

Artificial Intelligence

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Artificial Intelligence

Abstract

When Don Breneman called me last January to participate on the " New Technologies" panel, I eagerly accepted. I have a habit of eagerly accepting responsibilities that are half a year away. In June, responsibilities accepted in January have a way of causing perspiration and I don't believe that has anything to do with the weather in Fargo.

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Some of what I’m going to show you and tell you about may seem far afield from a communicator’s role. I’m not going to deal with writing, editing, or broadcasting. When our organization changed its name from Agricultural College Editors to Agricultural Communicators in Education, I believe we accepted a broader role. Therefore, I challenge you to consider seriously the importance of artificial intelligence and particularly the expert systems and natural language opportunities. Maybe those are the wrong names to describe the software needed to make high-tech things useful, but that’s what we have to work with.

I’m sure I was asked to be a part of this program because Purdue University was involved in a 15-month study to evaluate the potential for artificial intelligence in agriculture. James Morrison, a communications research specialist in our department, was project leader for that study. Our Purdue group made an initial, visual, and verbal report during the land-grant meetings in Washington, D.C. last November.

Many of your experiment station and extension directors may have returned from that meeting and asked you to find out more about artificial intelligence or to get a copy of the slides we used. I’m happy to tell you that you may purchase a complete copy of the 90-minute video tape for \$35.00.

The Purdue study outlined three major areas: 1) natural languages, 2) robotics (intelligent machines), and 3) expert systems programming.

The author is head of Agricultural Communication Services at Purdue University, West Lafayette, Indiana. He has been an ACE member 24 years.

Natural Languages

Natural languages offer the promise to communicate with computers in whatever language and dialect the user feels comfortable. Natural languages along with robotics, or automated machinery, might bring us full circle on the farm. That is, we might use "giddy up," "gee," "haw," and "whoa" again. More pertinent, would be the ability to shout "STOP!" as the corn picker cylinder tugs at a loose fitting shirt sleeve. Think about the possibilities. The development of natural language computer interfaces is certainly one place where communicators could have major influence.

Robotics

Contrary to popular depiction, R2D2 characters are not about to become household servants. However, automated equipment is much more possible and likely to become a part of our lives. The objective is to free us humans from dangerous or routine tasks and to make other tasks easier.

A simple illustration of an automated device is the automatic transmission. Most of us rely on this device to make decisions for us about when to shift gears on our vehicles without any question. I remember when the first "fluid drives" came on the market. We doubted that anything could replace manual control gear selection. Now, that just seems so automatic.

Expert Systems

The Purdue study stresses the opportunities in this area for agriculture. That is the consensus of the group from Purdue and the members of the applications panel assembled as a part of the project.

What are expert systems? They are an outgrowth of a line of artificial intelligence research begun in the mid-1960s. An expert system is a computer program that, when presented with a series of facts, follows a set of rules and reaches conclusions similar to a human expert. (Think about extension specialists or researchers in your state who complain of overwork or not enough time to deal with all those problems that need their attention.) The system consists of three parts: 1) a data base (facts), 2) a knowledge base (set of rules used to compare and interpret facts), and 3) an inference engine (to

apply knowledge to act on the situation)

Fredericks: Artificial Intelligence

Until recently, expert systems required fancy, expensive computers and fancy, expensive programmers to run them. However, the good news is that the technology has advanced to where some expert systems are available on micro-computers.

A number of software companies are beginning to talk about expert systems programming, particularly their data base managers. Much of the knowledge needed for an expert system might already be available in stored data bases. As a communicator, how might you be able to help your audiences make better decisions if they could query your university's weather data base and determine if it might be best to plow a little wet today rather than hold off until the next forecasted rain and find it too late to plant a crop? Or, armed with a set of cabinet specifications and room sizes your home economist could teach the concepts of dimension space planning. Would you find that as satisfying as editing and distributing an 8-page publication that attempts to teach such material?

Overwhelming

These innovations are likely to be time consuming and resource intensive. This, it seems to me, is where communicators can help influence the future. For years our specialists and agents have encouraged farmers to make major changes in their operations, yet, to a very real extent, we cling to our old ways of doing business in universities and extension services.

It may be dangerous to our continued health to be all things to all people. Or, put another way, something for everybody may not be operational much longer!

Can we use this new technology, select specific audiences, and concentrate our efforts to make an impact? My understanding of the early years of extension indicate that the local county agent was the respected source of expertise in the community. He or she was, to be sure, a generalist. But they knew more about most things than their clients. That's not so anymore. The agents are still generalists and all the problems encountered by their clients require specialist knowledge, but with a systems approach.

Could it be that electronic technology (maybe in the form of expert systems) might return the county agent to center stage? Armed with the electronic wherewithal to provide answers, maybe even sprinkled with educational nuggets,

might we stretch our limited resources to satisfy the demands? Will we communicators expand our horizons and embrace the truly educational opportunities offered by these new technologies?

(At this point, a 10-minute segment of the 90-minute video tape on artificial intelligence was shown.)
