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## **Why is the 11 adoption rate by farmers so slow? (Summary of the EFITA '99 conference questionnaire and discussion)**

### **Introduction**

The Second EFITA Conference on Information Technology (IT) in Agriculture - EFITA '99 - was held in Bonn, in September 1999. The conference schedule and papers, their summaries and full texts are accessible at [www.efita.org](http://www.efita.org). The conference focused on a wide range of issues - among them the question: "Given that the benefit from IT is identified, proven and readily available why is the adoption rate so slow?" Slow was defined as the rate of adoption of computers, commercial software, Internet for extension and/or agricultural production - all compared to adoption potential. Adoption potential was defined as the number of active farmers in the EU and several other countries (Gelb et al., 1997). The issue was addressed in the conference in several ways: during a plenary presentation (Gelb, 1999); a dedicated session (Gelb et al., 1999); via a questionnaire for conference delegates including questions which were evaluated during

the conference and an open-session discussion ("discussion forum"). The discussion forum was based on participant's personal information and background material presented during the conference. In it the issues were oriented primarily towards and for the benefit of each participant's personal professional requirements. They were geared to encompass as many aspects as possible and not to reach a consensus. All these provided an opportunity to undertake a study exercise. The aim of the research exercise was to identify the beliefs of conference participants relating to IT uptake and summarize opinions on possible consequences should IT not be adopted for agricultural production and extension.

The initial rationale and justification for the exercise were the result of the fact that there are numerous, unsubstantiated, explanations for farmers' slow IT adoption rate. They include the various IT costs, farmer conservatism, system constraints and unfriendliness, etc. An in-depth study (Smith and Webster 1986) suggested that farmers are simply choosing non-IT

approaches based on their assumption of their superior performance in risk management. Additional reasons were evaluated during the Alberese workshop on IT Adoption examining Internet use for agricultural production and extension (Gelb and Bonati, 1998). They included technical problems, information not meeting users needs, gaps in knowledge, etc. This long list characterizes the extremely wide range and variation of possible explanations and underline the complexity of the IT adoption issue in general and the rate of adoption issues specifically. The readiness to participate encountered while conducting the study and the results justified the effort.

## Method

The views of conference delegates were elicited by means of the discussion forum and the simple free-form questionnaire. Delegates were posed the following questions:

1. What are the factors limiting the use of IT by farmers?
2. What are the factors limiting the use of IT by Extension working with farmers?
3. What are the factors limiting the use of IT by research working with farmers?
4. What are the consequences for farmers not using IT: Today and in the near Future:
5. What are the consequences for Extension not using IT: Today and in the near Future:
6. Should public funds help to finance Information Technology Services for Farmers?

Responses to all questions were 'free form' i.e. there were no constraints on the answers given. All responses were collated and organized according to a subjectively determined set of major headings. Space was left for further comments most of which were submitted and independently discussed in the discussion forum which was very lively and lasted for two hours.

The questionnaire included delegates' personal details such as Name, Country and Occupation which in turn indicated that the results do not consist a random sample or a "balanced" presentation. The spread of occupations did substantiate a currently relevant and unbiased evaluation of the questions.

## Results

There were approximately 70 delegates from more than 25 countries who attended the discussion forum. 58 delegates responded to the questionnaire. While the respondents' occupations varied there were no practicing farmers among them. The results should therefore be interpreted as "non-farmers" perceptions of what motivated "farmers". This survey is not in any way a summary of farmers' views.

Table 1 summarizes the main replies (the number of replies per category) to the first and major question of the questionnaire and indicates the number of countries where this reply was considered relevant.

Table 2 summarizes the replies to questions 1, 2 and 3 by comparing the number of replies related to each user category - farmers, extension and research. It should be read e.g. as follows: 15 delegates indicated that researchers lack understanding how farmers make decisions and consequently this is an impediment to researchers' use of IT in their work with

farmers. In this case "work" should be understood as information dissemination and development of IT based decision support tools such as models, real time simulations, etc. Only 4 delegates thought this consideration relevant for Extension workers.

Table 3 is from Gelb and Bonati (1998). It is included in this report as a quantifiable benchmark by showing, for comparison, a survey of the uptake of a specific technology - Internet - for a specific purpose - extension. Comparison of these three tables illustrates the points brought up in the discussion forum and relates them to the replies to the questionnaire.

Table 4 summarizes an assessment of the consequences for farmers and extension not using IT today and in the future.

Table 5 suggests that there is a role for public funding in support of IT services for farmers.

Following are some of the main issues that were voiced during the discussion forum. They should be evaluated in line with the summary of answers from the questionnaire. In brief there seems to be a questionnaire-consensus (re number of respondents and respective countries) that the main reasons for the slow rate of IT adoption by farmers are technological and infrastructure impediments, unclear benefits and cost. These seem to correspond to the perceived explanation of Extension's slow rate of adoption in some countries - a perception to be viewed as an indication only. There is universal agreement regarding the significantly negative consequences of not adopting IT for agricultural production by farmers and for extension by extension services.

## Comments from the discussion forum:

- IT adoption is a dictate of economics and a competitive production-environment. Consequently measuring adoption should not focus on the rate of adoption but on adoption effectiveness, relevance and compatibility with farmer's needs - as farmers see them:
- IT adoption rate and extent in fact exceed the recognized and reported indicators - IT is prevalent in many ways without being defined and/or reported as such -eg- outsourcing of data management and data services;
- Market forces will dictate the level of IT penetration - commensurate with customization, cost/benefit analysis and decision support capability. Uptake can be considered a question of economic efficiency correlated e. g. to market-information distortion and risk management:
- IT Costs and Benefits are subjective -eg- perception of what is the cost (loss of benefit) from available knowledge mismanagement;
- IT is management supporting and is adopted as a function of management's proficiency - better managers will be "better" adopters;
- IT is a threatening factor to middle management who, in turn, will bottleneck adoption;
- Agents of change will always lead the IT adoption process, takeoff will depend on other factors which will be decisive for the rate and depth of adoption;
- IT adoption in general and the rate of adoption are a function of a technology transfer gap - IT adoption will accelerate when "using IT" demonstrates a comparative advantage;
- IT uptake is dependant on the farmer's social pattern - the

rate of IT adoption will depend first on availability, convenience, friendliness and human engineering before content IT will be adopted when it is compatible with the farmer's intuition;

- Most farmer decisions are intuitive whereas IT decision support is normative;
- IT pricing, market differentiation and technical requirements suggest different answers to IT adoption rates for agribusiness, large-holding farmers and small farms IT adoption might be farm-size sensitive and/or farm size dependant but benefit potential might be size neutral;
- We do not have a conceptual framework to evaluate adoption-rate parameters efficiently. In many situations there is a large gap between knowledge available to the farmer and it's utilization. Understanding the reasons for this gap will help to explain the rate of IT adoption;
- "Cheaper IT" will probably correlate positively with IT adoption rate;
- External formalities will dictate IT use -eg EU regulations and reporting requirements;
- Market suppliers' strategies and national telecom policies may be a critical impediment to IT adoption in rural areas in general and agriculture in particular

Tab.1: What are the factors limiting the use of IT by farmers?

Limiting factors	Respondents	Countries
Inability of farmers to use IT	17	10
No perceived benefits - economic and others	16	8
Too hard to use/ unfriendly	13	7
Lack of Technological infrastructure	11	9
Cost of technology	10	8
Not useful Information/ not relevant problems	7	6
Fear of technology	7	4
Not enough time to spend on using technology	7	4
Do not understand the value of IT	5	4
Lack of training	5	5
Better alternatives	3	2
Personal impediments	2	2
Lack of integration with other farm systems	2	2

The following factors were listed individually without relating to a specific group: Lack of user confidence in the systems; mismatch between farmer and developer's perceptions; suitable system unavailability; lack of user involvement; no incentive; lack of confidence in results; unsatisfactory support by extension; lack of reliable data; lack of communication between users; resistance to change; external factors; fear of loss of job (extension); need for personal touch (extension); better alternatives; personal impediments; lack of integration with other various farm systems.

Tab.2: Comparison of factors limiting the use of IT by Farmers, Extension and Research.

	Farmers	Extension	Research
Inability to use IT	17	14	7
No perceived benefits - economic and others	16	6	
Too hard to use/ unfriendly	13	11	
Lack of Technological infrastructure	11	5	5
Cost of technology	10	11	11
Not useful Information/ not relevant problems	7		
Fear of technology	7		
Not enough time to spend on using IT	7	4	4
Do not understand the value of IT	5		4
Lack of training	5	8	2
Better alternatives	3		
Personal impediments	2		
Lack of integration with other farm/other systems, lack of suitable IT programs	2	11	8
Do not understand how farmers make decisions, low farmer demand		4	15
Irrelevant, no limiting factors			11

Tab.3: Critical success factors for Internet adoption for Extension.

	Score *
On farm accessibility	59
Information for farmer (extension) wants and needs	62
Compatibility to farmer's production technology	55
An identified tangible benefit	57
An identified and targeted audience	59
Understood and applicable information	62
Simple interface and easy to navigate search engine	58
Responsibility for information quality and reliability	61
Updated Information	63

(\* Note: the maximum score of 69 is a possible result of a survey of 23 respondents. Each respondent scored each factor with an "importance" rating of 1 to 3. The higher the score the higher the degree of importance. For full details see [www.efita.org](http://www.efita.org) EFITA PAPERS).

Tab.4: Consequence of not using IT today and in the future.

	Farmers not using IT		Extension not using IT	
	Today	In the future	Today	In the future
No consequence	19		5	4
Loss of competitiveness/ efficiency	19	28	31	14
Becoming "out of touch"	16	8	13	
Wasting resources	2		1	
Negative environmental impact	2	3		
Go out of business		8	4	15
Reorganization of business/ IT infrastructure		1	1	
Other	5			

"Other" future consequences mentioned include social problems, increased dependence on extension, missed opportunities, simplified transactions, inability to trace products through marketing chain and reduced potential for development (3)

The role of public funding to support the development and adoption of Information Technology and IT supported services for farmers is constantly prominent in public debate. The breakdown of the conference participant's opinions regarding this issue is shown in table 5. There seems to be an agreement that at least qualified public funding is desirable. The questionnaire summary did not however indicate "public funding" as a major limiting factor to IT adoption

Tab.5: Degree of support for public funding.

	Respondents
Support is essential	8
Support is justified	11
Support is justified with qualifications	29
Support should not be provided	12

**Discussion**

Comparison of points brought up in the discussion forum, the results of Tables 1 - 4 and assessment of the consequences of not adopting IT by farmers and extension supports the contention that IT adoption is and will be a critical success factor for agricultural production and extension. To the extent that farmers will "lose competitiveness" and extension will "go out of business". Table 5 suggests that it is in the public interest to support IT uptake. The EFITA '99 conferences' contribution to understanding IT uptake is significant in prioritizing the major constraints to IT implementation, currently relevant to the IT adoption process. These in turn suggest priorities for research and development. Hopefully these areas of interest will be addressed and developed along with studies designed to measure and evaluate farmers' opinions at source.

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**Why is the 11 adoption rate by farmers so slow? (Summary of the EFITA '99 conference questionnaire and discussion) (E. Gelb et al.)**

**Summary**

Participants of the EFITA-Conference 1999 were asked to discuss the slow adoption rate of Information Technology (IT) by farmers. Main answers were inability of farmers to use IT, no perceived benefits and problems with technological infrastructure. The consequences of not using IT will be the loss of competitiveness for farmers and especially for extension. To support development and adoption of IT public funding was discussed as justified.

**Key words:** Information Technology, EFITA, farmers, extension

**Akzeptanz von Informationstechnologie in der Landwirtschaft (Zusammenfassung der Ergebnisse einer Umfrage während der EFITA-Konferenz 1999) (E. Gelb et al.)**

**Zusammenfassung**

Auf der EFITA-Konferenz 1999 wurde eine Teilnehmerbefragung zur niedrigen Akzeptanz der Informationstechnologie (IT) in der Landwirtschaft durchgeführt. Die Gründe wurden vor allem in Anwendungsproblemen, unklarem Nutzen und Problemen bei der technischen Umsetzung vermutet. Als Konsequenz des geringen IT-Einsatzes wird sowohl für die

*praktizierenden Landwirte als auch in besonderem Maße für die Beratung mit dem Verlust von Wettbewerbsfähigkeit gerechnet. Der verstärkte Einsatz von Informationstechnologie in der Landwirtschaft sollte mit Hilfe öffentlicher Unterstützung gefördert werden.*

**Stichworte:** *Informationstechnologie, EFITA, Landwirtschaft, Beratung*

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