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Improvement Mechanisms of Management Information System (MIS) In Iran's Agricultural Extension Organization

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Abstract: This research describes the MIS improvement mechanisms in Iran's Agricultural Extension Organization. A survey study was applied as a methodology of research work. Data were collected using a structured questionnaire that addressed to evaluating managers' responses regarding to MIS improvement mechanisms. All mechanisms had mean score greater than 5 as perceived by managers which implied that most mechanisms are moderately important in the present time. According to factor analysis the Improvement mechanisms were categorized into 3 groups consisting: the internal effectiveness, business relationship and technology infrastructure that those factors explained 69.47% of the total variance of the research variables.

Key words: Management information system, information management, agricultural extension organization, Iran

INTRODUCTION

One of the most important functions in any agricultural extension organization is that of information management. The proper management of information sets a foundation for delivery of efficient and effective Extension services by providing accurate information to those who need it, when they need it. Information is a primary and essential tool of management. It is the common thread that ties together the cycle of management: planning, execution and control.

Information consists of data that have been processed and are meaningful to a user. A system is a set of components that operate together to achieve a common purpose. Thus a management information system collects, transmits, processes and stores data on an organization's resources, programmes and accomplishments. The system makes possible the conversion of these data into management information for use by decision makers within the organization. A management information system, therefore, produces information that supports the management functions of an organization[7,17,18].

In agricultural extension organization, Management Information Systems is an essential tool for Information management. Extension management information system (EMIS) can be used successfully to facilitate access to a wide range of integrated data sets. They are consistent, modular and flexible tools for the systematic acquisition, analysis and archiving of data and information from a variety of sources. When socio-economic data are also included, MIS can become even more powerful tools for planning and decision-making for agricultural and rural development in agricultural extension organizations[20,10].

However, Quality control, standardization and regular updating are key issues to ensure the usefulness of MIS. The importance of maintaining improvement mechanisms to the development, use and review of MIS systems within the organization must be an ongoing concern of any organization management. MIS should have a clearly defined framework of guidelines, policies or practices, standards and procedures for the organization. These should be followed throughout the organization in the development, maintenance and use of all MIS.

MIS is viewed and used at many levels by management. It should be supportive of the organization's longer term strategic goals and objectives. Effective MIS should ensure the appropriate presentation formats and time frames required by operations and senior management is met. MIS can be maintained and developed by either manual or automated systems or a combination of both. The effective deliveries of an institution's products and services are supported by the MIS. These systems should be accessible and useable at all appropriate

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levels of the organization[5,8,9,13,26,25,4,27,16,6,11,3,14]. However, important issues are subject to change over the time, due to external factors such as rapid IT innovations and their implications in social and Business organizations (such as agricultural extension organization), globalization, and changes in the economic, clienteles and legal systems. To cope with the MIS issues, it is necessary to update the improvement mechanisms and, in the meantime, to keep researchers, practitioners and educators informed periodically. Studies of improvement mechanisms in MIS have gained increased importance for extension managers to reduce of internal and external pressures on extension organization that major reason of pressures is shortage of information among agricultural extension organization.

The present study is the first study in EMIS improvement mechanisms in Iran, has been planned based on the following goals:

- Evaluation of EMIS improvement mechanisms in Agricultural Extension Organization in Iran.
- Identification of determinants of EMIS improvement mechanisms in Agricultural Extension Organization in Iran.

MATERIALS AND METHODS

A survey study was applied as a methodology of research work. Data were collected using a structured questionnaire that addressed managers' responses to the questions. The statistical population of the study consisted of 1500 top managers of agricultural extension Organization in Iran. The sample size was determined by using Cochran's formula. However, the sample included 132 top managers with at least 3 years of experience in managerial activities in agricultural extension. Earlier, a pilot study was conducted in Tehran, Yazd and Fars provinces using 30 managers. The aim was to test and improve the questionnaire; Revisions were made based on the pilot study. Responses from the pilot test were not included in the final sample. The questionnaire included two parts consisting: first 30 MIS improvement mechanisms to be ranked and second questions about the individual and organizational factors (level of education of managers, managerial IT knowledge and structure of IS Department, goal alignment, management style, resources allocation and top management support).

The initial list of MIS improvement mechanisms was synthesized from the previous studies[5,8,26,4,16,27,6,11,21,14], Their rationality, format, translation and statements were closely examined by the several experts. Respondents were asked to rate, rather than rank, the importance of the key mechanisms using a 10 point Likert-type scale, ranging from Not Important (1) to Very Important (10). A wider 1-10 scale is employed in the present study due to its popularity in the literature[26,4,276]. Respondents were encouraged to add mechanisms to the list as required. The rating approach allows respondents to assign the same rating to different mechanisms and in the process need not simultaneously consider all the mechanisms that are less mentally taxing, rate each mechanisms independently. Most important, data collected from rating is an interval-based scale which is valuable for the follow-up analyses.

As mentioned above the second part of the questionnaire includes a number of questions[19,12,15,22,1,2,23], Pertinent to organizational factors and individual characteristics.

Research procedure: A package that was mailed to each member of The Managers of Agricultural Extension Organization contains two items: a covering letter explaining the importance of the study, a Four-page questionnaire with stamped return address on the back. The covering letter requested the respondent to return the completed questionnaire within three weeks. The respondents were assured of the confidentiality of their responses. Follow-up phone calls were made to the organizations that had not responded three weeks after sending out the questionnaire.

RESULTES AND DISCUSSIONS

Three parts illustrate findings: descriptions of the organizational factors, important improvement mechanisms in Iran, factor analysis of improvement mechanisms.

Organizational factors: As shown in Table1, most of the (92.4%s) managers of Agricultural Extension Organization participated in study, were men and there were merely 10 female managers. Considering the educational level, most of the Managers had M.Sc. Degree (87%s). The categorization of managerial IT Knowledge showed that, most of the managers settled in partly low category with 49 persons (37.1%).

IS structure and management style: As shown in Table1, the majority of organizations had a centralized cooperative computing environment. As for management style most of the managers had a coaching management style for leadership of the IS department.

Table 1: Participating organizations and respondents profiles

	f	%		f	%
IS structure			Top management Support		
Centralized	10	7.6	Favorable	13	9.8
Decentralized	18	13.6	Partly Favorable	54	40.9
Centralized cooperative	65	49.2	Partly Un Favorable	47	35.6
Distributed cooperative	39	29.5	Un Favorable	18	13.6
Respondents education			Goal Alignment		
Diploma Degree	6	4.5	High	14	10.6
B.Sc. Degree	23	17.4	Medium	87	65.9
M.Sc Degree	87	65.9	Low	31	23.5
Ph.D. Degree	16	12.1	Management Style		
Gender			Directing	11	8.3
Male	122	92.4	Supporting	46	34.8
Female	10	7.6	Coaching	57	43.2
Managerial IT knowledge			Delegating	18	13.6
Low	38	28.8	Resource Allocation		
Partly Low	49	37.1	High	54	40.9
Partly High	33	25.0	Medium	66	50.0
High	12	9.1	Low	12	9.1

Table 2: Thirty improvement mechanisms studied

Improving mechanisms	Mean	Std.
Improving the effectiveness of software development	6.84	1.94
Satisfying users' needs	6.72	2.00
Managing MIS human resources	6.62	1.72
Building a responsive IT infrastructure	6.62	1.74
Appropriate resources allocation for MIS development program	6.61	1.90
Using object-oriented programming	6.60	2.00
Facilitating design and implementation of MIS	6.56	1.90
Recruiting and developing IS human resources	6.54	1.84
Educating agency managers about MIS capability	6.50	1.98
Measuring MIS effectiveness and productivity	6.48	1.78
Improving MIS technical infrastructure	6.44	1.96
Improving MIS strategic planning	6.42	1.78
Providing leadership committee for MIS development program	6.41	1.84
Providing better systems interface standards for applications integration	6.36	1.82
Developing and managing distributed systems	6.34	1.94
Providing top management support for MIS development program	6.33	1.74
Planning and managing communication networks	6.33	1.92
Developing a better promotion channel for MIS professionals	6.32	1.84
Application of appropriate method and practice in implementation of MIS	6.31	1.88
Using management information system for competitive advantages	6.30	1.80
Developing effective communications with end users	6.28	1.80
Providing of specialists personnel for Development program of MIS	6.22	1.64
Reducing complexity of MIS software	6.22	1.74
Facilitating organizational learning	6.16	1.78
Developing and implementing an information architecture	6.14	1.80
Developing effective communications with senior manager	6.12	1.76
Making effective use of the data resource	6.10	1.58
Increasing understanding of MIS role and contribution	6.00	1.74
Training agency personnel in use of MIS technology	5.96	1.80
Reducing cost of establish, implementation and keeping of MIS	5.66	1.54

Top management support, goal alignment, resource allocation: Top management support among studied organizations was partly favorable. Considering the goal alignment level of MIS with organizations, most of the organizations had medium level of alignment. Studied organizations had medium level of resource allocation for MIS development programs.

Improvement mechanisms discussion: Thirty improvement mechanisms are listed, according to their importance, in Table 2. The mechanism of Improving the effectiveness of software development had the highest mean score (6.84). This implies that most of the managers agreed that this mechanism was most critical among the mechanisms; all mechanisms had mean score greater than 5 which implied that the respondents

Table 3: The extracted determinants along with the Eigen values, variance percentage and the cumulative variance percentage

The factor No.	Eigen values	the variance percentage of the Eigen values	cumulative variance percentage
1	9.39	31.33	31.33
2	6.21	20.66	51.99
3	5.25	17.43	69.47

Table 4: The factors deterring the MIS improvement mechanisms and the variables of each factor

Factors	Improvement Mechanisms	Factor Loads
Internal Effectiveness	Improving the effectiveness of software development	0.8309
	Application of appropriate method and practice in implementation of MIS	0.7917
	Developing a better promotion channel for MIS professionals	0.7596
	Reducing cost of establish, implementation and keeping of MIS	0.7548
	Appropriate resources allocation for MIS development program	0.7223
	Measuring MIS effectiveness and productivity	0.7187
	Facilitating design and implementation of MIS	0.6651
	Educating agency managers about MIS capability	0.5957
	Providing of top management support for MIS development program	0.5890
	Recruiting and developing IS human resources	0.5865
	Providing better systems interface standards for applications integration	0.5827
	Training agency personnel in use of MIS technology	0.5636
	Managing MIS human resources	0.5401
	Providing of leadership committee for MIS development program	0.5095
Business Relationship	Facilitating organizational learning	0.7699
	Improving MIS strategic planning	0.7070
	Increasing understanding of MIS role and contribution	0.7051
	Satisfying users' needs	0.6965
	Using management information system for competitive advantages	0.6784
	Developing effective communications with senior manager	0.6689
	Developing effective communications with end users	0.6688
	Making effective use of the data resource	0.6087
Technology Infrastructure	Using object-oriented programming	0.7913
	Developing and implementing an information architecture	0.7581
	Reducing complexity of MIS software	0.7249
	Planning and managing communication networks	0.6491
	Improving MIS technical infrastructure	0.6071
	Building a responsive IT infrastructure	0.6022
	Providing of specialists personnel for Development program of MIS	0.5955
	Developing and managing distributed systems	0.5819

Perceived most mechanisms moderately important in the present time. The mean differences between the most and the least important mechanisms were 1.18.

Factor analysis: The factor analysis was utilized to summarize the variables of the research to a smaller quantity and to determine the effect of each one of the factors to confine the MIS improvement mechanisms. The implemented computations revealed that the internal coherence of the data is appropriate (KMO = 0.902) and Bartlett's statistical data was at 0.01 level significant. According to Kaiser Criteria there were 3 factors that their Eigen values were extracted more than 1 (Table 3). The research variables were categorized into 3 factors by using Varimax Rotation Method (Table 3).

The variables of each factor were extracted based on the Table4 and describe as follows:

According to factor analysis the improvement mechanisms were categorized into 3 groups, the first one was called the Internal Effectiveness factor. This factor had the most Eigen value (9.39) among the other factors. Also this factor explained 31.33% of the total variances of the variables.

The second factor was called the Business Relationship. This factor that its Eigen value was 6.21 explained 20.66% of the total variances of the variables.

The third factor was called the Technology Infrastructure. This factor that its Eigen value was 5.25 explained 17.43% of the total variances of the variables.

As shown in Table 3, the 3 above factors explained 69.47% of the total variance of the research variables. In other words it wasn't explained 30.53 of total variance that pertains to other variables and these portending has not come true in this analysis.

CONCLUSIONS

This research studied of Iran's EMIS Improvement mechanisms. Several conclusions drawn from the present study are:

- Factors were extracted from the MIS improvement mechanisms including the first factor were called Internal Effectiveness and explained 31.33% of the total variance and were considered as the most effective factor. It is recommended that Managers be considered programming for improvement and development of Internal Effectiveness organizations' MIS.
- The IS studies in the 1980, 1990s showed that technological Improvement mechanisms were of less concern than managerial improvement mechanisms. These studies also indicated that this trend would continue, especially when the organizations became more internationally involved. However, recent improvement mechanisms studies have indicated that this trend did not continue (V.S. Lai, 2001), But present study showed that technological improvement mechanisms as well as managerial improvement mechanisms is important, although numbers of managerial improvement mechanisms among 10 top improvement mechanisms (6 mechanisms) in present study was higher than those of the technological mechanisms).
- According to managers' rating, importance of internal MIS mechanisms was higher than external MIS improvement mechanisms.

Future work is to formulate a research model that more precisely describes the relationship between the organization's factors and the EMIS improvement mechanisms across the countries. The organization factors should extend factors covered in the present study to those that are broadly pertinent to the dimensions of the organization's operating environment[8,6].

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