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Computers in Extension: Thoughts for Decisionmakers

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COMPUTERS IN EXTENSION:
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by

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INTRODUCTION

Last fall I attended several meetings on the use of computers in Extension and the College of Agriculture. The purpose of this paper is to pass along some of what I heard and learned.

One of the best workshops was the "National Microcomputer Idea Sharing Workshop" held in Lincoln November 26-28. This workshop covered many topics including microcomputer education, microcomputer use in County Extension offices, administrative and office use of microcomputers, demonstrations, and work group sessions. Approximately 30 states were represented. Another important meeting was the "NCCI Third Annual Technical Seminar" held October 30-November 1 in Madison, Wisconsin. I have a 2 inch notebook from each of these meetings which I will be willing to share with those interested.

Most of the discussion about the use of computers and policy are the product of the Lincoln Workshop. The comments concerning software come primarily from the NCCI Technical Seminar.

HOW DO YOU HANDLE INQUIRIES ABOUT COMMERCIAL SOFTWARE SUCH AS FARM ACCOUNTING?

Most states indicated that they do not have the resources to evaluate commercial software for the end user. At North Dakota State University the Advanced Farm Management classes are looking at several packages. They plan to write a report of their experiences.

North Dakota also has about a half dozen packages they use in Extension computer workshops where participants have an opportunity to run them. Others not in a workshop or class are referred to articles in Doane's, Agricomp, or other computer publications. Texas A&M and Cornell University also refer inquiries to computer publications.

Colorado State University leaves the responsibility of any software review to the various subject matter specialists. Some specialists review software and publish reviews. Little was said as to the amount of reviewing done but it apparently is not extensive.

WHAT IF ANY IS YOUR STATE'S POLICY ON AUTHORING DISTRIBUTION AND SUPPORT OF SOFTWARE?

The answer to this question runs the spectrum from none to full support. The University of California offers no software to the public and will not support any university developed software which may find its way into the hands of the public. California has had problems with some users modifying programs so they promote a particular product under the guise of unbiased information from the university. They likewise have had quotes from Extension and research publications taken out of context for

similiar purposes. With publications it is relatively easy to prove original and full intent of the author. With computer programs it is difficult to discover and protect the public from product alteration. Colorado like California is not developing software for the public.

Oklahoma State University and Purdue have a policy of selling and providing support for software developed. This is proving to take more resouces than anticipated. Keeping records of who has purchased software and then informing the buyers of upgrades and corrections is a major task. The University of Flordia has a software distribution center which handles support. The Flordia participant said they too find providing adequate support to be growing out of hand and are reconsidering their policy. Kentucky has chosen to support the County staff only. Any support to the general public is handled by the county staff.

Washington State University is no longer providing software for microcomputers to the end user. Any software developed at WSU for the end user is now going onto AGNET where the content of the program can be controlled and the user always gets the latest version. Washington does develop and support microcomputer software for use in the County Extension offices where its use is controlled by the county staff.

Clemson University has developed a few programs. They are finding a problem of which brand(s) of hardware to support. Resources are not sufficient to make programs available for all machines. When a popular program is developed, users want it available for other brands which is beyond their capacity to provide. Other states who have released microcomputer software to the public expressed similar reactions from the public.

Nebraska is testing the idea of free transfer of software from a remote bulletin board system (RBBS). This idea was just started last fall. There have been some hackers tampering with it and it requires daily supervision to prevent unwanted programs such as "How to Destroy a RBBS on a Commodore" from appearing. On the Nebraska system, anyone is free to load on a program as well as load one off to his/her machine.

QUALITY CONTROL OF SOFTWARE

The representative from UCLA-Davis to the National Microcomputer Idea Sharing Workshop was also concerned about the quality of programs going out from the staff at universities. What kind of review process is needed before software is released? How does one make sure the program has been adequately tested? How does one prevent unauthorized modification? While these are important questions each university needs to answer, time available and a full agenda did not permit much discussion on these topics.

LOCAL AREA NETWORKS

Local Area Networks (LAN) were discussed briefly. LAN is a term used to describe the linking together of several microcomputers into a functioning system. The specific topology of a LAN will vary from one installation to another, but all have some common characteristics. At least one of the micros is designated as the file server. In this unit the data files and programs are stored for use within the system. The other units are called work stations. The users at the work stations can access the data files and software located on the server. Thus the purpose of the LAN is to share common files and, if legal, share software located on the file serving unit. This means that only one set of data files and software need to be maintained instead of one copy for each user.

Those with some experience felt that LANs are currently too expensive for County Extension offices. There is still considerable room for improvement in both hardware and software. Clemson is installing one in their Ag. Econ Department. Washington has a Corvus system and said they cannot get the support they need. The system works poorly. File sharing has been troublesome. Kentucky and Michigan State University are looking at less expensive ways of sharing expensive peripheral equipment than using a LAN system. An example is using a gang switch to allow the sharing of one printer among two or three microcomputers.

Several states in the North Central Region are waiting for the results of the network recently installed in the SDSU Computer Aided Instruction (CAI) Center before spending much on a network. This LAN consists of an IBM-XT and 7 satelite IBM-PC's each with 128K of RAM and a single disk drive. The XT is the file server and holds the software and other files for the students using the system. Students can call down copies of software and/or their data files to the work station and operate as though they had the whole system to themselves. When done, they can save their data on their floppy disk, the XT's hard disk, or both. They cannot make copies of the software which resides on the hard disk so copyright laws are not violated. The system is working out very well. Both students and staff are happy with the design and operation of the system. The cost of this system is very low, with it being installed for about $22,000. Today it would cost less since prices of equipment have decreased.

COMPUTER EDUCATION IN EXTENSION

Several ideas were shared on computer education. One thing that several states have tried and learned does not work is mass training. To be effective in computer education, classes must be small with no more than two individuals per computer. With more than two individuals, the less aggressive or confident individuals will let the other(s) learn while he/she watches. Most people don't like to display their inability in front of

others, even fellow classmates. What has worked well is to have twice the number of participants as micro units and then divide the group in two small groups. One group receives lecture instruction while the other has hands-on experience.

North Dakota, Iowa and Nebraska have traveling workshops which consist of a van, two educators and several microcomputers, projectors and other necessary equipment. They will hold two-day workshops at a location giving participants considerable amount of hands on experience. They have found that it takes a minimum of two teachers to conduct a successful workshop.

The University of Nebraska has a campus staff of five microcomputer specialists who do much training across the state. These specialists concentrate in one of the following areas: word processing, spreadsheet analysis, database management, integrated packages and program coordinator. Nebraska also has three part time people who serve specific areas of the state. These part time people are farmers who know computers and offer training sessions for other farmers and train County Extension staff.

To facilitate training for the general public in Nebraska, a microcomputer association was created. This organization is an independent nonprofit corporation which operates with a letter of understanding with the University. It consists of a number of small user groups which meet monthly to share experiences and ideas. The association owns the equipment used by the university staff for training. The association is free to buy and trade equipment as needed to keep current with technology. It obtained its orginal seed money from loans from idle funds in the County Extension offices. The funds have all been repaid to the counties. The local user groups will often have a computer specialist as a guest to address a particular problem the group has. I can send to anyone interested a copy of the "Constitution For Nebraska Microcomputer Association."

The University of Minnesota has been primarily concerned with educating the county staff. County staff come to St. Paul for training at the time the county gets its microcomputer. The participants set up their machine and learn how to use it from the ground up. Only three counties receive training at a time. Then after two months, they come back for a second training session.

WHAT KIND OF COMPUTING SYSTEM(S) DOES EXTENSION NEED?

The general consensus of the participants was that Extension needs an effective "distributive computing system." This means having local computing for those things that can be economically computed and maintained locally. It means using a mainframe timeshare system for storage of large data banks which may need frequent updating and for running programs which need close supervision or control. The timeshare system will also serve as a data collection and dissemination point. Thus, data which need to be collected from a wide geographical area may be first

assembled on a local micro and then transmitted to a central mainframe for further processing, redistribution and storage. Examples of systems to meet these needs are EXTEND in Minnesota, WISPLAN in Wisconsin, TELEPLAN in Michigan, and AGNET in Washington, North Dakota, South Dakota, Montana and Nebraska.

EQUIPMENT AVAILABLE TO ASSIST IN EXTENSION EDUCATION

Several pieces of equipment and software are of extreme value in Extension and classroom education. First, are portable microcomputers with two disk drives or a hard disk, communication capabilities, and enough RAM to handle sophisticated software. Second, are computer driven projectors. These are essential tools for computer education. They are also essential when a computer is used as a tool in other subject matter areas. Three brand names for these projectors are Sony, Electrohome and LimeLight. These units replace the small CRTs or TV monitors. They project the computer created images onto a large screen much like a slide or overhead projector.

Projectors The Sony is a color projector and can handle video tape input. It comes with a fixed focal length and image size. It works well in a semi lighted room. Reports I received indicate that this unit is suitable in a classroom where the unit can be permanently installed. However, the unit is difficult to move around and set up for short meetings. Setup time may be an hour and a half or longer. The Electrohome and LimeLight are monochrome units with a variable focus length. These units are easier to move around and set up under various conditions. The Electrohome has a problem focusing on a flat screen and a curved screen is highly desirable. When used with a 10 foot wide or larger screen, a nearly totally dark room is needed. The LimeLight is supposed to allow for focusing of the four corners as well as the center providing a sharper image than the Electrohome. I have no information on its power or intensity.

Polaroid Slides Another highly usable piece of equipment is the Polaroid Platte Computer Image Recorder. This unit will generate instant slides of what is on the video screen. It does not take a picture of the screen but generates a like image on the slide film. The resolution on the picture is controlled by the hardware in the computer rather than by the monitor. The microcomputer must have a color graphics card with relatively high resolution to avoid fuzzy pictures. Care must be taken to use contrasting colors or the image may be hard to see when the slide is projected. If one is careful about choice of colors and does not try to put too much on a slide, they work quite well. Development time is one minute. You must develop a whole roll of film at a time.

Printers A number of high speed "letter quality" printers are now on the market. The price tag on these is surprisingly low and some do excellent work. I have original samples of their products for anyone to inspect.

The Box The University of Nebraska has developed a control box for County Extension microcomputers. The box will turn on the power to the computer any time of the day or night. This will allow for the programming of the computer to perform routine tasks at night such as reading and printing electronic mail or obtaining information when the phone rates are lowest.

The box will turn the computer on when anyone calls the phone number associated with the computer. This function will allow remote users to call the county computer to leave or pick up a file without leaving the computer turned on all night. The use of this box will reduce the charges for AGNET when performing routine tasks such as pulling reports or forwarding financial records from the county. It will also eliminate the need for staff members to be present to perform the task. This product has been built and tested. It will go into general use in 1985. The cost is under $200 each.

COMMERCIAL SOFTWARE

Software such as Pixel Visuals, PC-Crayola, PC-Picture and others are handy tools for developing transparencies for overhead projectors and slides for the computer run projectors. Prices vary greatly as do their features. Some are easier to use and others allow for animation with the big color projectors. A number of software companies are giving substantial price discounts to educational institutions. While these discounts may be as high as 80 or 90 percent, they do not necessarily reflect adversely on quality of product. Some of the best have very large discounts on some very high prices. (The University of Minnesota was buying Supercalc at 90% discount.) Also in most cases, the buyer no longer needs to confirm that the software will be used solely in the classroom, rather only that it is used for educational purposes. The Extension classroom qualifies as classroom use and the Extension qualifies as part of the University for many companies.

Integrated program packages have created some excitement among microcomputer users. Examples of integrated packages include Symphony, Smart Series and Framework. The advantage of these programs is that the user has only one program to learn and data and information generated by one program can be used with another. For example, data generated and stored in a database manager can be used by the companion spread sheet program and word processor.

Users who have had some experience with these integrated packages are now raising some flags of caution. One of these--the difficulty of learning an integrated package can be great. New learners can easily become lost in the total package and become highly discouraged. It may be easier to learn more than one separate package.

Each integrated package has its own strong and weak points. As these packages were put together, compromises had to be made.

Thus, one may be strong in mathematics but weak in word processing. Another may be strong in word processing and weak in mathematics. A third may have its strong point in database management and be weaker in one of the other two areas. Thus, one interested in an integrated system may want to review several and make her/his selection based on what his/her major needs are.

All these integrated programs are expensive. Suggested retail prices run from $300 to $900, although considerable educational discounts are available for universities including the Extension Service. The hardware requirements are large. Most programs advertise a minimum of 192K to 384K of RAM. To work properly, one generally needs 512K to 640K. Symphony and Framework load entirely into RAM so they need the upper limit for good operation. The Smart Series needs less memory because it does not load the whole program into memory. Rather it writes to disk as often as needed. The large disk access requirement makes a hard disk or card disk highly desirable, although two floppy 360K drives will handle most jobs.

Symphony is one of the hardest to learn according to the reports I have received. It is however the best when it comes to number crunching. Framework is championed as being the most desirable for people working with ideas and concepts because of it word handling capabilities. The Smart Set is an easy one to learn and is somewhere between Symphony and Framework in both mathematics and word processing.

NOTE TO LOTUS 1-2-3 OWNERS IN THE UNIVERSITY! Lotus is offering you a chance to upgrade your Lotus 1-2-3 package to Symphony for $200. Don't waste your money. Educational institutions can upgrade for $80.

I have "crippled" copies of both Framework and Smart Series which I can duplicate and send to anyone upon request. These copies will allow you to see how these programs run and what they can do. Being crippled, they will not allow you to use them for your work. I have just received a copy of Smart Series and will be willing to share my experiences with the program.

Windowing may offer a more economical alternative for some users. Windows enable users to view two or more selected portions of application programs on the screen at the same time. The user can usually move data back and forth among the windows or edit any or all of them. Some windowing programs allow for automatic updating of dependent data in another program. In essence, windowing is like having the papers of two or more projects on your desk at the same time and being able to move the information on them electronically from one to another. Windowing allows you to use the programs you already have so it eliminates the cost of replacing the programs with which you already are familiar.

CLOSING REMARKS

As I look at where SDSU stands relative to other universities in the region, I come to the conclusion that South Dakota State University is in a position to make significant contributions in advancing computer use and innovation. This applies to teaching, research and Extension. The LAN system in the CAI Center is one example of what can be done in teaching. Electronic data acquisition by the Agricultural Engineering Department is an example of leadership in research. To aid Extension and research, SDSU is a member of the AGNET computing network where large databases of highly valuable information relating to agricultural production, management and marketing are stored and maintained. It can serve as the needed core for an economical distributive data processing system. AGNET is the most economical way we can provide state of the art management and decision making software for all brands of microcomputers, at a reasonable price to the user. We can provide software which is consistent with the educational programs of our Extension specialists and readily incorporate the latest research findings in ways that are readily applicable to the farm and ranch environment.

If Extension is to assume a leadership role in computer education the most critical need, as I see it, is to adopt the use of the computer in the various areas of Extension education. Our clientele must see us using the computer to solve the problems on which we are working. They need to see how to use the computer as a mamagement tool. It is no longer sufficient to teach about the computer.

Dakota State College is currently offering classes to farmers in how to buy and operate computers on the farm. AGNET staff have been doing the same. But these activities are not sufficient! Now is the time to begin showing our clientele how to employ the computer in solving the problems of management. With the computer much more information is available to the manager. But he/she must know how to use that information. As one farmer said to me, "I don't know how to use all the information available to me so I don't use it (the computer) as much as I could." Currently it is only the most imaginative and innovative who are gaining the benefits of the computer which should readily be available to all.

There are some immediate costs to be considered if we are to choose to lead. For one thing, there must be investment in retooling by some specialists. This involves learning to use computers in their work. It may mean discovering different approaches to the problems with which they work. During the retooling process their immediate in-field productivity may well decrease. But this additional education must be looked upon as an investment for greater productivity in the future.

A second cost will involve capital expenditures for equipment. There are four items which are necessary. The first is a

portable microcomputer. A specialist cannot learn how to use the computer as a teaching tool by merely reading about it. He/she must have one on which to learn and take to his/her classroom. He/she will also need a projector for the classroom when more than 3 or 4 are there for instruction. These projectors allow the clientle to see what is being done and how it is done which is what is so important in using to learn a computer. A third capital expenditure will be a modem to access the mainframe computer databases and software and a fourth item is software for their microcomputer.

A move toward greater leadership will require the AGNET staff to take a leadership role in providing education in computer software development. By this I mean providing education for specialists in software development which is consistent with their teaching objectives. This does not mean teaching a program language, but rather teaching how to organize and structure a computer program for a programmer/analyst to code.

As I see it, we are now at a point to assume new leadership. We can avoid the mistakes of the early innovators and gain from their successes. There are many more opportunities than we can begin to exploit so we must choose some and leave the rest for others to use or ignore. It will require new work for most all of us. It will require careful allocation of funds as well. But the choice is ours.

I have gathered much information on the topics discussed above and will be willing to share this information with anyone who is interested. As a result of the workshop in Nebraska, a conference on National Microcomputer Sharing has been set up on AGNET. All AGNET users are welcome to read and respond within the conference. Please contact Kent Scofield or me if you need additional information (Phone 688-4141).

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Smart Series is a registered trademark of Innovative Software.
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