The Trouble With Computers. . . .

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As you have no doubt noticed, we are trying something a little different at this year's meeting; we have invited several groups to share with us their experiences in developing and using computer supprt systems. My purpose here this morning is to give you some background information on why we're doing this and what we hope to achieve.

It's a surprise to no one that computer technology has been advancing at a fantastic rate over the past few years. What does surprise me, at least, is that it shows no signs of slowing down. It's hard enough to keep track of the advances being made each week, let alone trying to figure out what to actually buy!!! It's only too bad that other areas within our technological society have not made similar advances. I recently read a paper by a noted historian that suggested that if technology and productivity in other industries had progresses at the same rate as computer technology, a flight around the world would take only 24 minutes and Cadillacs would get 600 miles per gallon!!!

While such analogies may be true on the surface, they don't tell the whole story. For example, if we were to focus on other characteristics of this rapidly growing technology, we would find that our $600 Cadillac could only be driven by certain individuals, could only use one type of gas; would have users manual that only a few people could read or understand, and it would be extremely difficult to get anyone to ride with you!

At the same time our analytical capabilities are increasing exponentially, costs are decreasing at a similar rate. Twenty five years ago it cost about $1.25 to perform 100,000 multiplications using a digital computer. Today, such a task costs much less than a penny. It's possible for an individual to rent time on an international communications network and send information virtually anywhere in the world at the rate of 40 million bits per second. This is roughly equal to 480,000 university professors talking at the same time.

These tremendous technological advances are not without potentially serios side effects, however. The nature and severity of these problems depend on where you stand. From my position, for example, a major problem with computers is that they are getting so affordable, and so easy to use, that it is getting very difficult to impress people with

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the fact that I have or can use one. On the other end of the scale are people like my mother who hates anything having to do with computers. She delights in sending me clippings of newspaper articles documenting major computer foulups. One of my favorites is this card that one of her friends received from a local store:

FINAL NOTICE!!

I am a computer. No one but me knows that you have missed your last payment. If I have not processed your payment within 10 days, I will tell a human.

I guess the most frequently encountered question asked by people interested in developing computer capabilities is "Given the rapidly changing technology, how can I possibly decide what computer to buy and even if I could, should I buy now or wait?" Though this question is well posed, the answer is quite simple. First of all, keep in mind that you are not buying a computer for the technology. You're buying a tool that can help you manage information and solve problems. Your needs in terms of computer technology are probably not changing very fast. Certainly not as fast as the technology. In short, if you have a need for a computer today; if a computer can save you resources today; you should probably have a computer today.

The other part of the question — which one do I buy? — is not really the right question to be asking. I think that most computer consultants would agree that the question of software should be addressed first. The quality of the software you use, and the way in which that software is integrated into your operation will determine the overall level of support that your computer system will give you.

You really have four options when it comes to software: 1) you can use existing programs with no modification; 2) You can modify existing programs to meet your own specific needs; 3) you can write your own programs; or 4) you can hire someone to write your programs for you. For general office functions such as word processing and mail processing, you will probably be able to use so-called "canned" software. For very specific or one time engineering applications, you may choose to do your own development or to hire a software engineer. For data collection and routine engineering applications, you may be able to use generic software modified to your specific needs.

In general, keep in mind that custom software is very expensive, takes time to produce, and may need continual maintenance. Generic or off the shelf software may be more difficult to use or more difficult to fit to your way of doing things. Remember, advances in software have at least kept pace with, and in many cases outdistanced, hardware advances.

Assuming that you have been successful in identifying the approp-

riate software strategy for your particular situation, all you have to do is go out and buy a computer that runs that software . . . right. Well it's probably not that easy. First, you need to worry about something called the operating system. It would be nice if all software could be used with all computers, but that is just not the case. And just finding a computer that supports the proper operating system is only part of the problem. Ironically, the actual computer may be the cheapest part of the hardware system that you will end up buying. Storage devices, input devices and output devices are also very important to the overall system and each should be considered in your plans to acquire a system.

There are literally hundreds of different types of computers on the market. Though in each class of machine the numbers are significantly smaller, the decision is still not an obvious one. There are many different schools of thought on the subject. Some of these are: 1) Buy the computer that has been around the longest 2) Buy the largest selling computer 3) Buy from IBM because they are IBM 4) Hire a consultant to recommend which computer to buy.

Well, this is about as far as we can go without addressing your specific needs. A useful thing for you to do at this point is to talk with the folks who have been there before or who can provide equipment and software to help with your problems. For this reason we have asked a variety of computer users and vendors to share with us what they are doing. In addition to the exhibits on display in room 206 throughout the Road School, there will be some special sessions on a range of computer-related topics according to the following schedule. We hope that you find the exhibit and sessions useful and informative.

70TH ANNUAL PURDUE ROAD SCHOOL
Special Computer Sessions
(Room 206)

Tuesday, March 6

4:00 pm — MHM Associates, Inc. South Bend, Indiana
            M. (Jerry) Mohajeri; President
5:00 pm — Schneider Engineering Corp. Indianapolis, Indiana
            Larry Arthington; Sales Manager
7:00 pm — Panel Discussion: The Pitfalls of
            Computerization

Jeff R. Wright;	Purdue	(moderator)
John H. Allen;	President	Econoware
		Boulder, Colorado
Mark W. Coe;	President	CT Technologies

Tom McMahon;	President	CCST
		Incorporated
		Cannon Falls,
		Minnesota
Harvey Lis;	President	VL Systems, Inc.
		Irvine, California

Wednesday, March 7

10:00 am — The Right Amount of Technology
        Harvey Lis; President, VL Systems, Inc.
11:00 am — Bernardin Lochmueller & Associates, Inc. Evansville, Indiana
        Keith Lochmueller; Principal
3:00 pm — VL Systems, Inc. Irvine, California
        Harvey Lis; President
        Bob Mazziotti; Programmer/Analyst
4:00 pm — CCST Incorporated Cannon Falls, Minnesota
        Tom McMahon; President
5:00 pm — Econoware Boulder, Colorado
        John H. Allen; President
7:00 pm — Panel Discussion: What Lies Ahead?

Jeff R. Wright	Purdue (moderator)
John H. Allen	Econoware
Keith Lochmueller	Bernardin Lochmueller & Assoc.
Tom McMahon	CCST, Inc.
Jerry Mohajeri	MHM Associates, Inc.
Harvey Lis	VL Systems, Inc.