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Attitude of Agricultural Stakeholders on Use of Short Message Service (SMS) in Transfer of Technology

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ABSTRACT

The goal of Information and Communication Technology (ICT) is to provide the benefits of information revolution to the rural masses by enhancing farming efficiency, farm productivity and farmers' income. In order to bring knowledge empowerment of rural people and to increase agricultural productivity, cyber extension centers were established in Sidhauli and Kasmanda blocks of Sitapur district of Uttar Pradesh under "Cyber Extension Model for Agricultural Development: An Action Research project". In order to strengthen the information base of the farmers and to bridge the information gap, SMS was sent to the farmers from project location. In this background, a study was conducted in Sidhauli and Kasmanda block of Sitapur district of Uttar Pradesh among 80 farmers (40 in each block), 20 *Krishi Vigyan Kendra* (KVK) and State Agriculture Department (SAD) officials and 20 post office personnel to find out ease of use, usefulness and attitude towards SMS. The findings revealed that seventy per cent farmers, 100 per cent KVK and 100 per cent post office personnel were having mobile phones. It was also found that 55 per cent of farmers and all post office and KVK personnel strongly agreed with the point that SMS was fast, easy to understand and follow. Action taken results showed that 80 per cent of the farmers and 100 per cent of post office and KVK personnel opened the message up, 80 per cent of the farmers, 100 per cent of post office and KVK personnel read the contents of the message, 60 per cent of the farmers utilized the message and 30 per cent of the farmers and 90 per cent of post office and KVK personnel spread the message among the farmers. The findings had shown that SMS played a substantial role in bridging the agricultural information gap in the rural area.

Key words: Mobile phone, SMS, ease of use, attitude towards SMS

INTRODUCTION

Addressing the information need of the farmers is a major concern especially for the developing countries due to insufficient rural infrastructure, inaccessible terrain, lack of funds and other reasons as well. Many farmers often need the information when they are in the field far away from ad-hoc information sources. Many management decisions in modern farming require up-to-date and local information, for example regarding weather forecasts and regional recordings of crop diseases and pests (Jensen *et al*., 2000). To hasten the communication process, there are many innovative communication channels are available now. The advent of new age Information and Communication Technologies (ICTs), like personal computers, the internet and mobile telephones have provided a much wider choice in collection, storage, processing, transmission and presentation of information in multiple formats to meet the diverse information requirements and skills of people. Especially mobile phones provide a new platform through which rural communities will be able to access government schemes and services, crop related information like weather, soil, water, fertilizers and pesticides that are specific to their plot of land and availability of seeds, local market prices *etc.*, using text, data, and audio browsing techniques. Around the world, penetration of mobile communication devices reaching very high rates India has the world's second-largest mobile phone user base with over 904 million users as of October, 2013 (TRAI, 2013). The high penetration of mobile phones and text messaging combined with the low cost of text messaging make this an interesting medium for information dissemination. Muk (2007) argues that mobile phones increase the accessibility, frequency and speed of communication through which timely mobile ads can be delivered to consumers based on their demographic characteristics and geographic information. Short Message Service (SMS) is widely used to spread information from individual to individual, especially in the developing world to reach out to rural populations that could not previously be contacted. According to Leung (2007), there are some who believe that SMS may develop into a major form of interpersonal mediated communication, replacing many phone uses and SMS messaging will become as big as e-mail. Allan Leck Jensen and Iver Thysen (2003) have stated that simple SMSs are used as a medium for communication between

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suppliers and users of information and decision support. SMS can be used for various types of communication, according to their intended effect on the receiver. These types include the following:

Information. The SMS contains all the relevant information about the topic. The user needs not to do anything further.

Notice. The SMS notifies that some information is available. It cannot contain all the relevant information, but may contain a reference (e.g. url) to further information. The user decides whether or not it is necessary to act.

Alarm. The SMS notifies by its arrival alone that some event has occurred to which the receiver must take action.

Dialogue. A sequence of related SMSs consisting of requests and responds between user and supplier.

The objective of this paper is to study the ease of use, attitude and action taken towards SMS on wheat and mustard cultivation practices by farmers, *Krishi Vigyan Kendra* (KVK) / State Agriculture Department (SAD) personnel and post office personnel.

METHODOLOGY

In order to provide agricultural extension services through Information and Communication Technologies (ICTs), cyber extension centers were established in Sidhauli and Kasmanda blocks of Sitapur district of Uttar Pradesh, India under the project "Cyber Extension Model for Agricultural Development: An Action Research". In addition to cyber extension centres, to strengthen the information base of the farmers and to bridge the information gap among agricultural stakeholders, it was decided to send SMS about the improved cultivation practices of wheat and mustard crops. From the above mentioned two blocks, two villages were selected purposively in Sitapur district of U.P. In selecting the sample for this research, mobile phone ownership and SMS agro advisory were kept in mind. Hence, the sample consisted of eighty farmers, twenty KVK/SAD officials and twenty post office personnel from two villages.

This study adopted an exploratory approach to find out the perception about SMS i.e. ease of use, usefulness and attitude towards SMS. Data was collected by using a structured interview schedule. To measure the variables in this study, the respondents were asked to rate their agreement on five statements related to ease of use of SMS and four statements related to attitude towards SMS. The rating on all statements was based on a 5-point Likert scale, 1932. Likert scale is a tool used in questionnaires in which participants are asked to respond to statements on a scale ranging from "strongly agree" to "strongly disagree". The responses were scored from '5' to '1' for strongly agree to strongly disagree statements.

Operationalization of variables

Samsudin, Nor Azila and Al-Momani (2010: 369) defined ease-of-use as "the degree to which a person believes that using an information system would be free of effort". Perceived ease-of-use is more important for the information gathering task (Gefen and Straub, 2000). Effort is a finite resource that a person may allocate to the various activities for which he or she is responsible (Radner and Rothschild, 1975). Rogers (1995) has mentioned that some innovations are readily understood by most members of a social system because of its less complexity. He also mentioned that less complex innovations will be adopted more rapidly than other innovations.

Attitude is defined as a predisposition or a tendency to respond positively or negatively towards a certain idea, object, person, or situation, and it influences an individual's choice of action, and response to challenges, incentives, and rewards.

Data analysis

Descriptive statistics were the main tool used to explore the questionnaire data, summarize and describe observations. In this research, descriptive statistics in the form of frequency and percentage were used to obtain summary statistics of respondents including mobile phones ownership, ease of use, usefulness, attitude towards receiving SMS and action taken after receiving SMS.

H_1: Ease of use factor, which includes easy access, and simple language and positive attitude towards SMS has greatly influenced the farmers in using mobile phones and SMS for accessing information.

RESULTS AND DISCUSSION

Initially, a preliminary survey was conducted to find out how many farmers were having mobile phones. For that, from two villages, 80 farmers were selected randomly.

Table 1: Mobile phones ownership by farmers, KVK/SAD and Post office personnel

n=120

Affordability (to buy mobile phones and send SMS related problems)	Farmers (n=80)		KVK/SAD officials (n=20)		Post office personnel (n=20)	
	f	%	*f*	%	*f*	%
Yes	55	68.75	20	100.00	20	100.00
No	25	31.25	0	0.00	0	0.00
Total	**55**	**100.00**	**20**	**100.00**	**20**	**100.00**

From the table 1, it was found that out of 80 farmers, 55 farmers (68.75%) had possession of mobile phones whereas 25 (31.25%) of them did not have it. The full details of SMS based agro-advisory is given in Table 2.

Table 2: Information on SMS based Agro-advisory

Crops	Wheat and Mustard
Content	❑ Land preparation ❑ Seed treatment and sowing ❑ Fertiliser application (top dressing) ❑ Irrigation ❑ Weeding ❑ Crop protection ❑ Harvesting
Recipients	❑ Farmers (55) ❑ Extension personnel (20) ❑ Post Office Staff (20)

After receiving SMS, data was collected to know the perception of the farmers about SMS. Our analysis revealed that three main factors determine the use of SMS as an information source: ease of use, usefulness and attitude towards receiving SMS.

The following table 3 shows the perception of the farmers, SAD and KVK personnel regarding SMS. Generally, the result was under high frequency.

Table 3: Ease of use, usefulness and attitude of farmers towards receiving SMS

n=55

Category of respondents	Farmers									
	SA		A		N		DA		SAD	
	f	%	*f*	%	*f*	%	*f*	%	*f*	%
Ease of use										
SMS is easy to use	1	2.0	25	45.0	2	4.0	19	35.0	6	10.0
Can access SMS at anytime and from anywhere	3	5.0	6	10.0	3	5.0	39	70.0	6	10.0
The design of mobile phone improves access to SMS	5	9.0	25	46.0	4	8.0	15	27.0	6	10.0
SMS is fast, easy to understand and follow	4	8.0	34	62.0	3	5.0	8	15.0	6	10.0
The language is not complicated	8	15.0	39	70.0	6	10.0	3	5.0	0	0.0
Attitude of the farmers who think										
SMS is a good idea	0	0.00	8	15.00	0	0.0	44	80.0	3	5.0
Receiving SMS is an wastage of time	3	5.00	45	82.00	3	5.0	4	8.0	0	0.0
Respond to the SMS after receiving it	0	0.00	0	0	0	0.0	55	100.0	0	0.0
Receiving SMS is an interruption during daily activities	8	15.0	30	55.0	6	10.0	8	15.0	3	5.0

SA=Strongly Agree; A= Agree; N= Neutral; DA= Disagree; SDA= Strongly Disagree

In the five-point continuum of scale, most of the farmers were in the positive side. They perceived that SMS is easy to use (47.00 %), design of mobile phone improve access to SMS (54.00%), SMS is fast & easy to understand (70.00%), and language is not complicated (85.00%). Rogers (1995) has mentioned that it does not matter so much if an innovation has a great deal of objective advantage. What does matter is whether an individual perceives the innovation as advantageous. This was well evidenced in the study that farmers perceived mobile phone is an innovative and useful tool. More than 70 per cent of the farmers were having positive attitude that SMS is not wastage of time and not an interruption during daily activity. Rittippant *et al*. (2009) had given in their findings of the study that of the 300 respondents, 80 per cent agree that the ease of use factor, which includes easy access, convenience and fun elements has greatly influenced mobile users in using SMS for voting.

Table 4: Ease of use, usefulness and attitude of KVK/SAD personnel towards receiving SMS

n=20

Category of respondents	KVK/SAD officials									
	SA		A		N		DA		SAD	
	f	%	*f*	%	*f*	%	*f*	%	*f*	%
Ease of use										
SMS is easy to use	12	60.0	4	20.0	0	0.0	3	15.0	1	5.0
Can access SMS at anytime and from anywhere	3	15.0	16	80.0	0	0.0	1	5.0	0	0.0
The design of mobile phone improves access to SMS	3	15.0	13	65.0	1	5.0	2	10.0	1	4.0
SMS is fast, easy to understand and follow	6	30.0	14	70.0	0	0.0	0	0.0	0	0.0
The language is not complicated	8	40.0	12	60.0	0	0.0	0	0.0	0	0.0
Attitude of the farmers who think										
SMS is a good idea	2	10.0	16	80.0	0	0.0	2	10.0	0	0.0
Receiving SMS is an wastage of time	0	0.00	2	10.0	2	8.0	6	30.0	10	50.0
Respond to the SMS after receiving it	0	0.00	0	0.00	0	0.0	16	80.0	4	20.0
Receiving SMS is an interruption during daily activities	0	0.00	0	0.00	3	15.0	14	70.0	3	15.0

From the table 4, it was found that 80 per cent of KVK personnel had agreed that SMS is easy to use followed by accessing SMS at anytime and from anywhere (95.00%), design of mobile phone improves access to SMS (80.00%), and language is not complicated (100.00%). Most of the KVK personnel (90.00%) had positive attitude in receiving SMS (80.00%), respond to SMS followed by receiving SMS (80.00%). This in line with the findings of Sin *et al.,* (2008). They reported that there is no need to explain the voting process in detail as almost 80 per cent of the mobile users know how to use the SMS service.

Table 5: Ease of use, usefulness and attitude of post office personnel towards receiving SMS

n=20

Category of respondents	KVK/SAD official									
	SA		A		N		DA		SAD	
	f	%	*f*	%	*f*	%	*f*	%	*f*	%
Ease of use										
SMS is easy to use	12	60.0	4	20.0	1	4.0	2	10.0	1	6.0
SMS can be accessed at anytime and from anywhere	5	25.0	11	55.0	0	0.0	3	15.0	1	5.0
The design of mobile phone improves access to SMS	3	15.0	10	50.0	2	10.0	3	15.0	2	10.0
SMS is fast, easy to understand and follow	9	45.0	11	55.0	0	0.0	0	0.0	0	0.0
The language is not complicated	11	55.0	9	45.0	0	0.0	0	0.0	0	0.0
Attitude of the farmers who think										
SMS is a good idea	1	5.0	15	75.0	1	5.0	3	15.0	0	0.0
Receiving SMS is an wastage of time	0	0.0	3	15.0	1	5.0	16	80.0	0	0.0
Respond to the SMS after receiving it	0	0.0	0	0.0	0	0.0	20	100.0	0	0.0
Receiving SMS is an interruption during daily activities	0	0.0	2	10.0	3	15.0	13	65.0	2	10.0

Most of the post office personnel had favourable attitude about SMS. They had the attitude that receiving SMS is not wastage of time (80.00%) and not an interruption (75.00%). Waldt *et al.,* (2009) found in their study that consumers' perceptions of the entertainment value, informativeness and credibility of SMS advertisements were positively correlated to consumers' overall attitude towards SMS advertisements. After asking about their attitude towards SMS, ease of use, usefulness and language *etc*. what the actions were taken by farmers, KVK/SAD personnel and post office personnel were studied and the results are furnished in table 6, 7 and 8.

Table 6: Action taken by farmers after receiving SMS

n=55

Activities undertaken by the farmers	*f*	%
Opening the message up	44	80.00
Read the contents of the message	44	80.00
Utilising the information	33	60.00
Just ignore it	11	20.00
Spreading the message with the fellow farmers	17	30.00
Discussing about the SMS with the fellow farmers	30	55.00

This table shows that 80.00 per cent of the farmers opened the message and read the contents of the message. Out of this 80.00 per cent, only 60.00 per cent utilized the information followed by 55.00% discussed about the SMS with the fellow farmers. Word-of-mouth is another effective conduit for informing a target audience about a new SMS or phone service - though it is also often the most difficult to tap into. Some 50 per cent of low income respondents and 57 percent of those with a primary education said they get news and information from other people in their community (outside their friends and family) at least weekly.

Table 7: Action taken by KVK/SAD personnel after receiving SMS

n=20

Action taken by KVK/SAD personnel	*f*	%
Opening the message up	20	100.00
Read the contents of the message	20	100.00
Utilising the information	0	0.00
Just ignore it	5	25.00
Spreading the message to the farmers	18	90.00
Discussing about the SMS with the farmers	13	68.00

From the table 7, it was found that all the KVK/SAD personnel (100.00 %) opened the message and read the contents of the message. Out of this 100.00 per cent, only 90.00 per cent spread the message followed by 68.00 per cent discussed about the SMS in detail.

Table 8. Action taken by post office personnel after receiving SMS

n=20

Action taken by post office personnel	*f*	%
Opening the message up	20	100.00
Read the contents of the message	20	100.00
Utilising the information	0	0.00
Just ignore it	3	15.00
Spreading the message to farmers	18	90.00
Discussing about the SMS with the farmers	20	100.00

This table shows that all the post office personnel (100.00 %) opened the message and read the contents of the message. Out of this 100.00 per cent, only 90.00 per cent spread the message followed by 68.00% discussed about the SMS in detail.

DISCUSSION

It is not the innovation *per se*, instrument *per se* and technology *per se*, which affects the desirable behaviour. The desirable behaviour is the influence of both extrinsic as well as intrinsic factors. Both extrinsic factors such as, characteristics of an innovation and intrinsic factors such as individual perception and attitude, decide the action from an individual. Festinger (1950) argued that people depend on social reality to determine the subjective validity of their attitudes and opinions, and that they look to their reference group to establish social reality; an opinion or attitude is therefore valid to the extent that it is similar to that of the reference group. This factor may be the reason that majority of the respondents had favourable attitude towards SMS. Mitra (2014) in his study reported that computers are used for several different activities and the level of use is related to attitudes toward computers. He further reported that respondents who reported higher use of computers indicated a more positive attitude toward computers on all the different attitude scales. David (1989) in his study put it in a different way that an application perceived to be easier to use than another is more likely to be accepted by users. Meijer *et al*., (2014) in their study reported that although the intrinsic factors are important, these factors receive relatively little attention due to methodological challenges in measuring them. Even though, the best agriculture practices are available, disseminating it determine the accessibility and utility of such information. ICT is having lot of potential to deliver better farm extension services. Scherr (1992) in his study reported that media-based extension is one of the five basic models for extension available for agricultural practices. Meijer *et al*. (2014) in their study reported that the role of extension and training is crucial in the development of knowledge, perceptions and attitudes about agricultural innovations. The respondents faced following difficulties in receiving SMS; some of the handsets like Sony Ericson, Samsung *etc*. were not supporting hindi language; hence, farmers were not able to read the content of the SMS. The respondents who were having Nokia set did not have any problem in receiving SMS. Farmers were not carrying the mobile phone all the time and then, they were not having a habit to check the messages in inbox often. If the SMS is received at the time when the mobile phones were in the farmers' hand, then they opened the message and read the content. Where access to technology is a problem, using alternative media and or alternative technology such as voice message may bring the possible solution. Apart from this, because of poor electricity supply, farmers faced problems in charging the handset.

CONCLUSION

This study concludes that mobile phone is becoming very popular tool as it bring the world within reach for the general public especially for agricultural scientists, farmers and extension workers in delivering and sharing critical crop information including weather, pest and disease management practices. This is clear from the fact that majority of the respondents had favourable attitude towards SMS. However, there were certain constraints in receiving SMS by the stakeholders. These constraints need to be taken into consideration in mobile based agro-advisory services sent to the farmers and other agricultural stakeholders. This study is helpful from a strategic point of view to know whether farmers access information via SMS or not, what is their attitude about receiving SMS, what are all the constraints involved in it and whether they are utilizing the information and are disseminating to others. The unique characteristics of mobile users, along with the increasing trend for mobile SMS usage, have led to a need for further studies on mobile SMS communications.

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