MACRO CRITERIA IN I.T. PURCHASING

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We will start with a summary of general criteria that apply to most products. These factors range from the obvious to the arch, but how they are used, the weight that should be attached to each, and, ultimately, whether they should lead to a purchase decision can never be defined in advance. As you would expect, different criteria may apply in greater or less force to different products; multiple factors may be at work simultaneously; and factors that apply to specific products can overshadow general considerations. The reason to list the macro criteria here is to elaborate them in one place so that later they we can cite them only by name. We believe that macro criteria always apply in some proportion, but, aiming for the gist, we only can cite under Hardware and Software factors that we feel are most relevant to a broad consensus of opinion. You, of course, should decide yourself what weight to attach to all criteria according to your individual circumstances.

TCO

Total cost of ownership (TCO) includes not just the initial purchase price, but such factors as yearly maintenance, installation costs (setup time, need for extra ports, sockets, cables, adapters, desk space), training and learning curve, cost of technical help, environmental considerations
(noise, cooling, amperage), opportunity costs (re: alternative use of capital), downtime (loss of business, damage to reputation), security protection and vulnerability, storage, insurance, etc.[1] Not the least of these costs is one's own time in learning a new system, dealing with headaches that arise in compatibility and support, arranging for upgrades, and so on. If you assign a market rate to your own time, the TCO of a product can vitiate a common sense comparison of products made only on the basis of acquisition cost. And TCO can discourage the purchase altogether—the hyped set of features that grab attention may not be worth the cost over the life of the product.

Budget

The choice of products is only wishful thinking until there is a budget for the new product. We know that technology is constantly evolving, and a percentage of personal or corporate revenue must always be reinvested in equipment upgrades and replacement. Just as there is a difference in the decision criteria of Chevrolet and Mercedes owners, discretionary spending limitations impose a difference of opinion about what PC expenditures are justified. But as in Apple's AppStore, where many programs cost only a few dollars, quality does not always correlate with high prices.

Branding

Branding is important in any field, and the premium that the user pays for, say, IBM or Apple equipment, is not without economic justification—the prestige and satisfaction of owning the name band product and inference, sometimes misplaced, that the brand has quality lacking in a generic product. The market leader has a following of trained users ready to put the

product to work and happy to be using products that potentially advance one's employment credentials. The qualification, however, is whether this premium for an established product is worth the cost in comparison to competitive products that approximate or sometimes exceed the same specs. The old saw is: "No one gets shot for buying IBM computers." But just as there is no free lunch, there is always a price paid if high expenses prevent the organization from growing as fast it should; these costs have to be recouped through increased prices that detract from the company's competitiveness and thereby make both investors and employees suffer in terms of growth opportunities.

Redundancy

Though subject to budgetary constraints, it is always wise to purchase somewhat greater capability than one needs at present, because as new products evolve they tend to require increased everything—speed, memory, storage, bandwidth, resolution, etc. Even though the user may not need the enhanced capability right away, it is safer to acquire it from the beginning than to go back and learn that one's processor, operating system, disk space, and so on were inadequate.

Redundancy applies not only to future hardware requirements, but also to resources needed for peak loads, outages, and backups. Especially in storage, all the eggs should not be in one basket. Hard disks fail and become corrupted, sometimes before the problem becomes known. Malware, fire, theft, flooding, tornado, hurricane, and earthquakes present risk to the entire installation, and it is important to have more than one data repository containing regular backups. The most likely risk, however, is human error, including one's own mistakes. Accidentally deleted files, installation of incompatible software, reckless security practices, and coffee spills are only some of the dangers.

Cloud versus local computing

The amount of internal hard disk storage is still important, but becoming less so now that you can offload large files to thumb drives (now 512 GB to 1 TB), SD or microSD cards, and cloud services like Dropbox, Box, SugarSync, Amazon Cloud Drive, Microsoft Sky Drive, and Google Drive. These services are free for the first 1-10 TB. Additional storage is available on a paid basis, but at least one's most important data files can be uploaded to these sites without cost. Then again, system-wide disruption on a LAN, WAN, or remote site means that cloud computing, however convenient most of the time, is always uncertain at other times, perhaps when you most need the data. Urgency of the task, availability of printouts, and portable storage are main variables that might determine the extent to which you can rely on cloud computing.

Warranty/Maintenance

A one year warranty, which is all that you would get for free with a Dell, Lenovo, or HP notebook obviously conveys a message radically different from the "life of the product" warranty than SanDisk offers for its SD cards, though even here, there is an upper limit—ten years. In a sense, a warranty, especially an extended warranty, is an insurance policy fraught with huge exclusions that can be overlooked until the claim is decided against you. You need to

know if the warranty is limited to a manufacturing defect or can be upgraded for accidental damage.

Technical support

Whether from bugs, conflicts with other programs, or unclear documentation, you may have need for the vendor's technical help. Among the factors that will affect your TCO, as well as peace of mind, are the amount of time required to reach a support specialist, whether the call incurs a fee, and whether the vendor has outsourced the support to foreign nationals who speak English in a barely intelligible accent while reading a robotic script. Similarly, an ostensibly low price from an Asian vendor can be offset or overshadowed mangled English, time differences, and cultural disparities that appear when you need customer service. Before purchasing a product, you should sample how long it takes the vendor's technical help department to even answer the phone—then you will surmise what headaches await you, and you may pick a different product. For the same reason you should visit the vendor's Web site and observe what updates are currently available and at what cost. Observe, too, the oldest operating system for which drivers are available. If the drivers go back only to recent versions of Windows, plan on a future period of obsolescence within the same length of time. Unfortunately, some of the best vendors fall short in this area, such as HP in scanner support or Lexmark in laser printers. Asus on the other hand maintains a 24 X 7 support line with little more asked than the serial number of your model.

Proprietary interfaces

Vendors like to coral you into a proprietary interface which will require their continuing upgrades and accessories in the future. The difficulty of moving to a competitor who may offer an attractive price or set of features is a deliberate, though common means of securing customer loyalty, and you should resist whenever you can. Long-term, your interests tend to be best served by using industry standard products so that you are not locked into one vendor or circle of followers, but instead can move data and employees easily to future products that command attention.

Apple is an example of how brilliant products can pull customers into the sway of non-standard products, but generally the choice is one between products with a temporary advantage poised to become distinct disadvantage in the future or a safe bet on a product that may cost more than the "upstart" or seem less flashy than it for the time being. Whether the upstart will lead to a new standard is a judgment call that cannot be avoided. Often the choice is not just between close competitors, but whole constellations of products, such as Z-Wave v. Zigbee in home automation or iOS v. Android, and the ultimate winner is not immediately apparent.

Diversity of the marketplace

It is important to recognize the diversity of the market, not just in choice and functionality, but, first and foremost, in intended uses for the product. There also is diversity in expected duty cycle of products, raising issues of replacement cost and sudden loss of data. Finally, there is diversity in the support and replacement policies of different vendors who may have no

obligation to follow prevailing policies of U.S. vendors.

Active v. passive consumption

An extension of the notion of diversity, but worth emphasis is the disparity between content creators and "passive" consumers of it. Content creators need special authoring tools that are not in the mainstream work of clerical workers, customer service representatives, sales people, and home-makers. Yet, these distinctions are not absolute, for a Hollywood cinematographer, an eminent content creator, might never edit "dailies" of the work product, or a government worker who processes forms all day may go home and use sophisticated editing software for video of the family vacation.

Reliability of the vendor

A judgment call is always needed about which company has caught an upward or downward draft. You always have to decide whether you should take advantage of disruptive technology that could improve your market position, or whether you should select an established vendor in hopes that it is not going to shut down before the warranty expires. Reliability is not the same as its prominence, as we have seen in successive releases of Microsoft Windows, each requiring an endless stream of patches and "service packs." Nor is current market size an indication of tomorrow's leaders, for Apple, Google, and others were once small. However, for support, enhancements, compatibility, and assumed longevity, the choice between an established company and upstart usually tilts to the company with the best track record.

Vendor uniformity

Standards theoretically achieve interoperability among devices, allowing you to choose a product with the best price or feature set. Nonetheless, there can practical reasons to acquire products from the same vendor. First, your time is at a premium, and it is in your interest to reduce complexity—as in planning, installation, training, data migration, etc.—wherever possible. As Thoreau said in *Walden*, "Simplify, simplify, simplify." For example, a camera from the same vendor who makes your router may have button that you can hold down to connect the devices effortlessly. Secondly, if you have a problem installing a product, you may not know where the problem lies, and a vendor who makes the same items that you are trying to connect will be more knowledgeable and willing to assist than if you have to ask about integrating a competitor's product. Going back to the days when IBM dominated the PC industry, there was an old game of always blaming the "heterogeneous" product when configuration issues arose. Then vendors for their own convenience gave Microsoft drivers to distribute with Windows, and Windows enforced a large degree of interoperability, except where either user or vendor failed to keep Windows updated. Old habits yet linger, and vendors are likely to test and update compatibility most thoroughly with their own product line. On the other hand, not even the largest vendors necessarily have the best product in every category: your job is to select the most useful product within broad objectives.

Learning curve

How long it will take you to learn a new product should be researched from the beginning. For example, Photoshop, CAD, video editing, and database programs tend to require skill and patience, without which the purchase will be wasted. Each major revision of a program typically will require new learning on your part, learning which is continuous over the life of the product.

Extent of usage

Along with TCO, the feature set, and difficulty of using the product, one of the most prominent criteria in product selection is the extent to which the product will be used. Obviously, it makes little sense to spend "a fortune" on a product that will be little used or whose payoff in terms of facilitating a task never equals the effort and opportunity costs of learning the product. Vendors like to overwhelm you with the advantages of the product, but if you use it so seldom that these advantages are only theoretical, you have been talked into a bad bargain. The question therefore must be asked whether you need professional tools or whether a low-end product will serve your needs. The qualification is that you may derive personal satisfaction from completing a difficult task or from gaining a job skill that at a future point, perhaps too far away to be foreseen, could be extremely rewarding to you. These considerations favor the high-end product; frugality and immediate opportunity costs may argue a low-end product, especially since you later can upgrade and might even receive a discount for a competitive upgrade.

Where to go next

The next menus navigate to factors specific to individual product categories.

NOTE

1. See: http://en.wikipedia.org/wiki/Total_cost_of_ownership.