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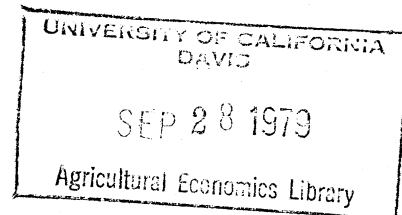
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*Farm
management*

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ABSTRACT

The Implications of the FACTS System for
Farm Management Extension and Research

by Ed Carson, Farm Management Extension,
Purdue University, March, 1979

Indiana Department of Agriculture

The FACTS system is an interconnected system of "smart" computer terminals linking the counties of Indiana and the agricultural departments at Purdue with each other. The system is expected to multiply the farm management extension program significantly. The system must perform well, gain agent and farmer acceptance and staff support.

Contributed Paper, AAEE and WAEA Annual Meetings

Pullman, Wash., July 31, 1979

The Implications of the FACTS System for
Farm Management Extension and Research^{1/}

By Ed Carson, Farm Management Extension Staff,

Purdue University, March, 1979

The Fast Agricultural Computer Terminal System (FACTS) is an interconnected system of computer terminals with limited memory capacity which also interface with the large Purdue University Computer Center (PUCC)^{2/}. The computer terminals have the capacity to both process data and/or store information on a stand alone basis and to transmit and receive data/information to and from other terminals and/or the large computer. (28K memory) The system includes the requisite system software and applications software (much of which is still under development). The projected design calls for a terminal in every county in Indiana (if local funding is provided), in every area extension office (ten locations) and in each department in the school of Agriculture.

Longer run consideration is being given to providing access to other data systems (TELPLAN-Michigan, Computer Management Network-Burroughs Corp., etc.). On the input side, as experience is gained consideration will be given to allowing other potential users to have direct access to the system (local county offices, farmers, ag-businesses, etc.).

Where are we now?

As of this presentation the department and area terminals are installed along with about 75 county terminals. About 70 of the county terminals and all of the area terminals are connected to FACTS via telephone line.

The system can now send messages from one county (or area) terminal to one or more other terminals. (Departmental terminals are expected to be tied into the system shortly-they require different hardware.) Shortly

data processing through the central computers (MIRICL, PUCC) should be possible.

Every department has at least one, and in a few cases more than one, computer model that will operate on a stand alone basis. The current "menu" is as follows:

1. Farm Building Plans Catalog (AgEg)
2. Farm Equipment Calculator (AgEg)
3. Double Crop (Agron)
4. Installment Land Contracts (AgEc)
5. Rate of Return/Present Networth (For)
6. Ration Retrieval for Beef (AnSc)
7. Feeding Programs for Horses (AnSc)
8. Garden Planning (Hort)
9. Green House Costs (Hort)
10. Budget Program (Cons)
11. Food Costs (Cons)
12. Real Estate Tax Generator (AgEc)
13. 4-H Enrollment System (4-H)
14. Weather Reports (Agron)
15. Mail (Communications) (AgIn)

In addition 2 Ag. Econ. models are near final form:

- Maximum Bid Price Calculation on Land Purchase
- Income Tax Management for the Farm

And two others are close behind:

- Grain Marketing Model
- Farm Planning and Financial Management.

All of the above but the last one are "stand alone." It and several other models that will require processing by PUCC are in various stages of development.

What do these Developments mean to Farm Management?

The Shorter View

In the short run FACTS means shifting resources to program conversion and development, agent training and creating farmer awareness. This means less resources for on-going programs which as a result means a decreased

farm management education impact.^{3/} As an offset to the reduced staff time it is possible that, as FACTS gets under way, we will have a more receptive audience. Our limited experience to date indicates that the "new gadget" stirs up a high degree of interest, both on the part of agents and farmers. We had more agents in a recent training session than ever before and since then more agents have shown interest in learning how to use the Financial Management Budget than ever before. Plus, those that have used the "Tax Management" (Patrick), "Land Purchase" (Dobbins) and "Grain Marketing" (Uhrig) models indicate high farmer interest.

These increased time demands fall on both the extension and research staffs in-as-much as both (often in the same person) have been involved in earlier model development and both are therefore involved in the model conversions. We the staff, are often frustrated by the time it takes to get these jobs done and by the current shortcomings of the hardware of the system. We are putting in a lot and don't appear to be getting much back so far. But, we have made some progress (see below) and fully anticipate some more. Let's look at what those possibilities for the future are.

The Longer View

First, from a longer run view the development provides the possibility of multiplying our farm management extension education program rather dramatically. (as well as other program areas). Take a couple of examples. First, one of short-run impact, say an important market development. This information and an analysis could be sent to all

county offices within hours. The agricultural agents could have the information in the hands of farmers within a few more hours to a day or two (radio, TV, newspapers, letters). Second, on longer range problems assume that just the management agents (32) were to have reason to use a particular planning model once a week for a year. That is over 1500 applications of the model--significantly more than we are currently achieving. If, in addition, at least some of the Crop and/or Livestock agents were to use the model, the impact would be even greater.

The realization of the possibility of multiplying our efforts depends heavily on four key assumptions. First, that the FACTS system performs well enough to be accepted by both extension agents and farmers. Second, that the vast majority of the extension agents find the farm management models that are available both useful and useable. Third, that the model users--mainly farmers--find the available models useful. And fourth, that the farm management extension research staff give full support to the development, distribution and support of models for the FACTS system.

The impact could easily double and quite possibly quadruple the effective educational impact of our efforts. While it is quite likely that it will not be possible to fully measure this impact, it should be reflected, at least in part, in the statistical reports of extension agents. Are they in fact spending more time on what they classify as "farm management" work?

However, that added impact is not going to be free. As agents have greater access to newer and sharper tools (models) they are going to need more and more intensive training on the background, use and interpretation of those models. Some of this can be handled by adequate documentation but at least some of it is likely to involve formal, face-to-face training, either group or individual. This will also provide our staff with an opportunity for

valuable feed back.

Service vs. Extension

Let me at this point inject an aside regarding service vis-a-vis extension. It would be easy to presume that working through a computer decision model with a farmer for his farm was a service rather than education. He would be required to follow a logical process, often be required to review (analyze) past activities, often be required to consider alternatives. He would be faced with considering (the consequences) of various alternatives. He could be faced with the impact of marginal increments. All of those add up to farm management education. If the agent works with him, those "teachable moments" can be expanded upon. Our educational efforts can be enhanced if we are able to successfully develop our models in a management framework - a framework which causes the user to really think about problem identification, to consider the alternatives and their consequences, to decide on the basis of the maximization of this satisfactions and to evaluate the outcome.

Probabilities

What are the probabilities that the above assumptions will be realized? At this stage it is very difficult to assess them. In a sense, to date, we have, by our agreement to support the FACTS effort, indicated that we believe that success is probable. But, we all have some reservations. There is no "shining example" of success for farm management education via a computer system that we can point to yet. There have been degrees of success (TELFARM, CMN, and a few others) but none that have been outstanding. So what is different with FACTS? How are the assumptions likely to stand up here?

The System

First, the system itself. The author is convinced that in spite of its problems (delays, slowness), the FACTS system will still be the best system that has been available to date. Further, the author believes that the dedi-

cation is there to overcome the handicaps as rapidly as possible. The question then becomes "will it be good enough?" The author believes it will be, at least for the near future. Better, faster, cheaper hardware will soon be available, if it isn't already. That will be a challenge for our administrators. But, in the meantime the present system will do the job for a while.

Extension Agents Adoption

Will the extension agents use the farm management models? This depends on essentially two elements (which really become one). First, the extension agent must perceive the models as useful, and it must be in a form that he feels is useable-he feels comfortable about using it. Second, there must be some farmer demand for what the model does. Now, in part the agent creates that demand by informing farmers that the model is available (which goes back to the first element). But farmers create the demand for a model(s) when they indicate they have a question which the agent recognizes can be addressed by the model. The author believes that we already have several models that meet the requirements of agent acceptance and answering farmer questions. Our challenge is to develop and distribute additional models that meet these same criteria. An important element in this process is to involve the agents in new model identification and design. The challenge to the research staff is to either be ready with or to develop the materials needed for those models.

The author does have one concern about agent acceptance. That is, will the agents with their fragmented duties, find enough time to learn to use anything more than the simplest of models? He is not overly optimistic about the answer to this question for a significant number of the agents.

There is at least one other implication for extension agents. They may increase the proportion of direct group teaching that they do. With ready access to the terminal they may conduct more local workshops (probably with small groups) using a model that they have learned to use with confidence.

They may call on the specialist for the first time or two but after that they are quite likely to "go it alone," particularly if the main emphasis is on the model. They might even "campaign" a "model-a-year" with several groups of participants.

Farmers Acceptance

Will the farmers accept and use the educational aids available via FACTS? If we provide useful and useable models, and if a continuing effort is made to make farmers aware of those models, they will accept and use them. Agents will "recruit" farmers by identifying a farmer question that has "model using" possibilities. Once a farmer has had successful experience, he will help spread the word. The fact that we have had considerable success with several thousand farmers with the Crop Model, Farm Planning and Financial Management, the Swine Model and several other smaller models should certainly aid in obtaining initial farmer interest in FACTS. Now that the FACTS terminals are well on their way to being in place, every effort should be made to obtain a news release announcing each new model as it becomes available. In addition a radio release and a TV release would also be appropriate.

In the author's opinion, farmers acceptance will rank third in difficulty of these areas.

Farm Management Staff Support

If the extension agent and farmer acceptance of FACTS Farm Management models is dependent on the models (their content and their structure), then it follows that the burden falls on the farm management staff. Farm management staff support for the FACTS project is necessary at several levels. First is support in conversion of existing models to FACTS which primarily involves consultation with the programmer regarding the choice of stand alone vs. call-up (PUCC), formats, help messages, details of the model, and preparation of the "how to

use this model" portion of the documentation which includes interpretation of the results. To speed up the programming process, as noted earlier, it may be desirable for 2 or 3 staff members to learn to program in MUBASIC.

Second is training of the agents to use and interpret these converted models. At the initial stages this has required training in the use of the terminal as well as in the use of the model. But, most of the training on use of the terminal is past.

Third is the selection and/or development of other models^{4/} for use on FACTS. Based on experience elsewhere and on our own thus far brief experience, it is important that we generate models that the agents view as useful. This is likely to pretty well take care of itself. Agents have already made requests for several different new programs and they will undoubtedly think of more as they gain experience. Some of these models can be obtained from elsewhere. Others will need to be written from scratch. One of our challenges will be to determine the priorities for such models, particularly those for which a given agent may see great use but which may be of little interest elsewhere. In addition, of course, we must continually seek to discover new problem areas for which we can develop models that will provide useful answers. Obviously, accompanying such new models would be the need for agent training with respect to those models. Finally, and by no means least will be the need to support existing models once they are first released to assist agents in both problems of inputting data and in interpreting results. As time passes data will need to be revised, models changed due to changing conditions, and improved as experience provides new insight. Ultimately the degree of success of Farm Management via FACTS will depend on the support of the Farm Management staff.

While agents may do a higher proportion of direct teaching than they now

do, specialists may still do as much or more than they have been doing. They will be called on to help in the "start up" phases of more workshops of more kinds than at present, and perhaps with a wider range of agents. If this occurs the question is left as to where the resources will come from to meet this need. Perhaps some of the resources will come from less time spent on year-after-year repetition of the same educational programs. Perhaps the agents will take over some of that task.

The author can not say with absolute sureness whether the farm management staff will or will not provide enough support to gain the maximum educational impact possible through FACTS. But, his judgement is that the probabilities are strongly in the direction that they will.

Some Future Challenges

There are at least two potential developments that require comment at this point. One is external, the other is essentially internal.

The internal challenge is the integration of our various models so that they achieve as high a degree of interface as is feasible.

That is, that when a farmer desires to use a model, as much of the data he needs as is possible is drawn automatically from his records and any other relevant models that he has recently used, plus any relevant data banks. The Doster-Kehrberg-Floyd efforts are a step in that direction, but this work has a long way to go. But, with FACTS, with the possibility of farmers having disks of their own data, and access to the large computer the potential for such an integrated structure is closer than ever before.^{5/} Our challenge is to be ready.

The external challenge is in the form of computer hardware-specifically micro-computers. Micro-computers are now coming on the market that have the memory capacity of a FACTS terminal, can process data faster, cost less, and can do so in color! So far, any given model has one or another short comings that do not make it a substitute for a FACTS terminal (ex-printer speed). But, they are being bought by a few farmers, and people in the industry think they will be bought by a lot more. That remains to be seen. The USDA "Green-Thumb" project^{6/} and the recent Control Data Corp. interest in small farmers further challenges the imagination. The open question at this time is how these developments will affect FACTS. Will these units essentially allow for by-passing FACTS (and Extension)? Who will provide the software for these units? On what terms?

It is the author's view that this is an area of evolution, not revolution. Over the next several years only a small percentage of farmers will acquire micro-computers. The author suspects that in some cases vendors will develop programs of their own; others will obtain them from other sources, including universities. In a few cases farmers will develop their own. But, when it comes to complex problems and complex models farmers will still turn to the Extension Service for guidance.

One other related development is the programmable calculator. For the moment the capacity of the calculators is limited enough that they do not compete with the capabilities of a FACTS terminal. However, it is quite likely that within just a few years the same store will offer a programmable calculator with the capacity of a small micro-computer right alongside a small micro-computer both priced at less than \$500 (current dollars). Therefore, we'll need a FACTS model to help decide which one to buy!

FOOTNOTES

1/ The author wishes to express his appreciation to Paul Robbins and Craig Dobbins for reviewing the original draft and for their helpful comments.

2/ Technically the interface is to the FACTS central computer which interfaces to PUCC either directly or via the MIRICL system.

3/ While the shift of staff time to FACTS has been significant (approaching one man equivalent over the first year), there has been an even greater (absolute and proportionate) shift of computer programmer time to converting models to FACTS. While additional funds have been made available from the FACTS project for programming, we have elected to use an even greater amount of programmer time for FACTS. The result has been a net reduction in programmer time available for other department activities in the short run. However, this still leaves a problem in that there continues to be a substantial need (demand) for programmer time for work on FACTS models, well in excess of the time available. This problem needs further attention. The author suggests that as one alternative two or three staff members might learn to program in MUBASIC, the FACTS language, to temporarily meet some of the current demand.

4/ Development of a model in this context includes not only writing the program but the full range of activities required to have it accepted for FACTS use including documentation of input and interpretation of output plus any necessary agent training.

5/ To clarify, in this authors view, just because one might have access to nearly infinite data does not mean that (a) it would all be used to solve every problem, nor (b) that all the possible information would be dumped on the farmer. Rather, the idea would be, for a given problem, to gather all the available data from likely sources, and then let the farmer modify and add to that data as needed, and present him only with the results required for the problem (with even some choice there).

6/ A project (pilot) to put a computer unit in every farmers home that ties to a larger county unit, tied to a state unit, tied to a USDA computer. Designed to be a two-way system-information to farmer, data sent by farmer, plus data processing. Kentucky is a pilot state.

Biographical Sketch

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Extension Economist at Purdue University from 1955 to
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