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## **Extension on the Brink - Meeting the Private Sector Challenge in the Information Marketplace**

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### **Abstract**

**The Cooperative Extension Service is facing unprecedented competitive pressure in the information and education marketplace. As data are combined with knowledge to create information from which revenue and value can be gained, private information providers are placing Extension at a competitive disadvantage. As information customers reassess their needs and place higher value on convenience and access over objectivity, several questions must be answered. Chief among them: Can Extension and the Land-Grant System survive and succeed in head-to-head competition with private information providers, or will the system be most successful as a wholesale source of information and education in partnership with private-sector information providers?**

**U.S. farmers are insatiable consumers of information. New ideas and techniques gleaned by farmers from both the public and private sectors have driven U.S. agricultural productivity during the past half-century.**

**Now, as the recently passed changes in farm support and subsidies begin to take effect, information used in decision making is more critical than ever.**

**Information is increasing in value almost as fast as the amount of available information. As information value skyrockets, the question facing public providers of information is: How do we compete in this new and evolving information marketplace?**

**Cooperative Extension may, indeed, be on the brink. Extension's role in the information marketplace will determine its ability to compete.**

This paper offers our professional communication and agricultural economics insight on information marketplace competition and what that means to the potential future success of Extension and the Land-Grant System.

## **Background**

Land, labor, and capital have been critical to financial success for farmers in the past. Now, the relative importance of information is increasing also (Drucker, 1992; Peters, 1992).

As the relative value of information increases, sources of that information are changing as well. Farmers have more choices, are better educated, and farm larger tracts of land than previous generations. Public information sources such as the Cooperative Extension Service may have dominated in the past, but information from private sources, such as agribusinesses and commercial crop and market advisers, now offers strong competition. To be sure, competition has been a part of the overall information marketplace for some time. Now, however, we are seeing competition from private information providers increasing at a time when Extension is least capable of meeting the competition because resources are being reduced or at best held flat.

In many cases, agribusinesses offer critical information along with sales of key farm inputs. Ease of access and no apparent extra cost to the purchaser create strong competition for public-sector information. These private-sector information providers place the Extension Service and USDA/Land-Grant University System at a significant competitive disadvantage in terms of providing user-specific knowledge and information.

U.S. agricultural producers rate traditional public information sources, such as county Extension agents and even university specialists, significantly lower in usefulness than many other sources of information for production, marketing, or financial decisions (Ortmann et al. 1993). Dramatic changes— both in the value of information and the preferred provider of that information— may reinforce this credibility problem.

Analysts with a decision-theory focus emphasize the role of data in decision making (Bessler, 1979; Arrow, 1980; Fishburn, 1970; Morgenstern, 1963; Eisgruber, 1978; Simon, 1975). They suggest that data have value in proportion to the economic benefits of an improved decision. This argument has been at the base of most Extension information delivery for years.

However, the rapidly increasing amount of data creates what Theobald (1987) calls “infoglut.” This acceleration creates in turn a significant opportunity to add value if you know specific needs of individual audience members and know where or how to find the information to help them address those needs.

## **Components of Information**

Information means different things to different people. For the purposes of this discussion, we propose a new series of definitions based in part on historical definitions with long-standing tradition and also on newer definitions which address the current information marketplace environment.

In this new series of interrelated definitions we distinguish among three important factors:

- Data
- Knowledge
- Information.

#### Data

Data are specific and individual numbers or observations, or individual ideas or concepts. Data can be quantitative or qualitative in nature. Research and observation, both public and private, generate data.

#### Knowledge

Knowledge is broad based and can be applied across many circumstances. It is not specific or unique; rather, it helps one sort through the vast quantities of data available to determine what is relevant. Knowledge can be developed over time by observing and recording the effect of data on information. This activity is, in part, the process of learning.

#### Information

Information is different from data or knowledge in that it is audience specific and decision focused. In essence, if knowledge and data are combined with a detailed understanding of a specific audience (e.g., a particular producer) and applied to a specific decision (e.g., the proper level of fertilizer to apply to obtain a particular yield of a particular crop), they are transformed into value-added information.

It is a cyclical process (Figure 1). Knowledge and data connect with specific audiences to create information with significant value. When this information is used to make effective decisions, what is learned is factored back into the knowledge base.

The attributes that help determine the value of information include:

1. Impact
2. Specificity
3. Accessibility

Each of these three factors interacts at the decision point to increase the importance of information. All three are required for the value of information to increase as rapidly as we currently see in agricultural production and management decisions.

Paraphrasing Naisbitt (1990), we are drowning in a sea of data, but we are starving for information.

#### Customers as Drivers in the New Information Marketplace

Competing in the information marketplace is relatively new to public-sector information providers. However, competition is a reality.

Particularly critical questions for public information sources such as the Extension Service include: Who are the customers, what do they want, and when do they want it? In contrast to most private information suppliers, Extension has done little customer and market analysis. Much Extension information is organized and packaged to reflect the disciplines or fields of faculty and specialists, rather than designed to solve the problems of customers or audiences.

Extension professionals do have personal contact with their customers or their audiences. However, they do relatively little audience segmentation and tailoring of their information to specific individual customers.

Compounding the concern, publicly generated information tends to be more generic and broadly applicable than privately generated information. One perceived audience—taxpayers as a whole—drives this. The thinking is that if taxpayers have funded the generation of information, then the largest portion of that audience possible should benefit directly. Thus, specifically targeted information, which has higher value but to a relatively smaller group of individuals, appears to be less of a priority.

In many instances Extension specialists respond to user critique of an information product which has already been delivered rather than anticipating user needs and making changes in advance, as private-sector competitors are likely to do. Extension professionals do little effective market research that would enable them to know individuals within their audiences intimately enough to anticipate their individual needs.

Because of 1995 changes in the federal agricultural support structure, some experts advise producers to hire more private marketing and production consultants. Commercial crop and marketing advisers are motivated by the need to survive economically. Being responsive to the most specific questions from customers in a timely fashion is one way to ensure survival.

To date, Extension has not competed favorably in terms of ready accessibility with private-sector vendors of information (particularly with electronic market information), whose convenience motto is “anytime, anyplace, anywhere!” However, providing computer-based electronic access to Extension educational information holds some promise for public-sector information’s ability to compete.

Extension and the Land-Grant System do bring two overriding strengths to the customer— objectivity and overall accuracy. (Although some observers even question objectivity, with many agricultural research projects funded by private agribusiness corporation grants.) But these attributes alone may not counter the relative value of convenience and ease of access of the private-sector information providers.

Extension faces difficult questions when attempting to be customer responsive and competitive with private information providers in the information marketplace. Can we develop adequate personal contact with the information customer to provide timely, acceptable, and useful information? Or would such personalized contact require resources well beyond most public-sector budgets?

What about unpopular messages—safety messages and information about regulations messages? How do we effectively deliver messages and information that the customer may not know about or even want to receive, particularly when the customer is paying for it? And how might those messages be changed (i.e., softened or even misstated) if the end user gets them from someone who has a stake in not offending them?

### Capturing the Value of Information

Much of the information farmers have received in the past has been distributed through mass media formats, such as radio, newspapers, farm press, and similar media. Extension information has been disseminated in this fashion, as well as in publications and at meetings that parallel mass media in that they are generic rather than narrowly targeted to audiences.

We are in the midst of a shift from this distribution paradigm. Typically, information has been physically delivered to the end-user, usually as print-on-paper publications. We are now moving to an access paradigm providing customers greater access to ever-increasing amounts of knowledge and data.

Immediate access is a driving force in audience satisfaction. As public-sector “deliverers” of information cope with becoming ready-access sources of information, the competition will become keener. Information sources having the greatest value—public or private—will be the ones which more accurately anticipate the complex matrix of needs, wants, and motivations of their audiences—typically even before audience members themselves fully recognize it. Is this an area in which Extension will be competitive?

Information needs of farmers are becoming more specific to each farming operation and geographic location. There is a significant growth in electronic distribution systems and computer-based access. Information and messages are electronically available through satellite and Web-based communication systems to producers in their homes and offices. This will expand to their cars, trucks, tractors, and combines in the near future.

The challenge is how to combine existing information distribution systems with more personalized access systems that provide specific messages or information. For example, corn growers need different messages than hog producers, and cattle feeders need different messages than milk producers. Information for some is noise to others.

To effectively capture the value of information and compete successfully in the new information marketplace, Extension must provide specific messages to more narrowly defined groups of producers much as private consultants do now. The traditional Extension mass-media message will be too generic for producers who have unique growing or production needs. Extension has the technical capacity to provide personalized messages, but does it have the human and fiscal resources to determine what specific bits of data and knowledge combined into what information (i.e., what message) individual producers need? If Extension chooses to compete, the challenge will be to tailor information to individual users.

### Changes in Structure and Coordination

As information becomes a more important source of strategic competitive advantage, those who have access to it will be more successful than those who do not. If funding for public-sector research and information dissemination declines, alliances of firms with contract-coordinated production, processing, and distribution may be able to generate proprietary knowledge and technology. This will allow integrated operations to more easily capture and create innovators' profits while simultaneously increasing control and reducing risk. This gives a formidable advantage to integrated contract-coordinated production systems and is a detriment to smaller independent producers.

Public information providers will face questions concerning open access to their knowledge and information (i.e., Who gets the information and at what cost?) because of growing concerns about economic/political power of differential access to information.

Also, the ability to screen, sort, and massage data into information will be critical. There are likely economies of size in the process. Larger scale firms are likely to have more effective internal resources to solve this dataglut problem. Smaller scale firms may be more dependent on public information services to perform this sorting and processing function.

Some communication analysts continue to predict that concern about "haves and have-nots" in the Information Age will become less of a problem as overall access to information increases. However, when it comes to increasing value, it will not be a question about whether producers have access to the data, as much as about the ease of access and ability to process data into information. Extension has traditionally provided more universal access to information, which has helped shrink the gap between the information "haves and have-nots." This may not continue.

With the increasing value of information and its use as a strategic competitive advantage, there is less free exchange of data and information and the issue of who owns the data and information becomes critical.

For example, with site-specific soil information—who owns the information—the operator who paid for it, the service company that gathered it, or the landowner who has title to the property? Can a farmer obtain this information from one company, such as a fertilizer dealer, and then provide it to a competitor who might have a lower price on fertilizer? Does it make a difference if farmers pay for the service, how much they pay, or if the information service is provided as part of a bundled package with the product? If coordinated production systems have the potential to obtain superior information, how can independent producers who are not part of that system obtain access to similar information to remain competitive? Will they need to become part of the system to obtain access to the latest information to be competitive?

The intellectual property rights debate has historically focused more on research and development innovations protectable under patent or copyright law. Particularly in agriculture, the public sector has played a major role in the research and development activity and thus provided broad access to new technology and ideas.

Part of the public-sector information providers' purpose was developing and disseminating new ideas in a sufficiently broad fashion so that a wide spectrum of users benefited and so that individual firms could not restrict access and capture the value associated with the new idea. In other words, one of the public sector's roles was that of leveling the playing field so that all participants have access to new ideas and information.

It has long been assumed the value of information cannot be established using typical market economics. As long as information flow is unfettered, its value can be multiplied but seldom subtracted in the typical market/sales sense. If someone sells an item, he or she has less of the item and more money. But if information is traded, the provider can retain the full value of the information, even as the receiver acquires it (Schramm & Porter, 1982). However, if information access is restricted, this equation can change dramatically.

As more data generation comes from private-sector firms and more information dissemination and access systems become privatized, individual firms have the potential to restrict access to new ideas and information to particular users. This will favor some producers and exclude others from the ideas, technology, or information necessary for them to be competitive.

The concepts of intellectual property rights, including patent and copyright law as applied to agriculture, were developed in an era of domestic markets and national firms; a relatively large information dissemination system; and a limited role for information as a critical resource. Now, however, the world has changed.

#### Market Driven Pricing Incentives

With a public-sector distribution system that does not charge for information, the user captures most of the value of that information—particularly the early adopters—and over time the final consumer captures most of the benefits. Charging for information can provide the incentive to make it more valuable by making it more specific and decision focused.

The issue of charging for information services continues to be controversial in Extension programming. Traditionally, Extension programs are free, or there is a nominal charge. This is based on the traditional premise that public, tax-generated funds have been used to support the information development and dissemination system, so that charging for services would be a form of "double billing." This premise may be eroding as we see user-fee structures emerge in other publicly funded operations such as National Parks.

Information, like any resource, has a supply and a demand function. Market-driven pricing, based on the demand function, is based on the value of information. Understanding this could help in making decisions about how to allocate scarce Extension resources. Pricing for services may not only assist in recovering cost, it may provide significant data on how to allocate resources to Extension programs with the highest potential of satisfying customer needs.

While pricing Extension programs can make a significant contribution to a more consumer-driven public information system, this does not necessarily preclude Extension Services from subsidizing information delivery to customers

who cannot pay. It may, in fact, make such subsidies possible. However, the question about the appropriateness of competing directly with commercial consultants remains to be resolved.

### Public/Private Linkages

The rapid growth in the number of private information providers raises important questions concerning the potential linkages between public- and private-sector providers of information. The issue of Extension becoming a wholesaler rather than a retailer of information surfaces.

One possible way to approach this issue is to return to the concepts of knowledge, data, and information defined earlier. The public sector probably has a comparative advantage in access to knowledge. In contrast, the private sector probably has a comparative advantage in data gathering and analysis to provide targeted information.

To be useful in decision making, knowledge must be integrated with data to create information. Public/private-sector linkages would allow each sector to exploit its comparative advantage. Combining the analysis and integration capacity of the public sector (the knowledge component) with the gathering and dissemination capacity of the private sector (the data component) could improve information content and the value of messages that producers receive.

However, in this type of public/private partnership, will the value of Extension in the equation be clear enough to decision-makers and their producer constituents to maintain adequate funding?

There is an interesting comparison to be made with the current home-computer market. For years we have purchased computers marketed for what they appeared capable of doing and by their outside appearance. That changed recently when the Intel Corporation began a campaign to help consumers identify machines that have "Intel on the Inside." Now what the machine appears to be able to do based on physical make-up (e.g., CD-ROM player, monitor size, floppy disc port, listed hard-drive size, etc.) seems less important than the electronic make-up of the silicon chip which drives it. The Intel chip on the inside is driving purchase decisions.

Extension is in a similar situation. It is the Extension and Land-Grant knowledge that is driving the thriving information market for private information providers. How can we make sure information consumers and decision-makers know there is "Extension knowledge on the inside" of the specific, highly valued information offered by private information providers? Can we convince potential private-sector partners that "Extension on the inside" provides a marketing edge on which they can capitalize?

### Recap

Information has become a greater source of strategic competitive advantage. As the complexity and risk involved in food production become greater, the value of information used to make marketing and production decisions increases. As the value increases, so does the competition among providers of that information, both public and private.



Also, as the risk in agricultural production increases, information is becoming an ever more important driver of control and structural change in the agricultural industry. Access to information and intellectual property rights are becoming greater sources of conflict and controversy as information increases in value and as private-sector firms can capture that value.

Evolving technology allows information to be more detailed and more specific to the user, another reason the value of decision-focused information is increasing.

As public information providers continue to fight for resources, private information providers are becoming more active and aggressive in providing timely access to value-added information.

These are factors moving Extension to the brink. Our response will determine whether we are on the brink of failure or success.

### Continuing Questions

This is an on-going discussion. We offer these questions to stimulate the next level of discourse:

- What are the criteria for deciding whether Extension should continue to attempt to compete head-to-head with private-sector information providers or reposition itself as a knowledge or information wholesaler?
- How should Extension balance the benefits and risks of training and providing knowledge for private-sector consultants and salespersons— who then have one-on-one contact with producers and other information customers, thereby providing them more specifically targeted information?
- Will information accuracy and objectivity be compromised by increased linkages between public and private sources of information?
- Will producers and other information consumers who cannot pay be deprived of the latest information?
- Will the taxpayers continue to support public information services even when the original developers of that information are not politically visible?
- What if the information is wrong— who will bear the risk of errors and liability?
- Is this increasing competition with private-sector providers of information also affecting other parts of Extension and the Land-Grant System, such as Consumer and Family Sciences, 4-H/Youth, and Community Development?
- Who will step up to help address these issues in both policy and action?

### References and Related Readings

Arrow, Kenneth J. (1980). Economic welfare and the allocation of resources for invention. In *The rate and direction of inventive activity: Economic and social factors* (pp. 609-696). Princeton University Press: National Bureau of Economic Research.

Bessler, David A. (1979, May). On risk, information, and causality in agricultural markets. In *Proceedings of a Conference Sponsored by the North Central Regional Committee (NC 117), Studies of the Organization and Control of the U.S. Food System: Market information and price reporting in the food and agricultural sector* (pp. 92). Madison, WI.

Bonnen, J. (1975). Improving information on agriculture and rural life. *American Journal of Agricultural Economics* 57, 753-763.

Bonnen, James T. (1977). Assessment of the current agricultural database: An information system approach. In L. R. Martin (Ed.) *A survey of agricultural economics literature* (pp. 386-407). Minneapolis: University of Minnesota Press.

Burch, John G., Strater, Felix R., & Crudnitski, Gary (1979) *Information systems: Theory and practice*. New York: John Wiley & Sons.

Christy, Ralph D. (1994). Private strategies and public policies: The economics of information and the economic organization of markets. *Re-engineering Marketing Policies for Food and Agriculture, Food and Agricultural Marketing Consortium, FAMC, 94*, 6-18.

Cyert, Richard M., & March, James G. (1977) *A behavioral theory of the firm*. Englewood Cliffs, NJ: Prentice-Hall, Inc.

Dik, David (1988). Why wait until 2010? *Journal of Extension* 26(3).

Dobson, W.D. (1979, May). The adequacy of U.S. agricultural marketing and price information. In *Proceedings of a Conference Sponsored by the North Central Regional Committee (NC 117), Studies of the Organization and Control of the U.S. Food System: Market information and price reporting in the food and agricultural sector* (pp 1-14). Madison: WI.

Drucker, Peter F. (1992). *For the future: The 1990's and beyond*. New York: Dutton.

Eisgruber, Ludwig M. (1978). Developments in the economic theory of information. *American Journal of Agricultural Economics* 56(1), 901-5.

Extension Committee on Policy (ECOP) (1991, July) *FACT: Future application of communication technology*. Report published by the Communication, Information and Technology Unit of the Extension Service, USDA, Washington, D.C.)

Fishburn, P. (1970). *Utility theory for decision making*. New York: Wiley.

Grossman, Sanford J., & Stiglitz, Joseph E. (1976). Information and competitive price systems. *American Economic Review* 66, 246-253.

Morgenstern, O. (1963). *On the accuracy of economic observations* (2nd ed.). Princeton: Princeton University Press.

Ortmann, Gerald F., Patrick, G.F., Musser, W.N., & and Doster, D.H. (1993). Use of private consultants and other sources of information by large cornbelt farmers. *Agribusiness: An International Journal*(1), 391-402.

Perkins, Jerry, & Fitzgerald, Anne (1996, May 20). Gannett news service, farm law plows new, and old, ground. *Lafayette Journal and Courier*, 1.

Peters, Tom (1992). *Liberation management: Necessary disorganization for the nanosecond nineties*. New York: Alfred A. Knopf.

Porter, M.E. (1985). *Competitive advantage: Creating and sustaining superior performance*. New York: New York Free Press.

Purcell, Wayne D. (1979, May). Market information: Implications for subsector organization and coordination. In *Proceedings of a Conference Sponsored by the North Central Regional Committee (NC 117), Studies of the Organization and Control of the U.S. Food System: Market information and price reporting in the food and agricultural sector*(51-60). Madison, WI.

Naisbitt, John (1990). *Megatrends 2000: Ten new directions for the 1990s*. New York: Morrow.

Riemenschneider, Charles H. (1979, May). The economics of agricultural information systems. In *Proceedings of a Conference Sponsored by the North Central Regional Committee (NC 117), Studies of the Organization and Control of the U.S. Food System: Market information and price reporting in the food and agricultural sector*(pp. 15-28). Madison, WI.

Schramm, Wilbur, & Porter, William (1982.). *Men, women, messages and media: Understanding human communication*(pp. 266-270). Harper and Row.

Simon, Herbert A. (1975), Rational decision making in business organization. *American Economic Review*, 493-512.

Stigler, George J. (1961). The economics of information. *Journal of Political Economy* 69(3), 213-225.

Theobald, Robert (1987). *The rapids of change: Social entrepreneurs in turbulent times*. Indianapolis, IN: Knowledge Systems.