recycled and reused. United Nations University research by professors Rudiger Kuerh and Eric Williams gives us a current computer disposition model which they have studied (see Figure 1). In this model, the reused and storage options are only intermediate stages in the lifecycle of a computer. Only recycled and landfilled are terminal points. This model shows that a computer can be purchased, reused, stored, and finally recycled or landfilled depend on the age and condition of the PC.

* **Landfilled**

Ten years ago, if discarded totally, these old computers will be landfilled directly. Landfilled is very popular but it harms the environment a lot. The US Environmental Protection Agency (EPA) estimates, between 2003 and 2005, as much as 85 percent of the disposed electronics in the U.S. went straight in the trash and headed directly to local landfills or incinerators (EPA). Actually, landfilled could seriously harm the environment if not properly handled. The dangers of discarded, old computers stem from what's inside them. A PC with many circuit boards -- may contain up to 8 pounds (3.6 kilograms) of lead, along with lower levels of mercury, arsenic, cadmium, beryllium and other toxic chemicals (Downing). These elements are all toxic at varying exposure levels. There is also a fairly poisonous family of flame-retardant chemicals used in most electronics. Many of the aforementioned hazardous chemicals and toxic substances are known to cause health problems -- and in some cases death -- when exposure occurs in large doses. As you may imagine, landfills are a particularly harsh hotbed for pollutants. In the U.S., e-waste accounts for approximately 4 percent of the total amount of trash, but it contributes about 40 percent of the lead content in landfills. Of the other heavy metals in landfills, e-waste accounts for about 70 percent of that pollution (Downing). While most landfills are strategically located in an attempt to contain potential soil and water contamination, having this much hazardous waste on the ground may be cause for concern.

* **Stored, recycled and reused**

Nowadays, we think about more environment benefits. Before landfilled, many companies choose to reuse, store or recycle these old computers. Comparing their feature, reused will be best option to deal with our old computers. Stored only occupy space and is unprofitable for the owner. However, most of our old computers or some parts are still in good working order, and storing them will be a wasted opportunity. Regarding recycled and reused, generally, reuse be prioritized over recycled because the latter can demand high amounts of energy and other inputs (for transport, disassembly, destruction and other processing) to recover the desired product fractions. Recycled does not always recover all of the raw materials, creating residual wastes that will require landfill (EPA). Also, even if a recycling process recovered 100 percent of materials from a product, this does not account for wastes generated during its manufacture, which can be considerable (Leonard). In the case of e-waste, recycled is often the favored management method, though it is not necessarily the best one. This is particularly so when we consider unwanted PCs. Compared to some other waste electronics, for PCs, the environmental “payback” of recycling is relatively small (Williams and Kuerh). This is due to the concentration of energy intensity in PC production and typically short life spans of their actual use, fuelled by rapid product innovation and high levels of replacement. A 2003 study reveals that passing on a PC for someone else to use can be 20 times better for the environment than breaking it up and recycling it (Zeigler).

**Company Administration: disposing can be risky**

Since reused is our best option, we will think about how to resell the equipment. However, it is not a simply step to accomplish and proper disposal of computer assets presents a variety of new challenges and risks to our company. The "risks" associated with these end-of-life computers disposal include data security concerns, escalating disposal costs and administrative issues.

* **Compliance**

During the past few years, there has been a marked increase in government regulations dictating how enterprises should conduct business and safeguard the personal data they collect. Such government regulations were enacted to protect customers' personal financial data.

Government regulations have awakened businesses to the need for erasing all data from computer assets before disposal, including the need for documenting the process of drive erasure. Disposing of computer assets without ensuring proper file deletion presents huge business risks, as well as the danger of non-compliance with federal laws.

Paul Baum, the CEO of PlanlTROI Inc, an IT asset recovery firm located in Denville, indicate erasing data requires “skilled technical people, special equipment and software”. Without these 3 elements, data often can be easily taken off supposedly erased media (Baum). To prevent data theft, if the hard drive cannot be erased according to the specifications, the hard drive will be destroyed.

* **Costs**

Our next focus is the costs for managing IT asset retirement and must avoid the nonessential waste nonessential. When computer assets are replaced, the retired units entail soft costs for removal, redeployment, storage and tracking. Those costs include disconnecting the computer from the network and printers, packaging, transportation, backing up and sanitizing the hard drives, testing the equipment, remarketing, reporting and processing payments. Baum estimates such costs amount to about $200 per desktop. If the PC has no value, there's a disposal cost will be $230 (Baum). A typical outsourcing fee amounts to about $60, but if the PC has value, this fee can be offset by the residual value. Perhaps, the residual value will be greater than the fee. It depends on the age, condition and configuration of the PC.

If we find a professional IT asset management vendor, the vendor will limit the cost and manage the disposal. The process of the vendor may include a first consultation, audit, contract, removal of PCs from client premises (including packaging and shipping, grading and testing), cleaning, data erasure or media destruction, reselling or disposal—or donation, reallocation or redeployment through recycling (Baum). Then there's provision of documentation and payment (for IT assets that have residual value greater than end-of-life costs) either after audit or within 90 days for those who choose a consignment arrangement.

* **Administration**

If disposing of these old computers without management, maybe we will still pay software license fees, support charge for them, or forget to transfer the data from these old computers to corresponding person’s computers. Any of these mistakes will bring great loss to our company.

If we use some equipment lifecycle management, we will strategically manage hardware from acquisition through disposal and evaluates a company's business plans and computing requirements throughout the entire planning period in coordination with procurement decisions. Baum cites companies that “systematically manage the lifecycle of their IT assets can reduce cost per asset by as much as 30% the first year, and between 5% and 10% annually over the next 5 years” (Baum).

**Proposed solution: IT asset life-cycle management (ITALM)**

Popular IT asset life-cycle management (ITALM) is an effective implementation of IT asset management. We can use this management to dispose our old computers. ITALM will ensue that the procurement process focuses on more than the initial purchase price and includes deployment, transfer of data and proprietary images, hard-drive cleansing, and disposal of the replaced PC step by step. Furthermore, we can cooperate with a professional IT asset management vendor, Vernon Computer Source, to help us with the removal, secure hard drives and even the disposal of these old computers. It will save our time and enables us to maximize value.

* **Defining IT asset life-cycle management (ITALM)**



**Figure 2: ITALM Is Central To Efficient and Effective IT Services (Hubbert, 2008)\**

Before using this management, we should know what is IT asset life-cycle management (ITALM). Forrester defines ITALM as:

*The accounting for all assets throughout their life cycle from procurement to disposal.* (Hubbert)

There are four core management processes of ITALM — procurement, financial management, operations, and end-of-life (see Figure 2). These processes require monitoring, controlling, and accounting for assets through their life cycle and is part of the overall service support and service delivery processes in IT.

* **Procurement**

This is the first step of ITALM. In our case, we should figure out the numbers of old computers which we will dispose. According to purchasing department’s assets catalog, our IT department will determine if the equipment should be sold or discarded. If any equipment is determined to have cash value, it will be sold to vendors of used equipment. If it is out of work and no value, it will be returned to original equipment manufacturer.

* **Financial management**

The second step is financial management. In our case, we should find the lease, license and warranty situation of these old computers. Our IT department should determine those which have leasing software or peripheral products, those which have effective software license and those which have effective warranty or the warranty will come due. Then, according the different circumstance, we can terminate lease contract, redeploy peripheral products, transfer software license to corresponding new computers or don’t renew the warranty.

* **Operation**

Operation will be the third step. In our case, IT department will disconnect these old computers from the network and printers, transfer data to corresponding person’s computer, erase the data, remove all software, and sometimes destroy the hard disk.

* **End-of-life**

Final step is end-of-life and this is a core process for ITLAM. In our case, we decide to dispose these computers. Next problem is choosing a provider of end-of-life management services. There are three options: original equipment manufacturers (OEM), reseller or partner of original equipment manufacturer or third party. They are equally for end-of-life management services, particularly for logistics and final disposition (see Figure 3). Another research found that worldwide, 35 percent of the businesses surveyed used third-party asset disposal companies (Truini).



**Figure 3: Original equipment manufacturers, their resellers or partners, and third party equally (Forrester Research, Inc.)**

Choosing a provider depends on your old computers’ market value. Usually, if you find your old computer can’t work and is no value, you can choose to return them to original equipment manufacturers. The OEM just promises this is free return and you will have no financial returns. Actually, most of our computers are still in good working order. The reason why we will replace them is they could not satisfy our design department’s demand. After looking for some providers of third party, resellers or partners of original equipment manufacturers, Vernon Computer Source, a third party IT end-of-life service vendor become our better choice.

* **Vernon Computer Source**

Vernon Computer Source is a professional computer rental company and offers complete audit and end-of-life solutions which can removal business used computer equipment at the greatest market value. They give us an original offer for our computers $800 per PC including 4 discarded computers. It will be our highest offer in these providers. They promise our employees can purchase our used surplus [computers or rental](http://www.vernoncomputersource.com/computer-rental) equipment from them on–line at a discounted rate. Most important is they will remove, secure our computer hardware and ensure it is re-cycled in an environmentally safe and government regulated facility. They have a branch in Chicago and their address is 11 East Adams, Chicago, IL 60603, telephone number: (312) 283–0113.

**Conclusion**

Our problem is how to deal with 68 retired computers and 68 old monitors after buying new computer equipment. Since landfilled harms the environment, stored, recycled or reused be our options. And as our old computers have good market value, reused will be better choice. However, how to resell them isn’t so simple. Before disposing them, we should erase all the data from these unusable computers, and they need professional person, equipment and software to do. Secondly, we should calculate the disposing cost because disposing them by ourselves or by a professional IT asset management vendor, the cost will be quite different. Finally, without management, disposing will pay many unnecessary fees.

Our solution is using popular IT asset life-cycle management (ITALM) to dispose our old computers. At the same time, we can cooperate with a provider of end-of-life management services, Vernon Computer Source. It is a professional computer rental company and offer complete audit and end-of-life solutions. Vernon Computer Source gives us a pretty good offer, $800 per PC including 4 discarded computers. That means we will receive over $50,000 from 68 old computers. And if we deal with them by ourselves and without ITALM, disposal cost will be $200 per PC, $230 per discard desktop and the amount cost will be almost $14,000.

**Works cited**

“A Plan To Reduce Enterprise Costs And Risks By Managing End-Of-Life IT Assets.” *Forrester*

*Research, Inc.*, June 30, 2010. Web. 30 Oct. 2012.

Baum, Paul. “Disposing Of Computer Equipment Can Be Risky.” *National Underwriter / Life & Health*

*Financial Services.* February 7, 2005;109(5):24-31. *Business Source Complete*, Web. October 10,

2012.

Downing, Bob. “Recyclers bracing for deluge of devices: Switch to digital television e-scrap in Summit.”

*Akron Beacon Journal*.

“Fact sheet: management of electronic waste in the United States.” *US Environmental Protection Agency.*

*2005*. Web. 30 Oct. 2012.

Hubbert, Evelyn. “Cover Your Assets: Use IT Asset Life-Cycle Management To Control IT Costs.”

*Forrester Research, Inc*., December 24, 2008. Web. 30 Oct. 2012.

Leonard A. “The story of stuff. Referenced and footnoted script.” 2007. Web. 30 Oct. 2012.

Ravi, V. “Evaluating overall quality of recycling of e-waste from end-of-life computers.” *Journal of*

*Cleaner Production* 20.1 (2012): 145+. *Business Source Complete*. Web. 10 Oct. 2012.

“Reduce and reuse”. *US Environmental Protection Agency*. 2009. Web. 30 Oct. 2012.

Truini J. “Dell: Companies taking big risks with e-waste. (cover story).” *Waste News*. July 23,

2007;13(6):1-37. *Business Source Complete*, Web. October 10, 2012.

Williams E. and Kuehr R. “*Computers and the Environment: Understanding and Managing their*

*Impacts*.” *Dordrecht: Kluwer Academic Publishers*, 2003.

Zeigler, Jeff. “Properly handling end-of-life IT assets.” *Network World*. 12/17/2007, Vol. 24 Issue 49,

*Business Source Complete*. Web. 10 Oct. 2012.