THE LIMITS OF PROGRESS

The competition in the computer business is now fierce. This is true in both the software and the hardware sides of the business. Prices of computers with major computational power are being pushed ever lower. Software packages embody ever more functionality at no additional cost. The inevitable question that crosses one's mind is whether or not there is an end to all this and what that end will look like. We may know soon enough as signs are beginning to appear that suggest major problems with the state of this world.

In the computer hardware business there are now computer systems which are very capable computationally and very complex operationally and which sell for very small amounts of money. The prices are now so low that the computer companies cannot afford such amenities as having a salesman talk to you. Yes, profit margins are getting so thin that sales calls are out of the question. Salesmen can only be used to make calls on people who are buying systems in the $100,000 range. Systems in the $10,000 range are sold by telephone or from retail representatives.

One needs to keep in mind that these lesser systems contain operating systems that are every bit as complicated as the operating systems on the larger machines. Should you wish to have a FORTRAN compiler on your computer you can expect to have it cost you extra and you can expect to do all the work which a systems programmer formerly did in installing this compiler on your computer. You can also expect to experience a lot of uncertainty about what you are doing.

The other little surprise which comes with these low-cost computers is that with any computer with an operating system as complex as the UNIX operating systems are, there is a continuing stream of corrections which must be made. You can choose not to make them but you must always keep them in mind against the time when some uncommon event occurs for which you have no obvious explanation.

But I have overlooked possibly the most frustrating aspect of a very powerful, bought-by-mail computer. The system comes to you in pieces. You get the opportunity to identify and connect each piece of hardware to the basic computer. You are given instructions as to how to do this. Of course, you really do not understand the rationale behind these instructions but you are expected to blindly follow them into the files of the operating system. Here one runs into the question of what I like to call one's own personal 'comfort level'. How comfortable are you when you are mucking about inside the operating system of a computer? What do you do when you actually damage this carefully preloaded operating system? Whom can you call?

Unfortunately I think that we all know the answer to the last question. You are basically on your own. For a fee I am certain that the company which made the computer can have someone come in and bale you out. By this point you have very probably consumed a few weeks of time and you have nothing to show for it. The reason why you bought the computer in the first place may be all but forgotten. Your forward progress toward whatever scientific goal you were pursuing has come to a halt and all of this has occurred in the name of some sort of progress. The true cost of this computer is not the price you paid for it.

The world of commercial software packages needs to be approached cautiously as well. There are many high-level graphics packages now on the market. They are advertised as being for a certain type of computer. Let us assume for discussion's sake that you, the user, have such a computer. What problems could you possibly confront in buying such a package?

0920-654X/$ 5.00

The obvious place to start is to read the fine print in the advertisement as to exactly what piece or pieces of special graphics hardware must be operational on your computer. This is the part that they usually warn you about. The part which you discover later is that you must have a certain version of the operating system and the window manager installed or the package will either work poorly or not at all. In some cases you are told that you must have installed certain obscure patches to the operating system which can hardly be called common information. It goes without saying that once again you find yourself in the systems programming business as you attempt to bring your computing environment up to the requirements of the package.

There are many other forms of software problems. These always occur when one piece of software or hardware must interface with another company's product. Molecular modelling systems currently on the market often interface with many other pieces of software. A common module with which they interface is the MOPAC system. What the user often does not suspect is that they may only interface with MOPAC at the version 5.0 level. QCPE only distributes MOPAC at the version 6.0 level at this time. What happens to someone who buys such a system and then comes to QCPE for the MOPAC system? MOPAC 6.0 may possess some slight incompatibility with the system that has been purchased. In the case of certain packages this problem has already occurred. MOPAC is merely being used as one example of this problem and certainly not the only one. Unless the user is very knowledgeable about computing systems and is prepared to do all the needed interface work himself, he has a major problem.

In an effort to reduce costs and simplify their lives, the computer manufacturers and software producers are systematically offloading a large amount of overhead costs onto the users. The manufacturers and producers are certainly in a much better position to deal with this overhead than are the users in most cases. From a societal point of view this is a very inefficient way to go. From a short term profit point of view this approach is very seductive. However, from a longer term point of view this approach could be deleterious to virtually everyone concerned.

The situations that have been described above must certainly lead to frustration and uncertainty on the part of the users. Such an environment can certainly not be expected to boost sales. Has anyone thought to evaluate the possibility that at least part of the sales slump in computers which is now so evident comes from just this situation? In industry around the world and especially in the computer industry the trend is to shed costs by shedding commitments. Everyone is 'downsizing'. Is it not possible that we might downsize ourselves out of business?

The computer industry is aware of the possible problems which it could be confronting. Conversations with many individuals indicate that what is going on is a carefully orchestrated program to test the limits of the scenario under which more and more of the overhead is offloaded to the users. The users in many cases have no organized appreciation of just what the current situation is but they are feeling the burden. No one seems to have some point in mind beyond which they can not or will not tolerate the current problems but such a point does probably exist. The question that the industry needs to ask itself is what the implications of going beyond this point actually are and how many of them would survive if this limit were breached.

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