

USE OF INFORMATION TECHNOLOGY BY EXTENSION AGENTS IN KHUZESTAN PROVINCE OF IRAN

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Abstract

The main objective of this article is to present the results of a study done regarding the use of information technology by extension agents in Khuzestan Province of Iran. The research design was a correlative--descriptive method. A random sample of (n=96) extension agents who worked for Management of Extension and Farming System of Khuzestan province, Iran were selected for participation in the study. A questionnaire was developed to analyze level of information technology that used by extension agents. Face and content validity of the questionnaire was established using a panel of experts consisting of faculty in the department of agriculture at Shushtar University and extension officers in the Ministry of Agriculture. Reliability for the overall instrument was 0.78. The main result of the study revealed that approximately 17% responded their skills about IT to be "very poor" and approximately 68% responded their skills to be "poor". Approximately 89% responded that they use their computer, both at home and at work, between "0-5 hours a week". The results also showed that top five IT training needs for extension agents were: E-mail, Presentation software, Word processing, Spss, WWW. In this study, there was a significant relationship between the age, IT knowledge, position, income, social participation, attitude regard using IT and level of education with use of information technology by extension agents. Level of education, social participation, income, IT knowledge, position and attitude regarding using IT may well explain for 78% changes ($R^2 = .78$) in use of information technology by extension agents.

Introduction

Information technology (IT) has been used both in developed and in developing countries to support operational, tactical, and strategic processes within organizations (Abdulgader & Kozar 1995). IT is a general-purpose technology and thus has wide applicability in various manufacturing and service sectors. It has strong spread effects and extensive linkages with the rest of the economy.

There is a widespread belief that information is vital for rural development (Mchombu 1992; Gericke 1997; FAO 2000). Using information is a key issue in the information age. The real challenge of our time is not producing information or storing information, but getting people to use information. Information is a critical resource in the operation and management of organizations. Timely availability of relevant information is vital for effective performance of

managerial functions such as planning, organizing, leading, and controlling (Babu, *et al.* 1997). According to Maningas, *et al* (2000) information within the hands of the farmers means empowerment through control over their resources and decision-making processes. As FAO (2000) points out, information is critical for rural development because increasing the incomes of smallholder farm families will depend crucially upon raising agricultural productivity. According to Morris (2000) Rural communities, where agriculture is commonly the main activity, require information on inter alia, supply of agricultural inputs (seed, fertilizer), new technologies and innovations, early warnings (pests, drought disease) and credit facilities, markets etc.

Maningas, *et al* (2000) noted that being an effective and efficient delivery system of essential information and technology services, it facilitates the clients' critical role in decision-making towards improved agricultural production, processing, trading, and marketing. According to Morris (2000) New information technologies can educate and empower rural farmers and offer limited employment to locals but there are numerous constraints to the development of telecentres and utilization of the computer-based services that they offer. Most important of these limitations are the lack of information and computer skills in rural areas and the pressing survival needs of rural dwellers that relegate information to a luxury rather than a necessity.

Recently, the use of information technologies (IT), such as e-mail and the World Wide Web, has become commonplace. Information technologies offer the agriculture industry the opportunity to increase information flow to all industry participants at a decreased cost. Identifying the factors associated with IT adoption and use in agriculture will allow the industry, especially managers, to increase information flow and increase the demand for a firm's products and services, while increasing the level of trust in the firm. IT offers the ability to increase the amount of information provided to all participants in the agricultural sector and to decrease the cost of disseminating the information. Iranian farming community is facing a multitude of problems to maximize crop productivity. One of the reasons is that expert advice regarding crop cultivation is not reaching farming community in a timely and a wide information gap exists between the research level and practice (Ommani, 2005). Iranian farmers need timely expert advice to make them more productive and competitive.

Purpose and Objectives

The purpose of the study reported here was to investigate the use of IT by extension agents in Khuzestan province of Iran. The objectives were to:

1. Describe extension agents in Khuzestan province of Iran by demographic characteristics and describe their IT skills.
2. Determine how extension agents are using IT on the job.
3. Determine future IT training needs for extension agents.
4. Identify factors affecting use of IT extension agents.

Methodology

The research method employed was correlative-descriptive. A random sample of (n=96) extension agents who worked for Management of Extension and Farming System of Khuzestan province, Iran were selected for participation in the study. A questionnaire was developed to gather information technology used by extension agents. The questionnaire covered four areas: 1) demographic characteristics such as age, sex, and levels of education; 2) how extension agents are using IT on the job 3) future IT training needs for extension agents; and 4) extension agents'

attitudes and skills regarding use of IT on the job. Face and content validity of the questionnaire was established using a panel of experts consisting of faculty in the Department of Agricultural at Shushtar University, and extension officers in the Ministry of Agriculture.

The questionnaire was pilot tested in Tehran province. Questionnaire reliability was estimated by calculating Cronbach alpha. Reliability for the overall instrument was .78. Data collected were analyzed using the Statistical Package for the Social Sciences (SPSS). Appropriate statistical procedures for description (frequencies, per cent, means, and standard deviations) were used.

Findings

The following section present finding by objective:

Objective 1

The first objective was to describe extension agents in Khuzestan province of Iran by demographic characteristics. Approximately 41% of respondents were between 40 to 50 years old and 28% were between 30 to 40 years old. Most respondents (62%) reported that they had 16 or more years work experience, including both inside and outside of Extension. By gender, the respondents were 88.8% male and 12.2% female. Agents were asked to self-rate their overall IT skills on scale from "very poor" to "very strong". Approximately 68% of respondents reported their skills to be "poor" and approximately 17% of respondents reported their skills to be "very poor"(Table 1).

Table 1. Self-rated overall IT skills for all respondents.

| IT skills | <i>f</i> | % | <i>Cum %</i> |
|-------------|----------|------|--------------|
| Very poor | 15 | 16.7 | 16.7 |
| Poor | 61 | 67.8 | 84.5 |
| Average | 11 | 12.2 | 96.7 |
| Strong | 2 | 2.2 | 98.9 |
| Very strong | 1 | 1.1 | 100 |

Objective 2

The second objective was to determine how extension agents are using IT on the job.

• *Average Weekly Computer Use:* As shown in table 2, approximately 89% responded that they use their computer, both at home and at work, between "0-5 hours a week". Approximately 7% reported computer use at between 6-10 hours.

Table 2. Hours of computer use per week for all respondents.

| Level of use | <i>f</i> | % | <i>Cum %</i> |
|--------------------|----------|-----|--------------|
| 0-5 hours a week | 81 | 89 | 89 |
| 6-10 hours a week | 6 | 6.6 | 95.6 |
| 11-15 hours a week | 2 | 2.2 | 97.8 |
| 15+ hours a week | 2 | 2.2 | 100 |

• *Use of Electronic Mail:* Asked if they use e-mail, 31% (n=29) of respondents answered "yes". Agents were asked to give their average weekly use of e-mail. As shown in Table 3, 51.7% of the agents responded, "0-5 minutes a week", 17.2% responded "6-30 minutes a week" and 13.8% of the agents responded, "31-45 minutes a week".

• *Use of the World Wide Web:* Asked if they use WWW, 66.6% of respondents answered "no".

Table 3. Agents average weekly use of e-mail.

| Level of use | <i>f</i> | % | <i>Cum %</i> |
|------------------------|----------|------|--------------|
| 0-5 minutes a week | 15 | 51.7 | 51.7 |
| 6-30 minutes a week | 5 | 17.2 | 68.9 |
| 31-45 minutes a week | 4 | 13.8 | 82.7 |
| 45-60 minutes a week | 2 | 6.9 | 89.6 |
| Over 60 minutes a week | 3 | 10.4 | 100 |

• *Assessing specific software skills:*

The study endeavored to generate an objective assessment of agents' computer skills by asking if they could perform specific task. Asked questions about specific software skills such as: E-mail, Word processing, Presentation software, WWW, and Web page editing". As shown in Table 4, approximately 53% of agents had very poor specific software skills and 2% of agents had very strong.

Table 4. Specific software skills.

| Specific software skills | very poor | | poor | | average | | strong | | very strong | |
|--------------------------|-----------|-------|----------|-------|----------|-------|----------|------|-------------|------|
| | <i>f</i> | % | <i>f</i> | % | <i>f</i> | % | <i>f</i> | % | <i>f</i> | % |
| E-mail | 50 | 52.63 | 29 | 30.52 | 10 | 10.52 | 4 | 4.21 | 2 | 2.10 |
| Word processing | 48 | 51.06 | 30 | 31.91 | 8 | 8.51 | 5 | 5.31 | 3 | 3.19 |
| Presentation software | 59 | 63.44 | 28 | 30.10 | 4 | 4.30 | 1 | 1.07 | 1 | 1.07 |
| WWW | 45 | 47.87 | 31 | 32.97 | 11 | 11.70 | 3 | 3.19 | 4 | 4.25 |
| Web page editing | 69 | 74.19 | 21 | 22.58 | 2 | 2.15 | 1 | 1.07 | 0 | 0 |

Objective 3

The third objective was to determine future IT training needs for extension agents. Six items, which have been investigated in previous studies, were used in the questionnaire for this research. The respondents were asked to indicate their opinion regarding each one of the futures IT training needs. Table 1 provides ranking of these needs. The data presented in Table 5 reveals that the top five IT training needs for extension agents were: E-mail, Presentation software, Word processing, Spss, WWW.

Table 5. IT training needs for extension agents.

| Rank | SD | Mean | N | Item |
|------|------|------|----|--------|
| 1 | 1.02 | 4.15 | 95 | E-mail |

| | | | | |
|--|------|------|----|-----------------------|
| 2 | .98 | 4.06 | 94 | Presentation software |
| 3 | .86 | 3.85 | 96 | Word processing |
| 4 | 1.06 | 3.67 | 95 | Spss |
| 5 | .97 | 3.52 | 93 | WWW |
| 6 | 1.04 | 2.02 | 95 | Web page editing |
| Scale: 1) very low need; 2) low need; 3) moderate; 4) high need; 5) very high need | | | | |

Objective 4

The fourth objective was to identify correlation between selected dependent variables with use of IT. The model in Figure 1, , has been developed for the purposes of the study described in this paper. The model is based upon the work of Thong & Yap (1995), Johnson & Scholes (1993), Fry & Stone (1995), Hunger & Wheelen (1996), and Colthard, Howell & Clarke (1996).

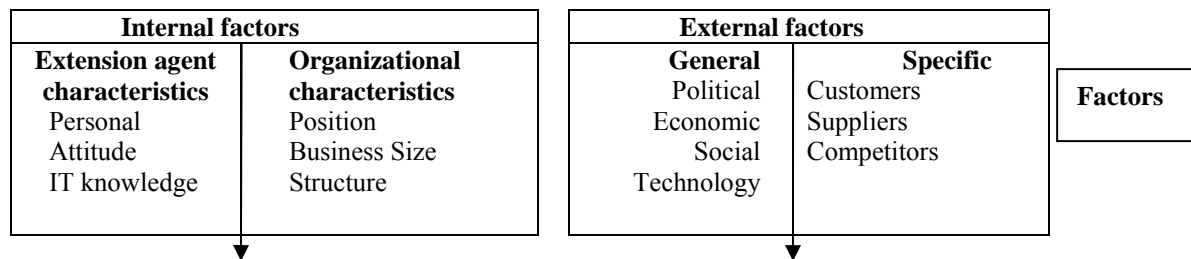


Figure 1. Conceptual research model of factors affecting the use of information technology

In this study, there was a significant relationship between the age, IT knowledge, position, income, social participation, attitude regarding using IT and level of education with use of information technology by extension agents (Table 6).

Table 6. Correlation between selected variables with using of information technology by extension agents.

| <i>Variable</i> | r | p |
|-----------------------------|--------|----------|
| Level of education | 0.645 | 0.000*** |
| Social participation | 0.213 | 0.003** |
| Income | 0.466 | 0.000*** |
| Age | -0.572 | 0.000*** |
| IT knowledge | 0.512 | 0.000*** |
| Business Size | 0.009 | 0.123 |
| Position | 0.433 | 0.000*** |
| Attitude regarding using IT | 0.251 | 0.002** |

Note. *: p<0.05; **: p<0.01; ***: p<0.001

Liner regression used for predict changes in using of information technology by extension agents. Level of education, social participation, income, IT knowledge, position and attitude regarding using IT may well explain for 78% changes ($R^2=.78$) in using of information technology by extension agents. This relationship is described in the following formula:

$$+0.654x_5 + 0.567x_6 + 0.369x_4 + 0.258x_3 + 0.326x_2 + 0.432x_1 + 5.541 = Y$$

Table 7. Liner regression for predict changes in use of information technology by extension agents.

| Tsig | T | Beta | SE B | B | Variable |
|----------------------|-------|-------|-------|-------|---|
| 0.000 | 3.369 | 0.345 | 0.325 | 0.432 | Level of education (x ₁) |
| 0.000 | 2.639 | 0.296 | 0.366 | 0.326 | Social participation (x ₂) |
| 0.000 | 3.624 | 0.368 | 0.269 | 0.258 | Income (x ₃) |
| 0.000 | 4.332 | 1.123 | 0.726 | 0.369 | IT knowledge (x ₄) |
| 0.000 | 3.254 | 0.495 | 0.369 | 0.654 | Position (x ₅) |
| 0.000 | 3.291 | 0.852 | 0.658 | 0.567 | Attitude regarding using IT (x ₆) |
| 0.000 | 4.235 | - | 1.302 | 5.541 | Constant |
| 0.000 =Sig F | | | | | 13.126 F= |
| 0.78 =R ² | | | | | 0.883= R |

Recommendations and Implications

In the context of developing countries, IT is seen as one of the most significant forces of modernization. In the global 'information society' the various indicators of diffusion of IT are a characteristic of development (Avgerou, 2000). The use of information technology in agriculture has grown rapidly in the past few years. It is increasingly being used to help managers make better decisions. However, information technology and the problem facing decision makers are constantly changing. Thus, future information systems for research purposes will be significantly different than current systems because of these changes. Information technology has been one of the most aspired fields in today's world. Integrating IT with agriculture will help any country to regulate its overall economy and trade. Information technologies (ITs) offer the ability to increase the amount of information provided to all participants in the agricultural sector and to decrease the cost of disseminating the information. IT supports new methods for precision agriculture like computerized farm machinery that applies fertilizers and pesticides using satellite positioning. Farm animals are fed and monitored by electronic sensors and identification systems. There is an urgent need for research in the proper use of such new technologies in agriculture. Good models, efficient algorithms and user-friendly software are especially sought for. Knowledge produced by the agricultural scientist must be transformed into computer understandable representations. Electronic communication in the agricultural society and rural areas must be developed.

The findings do provide some interesting implications and suggest some recommendations for training and professional development programs to enhance program effectiveness of extension agent. E-mail, Presentation software, and Word processing ranked highest in training needs for extension agents. A focus on targeted training needs can also serve to enhance program effectiveness, by upgrading agents' skills in software they use frequently to deliver programs.

From a training and professional development standpoint, a key implication of this study is that agents have a desire to learn about the staples of their everyday IT experience: E-mail, presentation software, word processing, SPSS software, and WWW. The findings related to knowledge about IT suggested that such training needs to be done at the basics level.

Agricultural universities must prepare not only students to use new IT, but must also help farmers in better use of the web by different means, e.g., extension services, and creating new

specific web sites. The information system of the future will need to concentrate more on the upper levels knowledge and wisdom. The information system of the future must have both forms of knowledge, and encourage the conversion of knowledge between the forms as a continuous process. Only by this process will the manager's knowledge base grow in size and function.

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