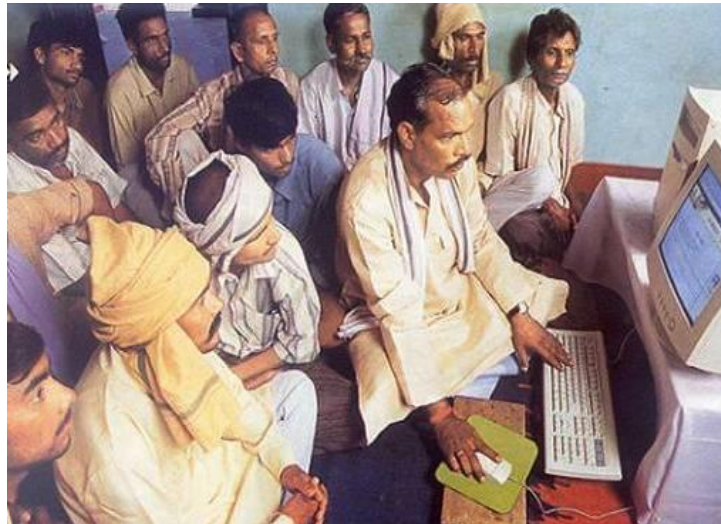


Running Head: Opinion Leadership Networks in Indian Villages

Opinion Leadership Networks and Diffusion of *e-Choupal* in Indian Villages



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Opinion Leadership Networks and Diffusion of *e-Choupal* in Indian Villages

Abstract

The *e-Choupal* system was initially set up by the Indian Tobacco Company (ITC) in 2000, providing farmers with information about latest market prices of crops, a provision to sell crops directly to buyers, and up-to-date information on weather and farming practices through its Internet networks. This article analyzes the role of opinion leadership among the Indian farmers' communication networks and the use of the opinion leaders to diffuse an innovative farming information source, *e-Choupal*. The specific purposes of this study are to identify opinion leaders by using social network analysis and to analyze the attributes of the opinion leaders in the diffusion of *e-Choupal* in Indian villages.

The research site was the State of Madhya Pradesh in India where was the first state where *e-Choupal* centers were set up. In the state, this study selected 14 villages covered by three *e-Choupal* centers and focused on individual farmers' communication networks. Using a sociometric method of social network analysis, 225 Indian farmers' communication networks were analyzed. As a result, this study found four network groups. From the social network analysis to identify opinion leaders among 225 people in the 14 villages, salient opinion leaders were identified in the four network groups.

The identified opinion leaders were Sanchalaks, who were selected and trained by ITC and the owner of the house where the *e-Choupal* system lies. In terms of innovation diffusion, Sanchalaks were both information sources and influentials on the farmers' decision to adopt the innovation.

Opinion Leadership Networks and Diffusion of *e-Choupal* in Indian Villages

Since Everett M. Rogers (1958) investigated the social network patterns of Iowa farmers in his dissertation study, especially their influence on the diffusion and adoption of farming innovations, many scholars have examined communicative phenomena from the social diffusion perspective. The social network approach to diffusion has helped frame strategies to accelerate the spread of new policies and social interventions in a society. This strategic use of diffusion ideas is called *purposive diffusion* (Singhal & Dearing, 2006).

In order to devise a purposive diffusion strategy, the diffusion planners' first task is to analyze the attributes of a social system where the strategies would be implemented. In doing so, it is important to map the communication network of the social system, identifying the key opinion leaders. According to Rogers (2003), opinion leadership is defined as "the degree to which an individual is able informally to influence other individuals' attitudes or overt behavior in a desired way with relative frequency" (p.300). Based on this definition, the opinion leadership strategy for a purposive diffusion can be understood as a communicative method which uses significant others who can influence or help people's decision to adopt new innovations.

This article analyzes the role of opinion leadership among the Indian farmers' communication networks and the use of the opinion leaders to diffuse an innovative farming information source, *e-Choupal*. This study identifies opinion leaders (OLs) by using social network analysis, and analyzes the attributes of the OLs in the diffusion of *e-Choupal* in villages of India's Madhya Pradesh State. This study raises

some important learnings with respect to social network attributes among Indian farmers, grounded in the diffusion of innovation theory.

What is *e-Choupal*?

The *e-Choupal*, Internet-based information system, was established by the Indian Tobacco Company (ITC), beginning in 2000. This system was designed to provide farmers with information about latest market prices of crops, included a provision for farmers to sell crops directly to buyers, and allowed them to access up-to-date information on weather conditions. *Choupal* means a gathering place in Hindi. Indian farmers come together in a choupal, discuss their farming practices, and share information they have. Developing the idea, *e-Choupal* stands for combination of the idea of a gathering place and an electronic market place.

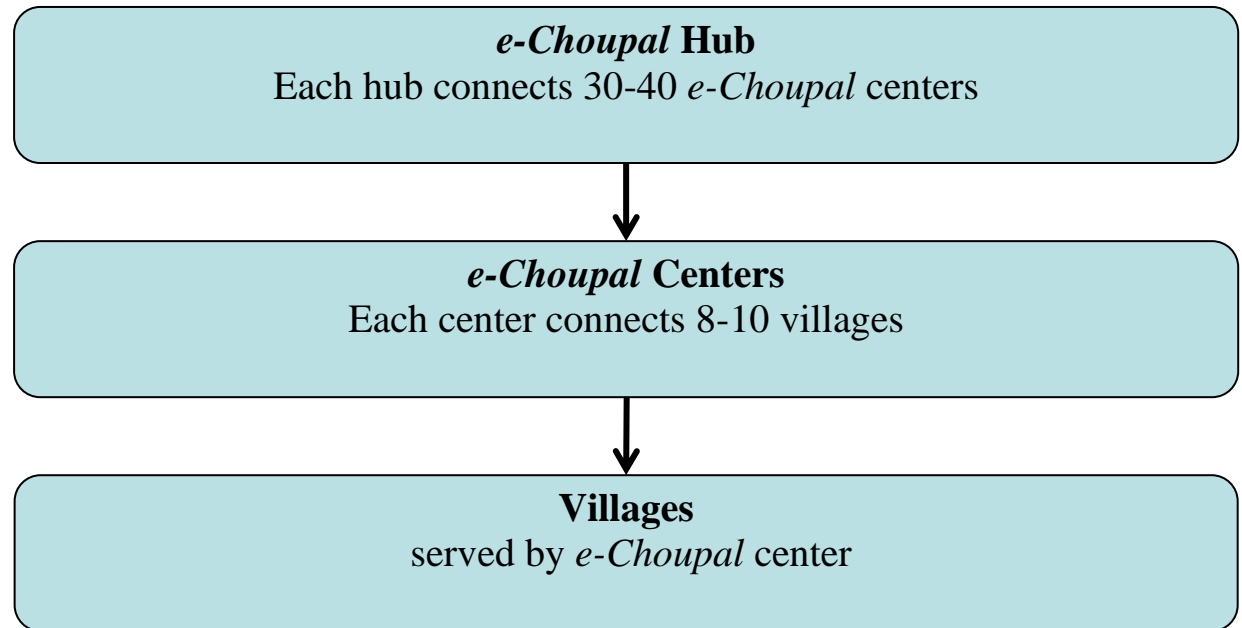
The general purpose of ITC's *e-Choupal* initiative was to reform the agricultural market structure of India which has been trapped by low investment, low productivity, weak market orientation, low value addition, low margin, and low risk taking ability (One Choupal, n.d.). Based on this purpose, ITC employed a market-led business model in order to increase the competitiveness of the Indian agricultural industry and prompt high productivity, high incomes, and substantial risk management for Indian farmers. Through *e-Choupal*, a new method of procuring and distributing agricultural products in the Indian market was established, providing a substitute for the old *Mandi* system.

Mandi (in Hindi) refers to a place where farmers sell their products to wholesalers or agents who trade agricultural goods on behalf of large corporations or other wholesalers (Prahalad, 2005; Saran, 2004). Under the old system, farmers sold their crops to the commission agents who resold the crops to larger companies such as ITC. Commission agents were usually small in number, each procuring crops from a

large number of farmers. As the *Mandi* was dominated and controlled by the agents, small scale farmers were unable to effectively negotiate the selling price of their crops, and the agents gained at both ends – by lowering their purchasing price from farmers and raising their selling price to large companies (Prahalad, 2005). One of the fundamental reasons that led Indian farmers to “suffer” on the hands of the commission agents was that they could not have access to the latest market price for their crops, and had to physically travel to the *Mandi* to sell their products.

Recognizing the structural problem of the Indian agricultural market, ITC decided to buy crops directly from the farmers through the introduction of the *e-Choupal*. The *e-Choupal* consists of a computer with multimedia features connected to the Internet by dial-up or via VSAT connection (World Bank, 2003). The *e-Choupal* center is installed in the house of a *Sanchalak* who is trained to use the *e-Choupal* information portal, provide information on prices and other services, such as weather information, crop insurance policies, and the like (Bhagat, 2004; Choupal Sagar, 2004; Saran, 2004). Each *e-Choupal* center covers a cluster of four to six neighboring villages. Between 2000 and 2004, 1800 *e-Choupal* centers were set up in Madhya Pradesh (the sentinel research state), with 42 hubs, covering over 8000 villages. By 2007, some 6,500 *e-Choupal* centers were set up in 38,000 villages covering nine Indian states and reaching some four million farmers (One Choupal, n.d.). By 2012, ITC plans to expand *e-Choupal* to 100,000 villages in 15 states, reaching 10 million farmers. The organizational set-up of the *e-Choupal* network at the system level is shown in Figure 1.

Figure 1. Organizational set-up of the *e-Choupal* network



Identification of opinion leaders and social network analysis

Communication and opinion leadership

Opinion leaders are those who are “able to influence other individuals’ attitudes or behaviors of others in the desired direction. (Rogers, 2003). One of the most distinctive and effective features of opinion leadership is that it is based on *informal* and *interpersonal communication*. In a classic diffusion study which became a foundation of further studies, Van Den Ban (1964) highlighted the importance of informal and interpersonal communication in the diffusion process through his research on diffusion of new farming methods among Dutch farmers.

Before Van Den Ban published his research results in 1964, the two-step flow of communication hypothesis introduced by Paul Lazarsfeld, Bernard Berelson, and Hazel Gaudet in *The People's Choice* (1948) had been recognized as the conventional

wisdom in opinion leadership studies. The two-step flow theory posits “ideas often flow from radio and print to the opinion leaders and from them to the less active sections of the population” (p.151). However, Van Den Ban’s study on the diffusion of new farming method showed that farmers’ decision making during the adoption process was determined more by the personal contacts with opinion leaders, even though mass media functioned as a source of new knowledge. In his research, Van Den Ban concluded (pp. 248-249):

1. The adoption of a new idea usually takes quite a long time, certainly in the case of methods which imply many changes in related spheres.
2. Mass media are major agent in arousing the interest in new methods early in the adoption process, but during a later stage personal contacts are especially influential in the decision to adopt a new method. Basically, this process is the same for opinion leaders and for their followers.
3. The first persons to adopt a new idea make intensive use of all sources which can provide reliable information about the idea including mess media as well as personal contacts with qualified informants.
4. Often these innovators and early adopters are also the opinion leaders of their groups, but the relationship between pioneering and opinion leadership is much closer in progressive than in traditional groups.
5. Problems, about which more information is badly needed. Will often make people turn for advice to the best informed people in the community. These are usually people of a high social status.
6. On most new ideas, however, people will not feel an urgent need for information. In this case, people will get their information personally through casual conversations, mainly with people of about the same social status.

Based on these results, it can be argued that opinion leaders more substantially affect lay peoples' final decision making to bring about behavioral change, while mass media provide new information and affect peoples' perceptual change. Hence, an opinion leadership diffusion strategy serves as a more effective strategy for policy or program diffusion that purposes a substantial and voluntary behavioral change.

To use opinion leaders to speed innovation diffusion, the first task is the identification of opinion leaders: who are the opinion leaders in a social system? How are opinion leaders distinguished from those they influence? From the early study of opinion leadership, Katz (1957) explained that opinion leaders could be distinguished from others in terms of three criteria: (1) "who one is" – that is, the personification of certain values, (2) "what one knows" – that is, their competence, and (3) "whom one knows" – that is, their strategic social location. More specifically, through decades of studies, Rogers (2003) identified seven generalizable characteristics of opinion leaders (pp. 316-318).

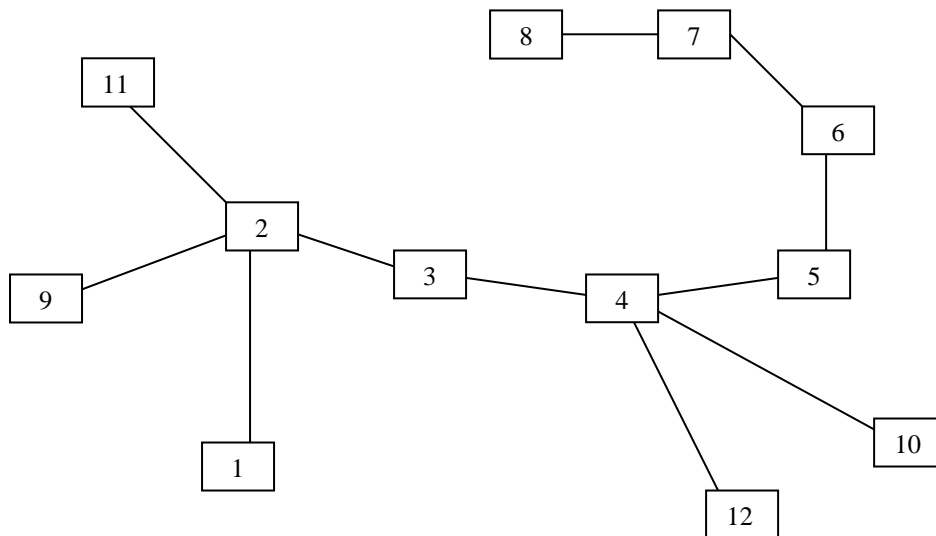
1. Opinion leaders have greater exposure to mass media than their followers.
2. Opinion leaders are more cosmopolite than their followers.
3. Opinion leaders have greater contact with change agents than their followers.
4. Opinion leaders have greater social participation than their followers.
5. Opinion leaders have higher socioeconomic status than their followers.
6. Opinion leaders are more innovative than their followers.
7. When a social system's norms favor change, opinion leaders are more innovative, but when the system's norms do not favor change, opinion leaders are not especially innovative.

Social network analysis and identification of opinion leaders

In order to identify opinion leaders by using social network analysis, the most important and frequently used concept is network centrality. Network centrality measures structural importance of actors (Borgatti, 2006) and indicates which actors can be regarded as those who are in the center of networks. Network centrality has been mainly calculated by using three measures which are degree, betweenness, and closeness: (1) *degree* – measures how many direct connections an individual (node) has; (2) *betweenness* – measures how much an individual controls communication flows between/among other individuals or different communication networks; and (3) *closeness* – measures how quickly an individual can access all other individuals via a minimum of steps.

In opinion leadership studies, individuals who have higher degrees in one of these measures are conventionally regarded as those who would be opinion leaders. In terms of directly reaching as many people as possible, degree centrality is the optimal measure that researchers can check. In this regard, node 2 and 4 in Figure 2 would be opinion leaders. However, according to Borgatti (2006), if one aims at reaching the most people in up to certain steps, closeness centrality could provide better information to accelerate the diffusion of innovations. He explains this with a social network map. In Figure 2, *if one is interested in reaching the most nodes along paths of length 2 or less, node 3 would be a better choice since it can reach 8 nodes in addition to itself while node 4 can only reach 6 nodes* (p.24).

Figure 2. Social Network Map: Closeness Centrality

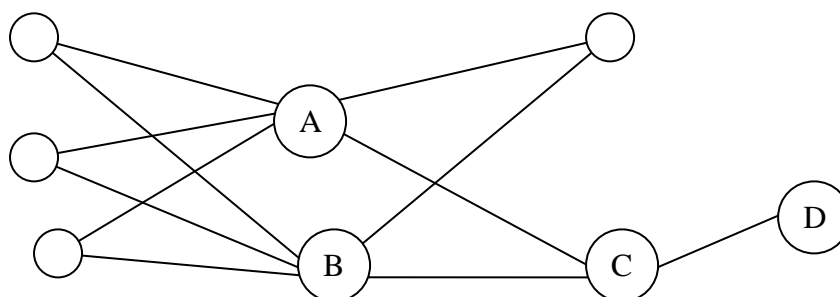


Source: Borgatti (2006)

In addition, Borgatti (2006) raises the issue of structural equivalence.

Structural equivalent refers to the extent to which two nodes have a common set of linkages to other nodes in a network, illustrated by node A and B in Figure 3. In this case, if one can choose more than one individual to diffuse an innovation in the network, the optimal choice is not the set of A and B that have the highest closeness centrality, but A and C. The reason is because of D. Both A and B can reach all node directly except D. However, in order to reach D, Both A and B need two steps going through C, while C can directly reach D. Therefore, if one can choose more than one key player in the network to reach everyone, {A, C} or {B, C} is better than {A, B}.

Figure 3. Social Network Map: Structural Equivalence



Source: Borgatti (2006)

In summary, three centrality measures – including degrees, betweenness, and closeness – can be used for the purpose of identifying opinion leaders. Related to the strategic use of these three measures, as Borgatti (2006) argues, opinion leaders who are the key players in accelerating diffusion would be not just those who have higher centrality measures, but also individuals who are strategically positioned to reach everyone in given research situations (or conditions).

Methods

Background of the Study

This present study is part of a large research project on the diffusion of *e-Choupal* in Indian villages. The research site was the State of Madhya Pradesh in India. This state was the first state where *e-Choupal* centers were set up (ITC, 2003). In the state, 14 villages covered by three *e-Choupal* centers were selected as shown in Table 1. This study focused on individual farmers providing 225 survey data in the 14 villages. We surveyed only male farmers they tend to be the key decision makers in the household, especially with respect to farming issues.

Table 1) Description of the sample from fourteen villages

<i>e-Choupal</i> Center	Year set-up	Village	Sample size
Mograram	2000	Mograram	28
		Amajhar	16
		Aladakhedi	17
		Sat Pipiliya	13
Barkhedanathu	2000	Barkhedanathu	24
		Barkhedikala	10
		Neelbad	10
		Bhilkheda	15
		Bishankhedi	16
Thumuda	2001	Thumuda	15
		Ratanpur	15
		Patania	16
		Jamunia	15
		Dodi	15
Total		N=14	N=225

Identifying opinion leaders: Opinion leadership measurement

The present study employed a socio-metric method of social network analysis. Conventionally, opinion leadership instruments are very simple. Coupled with demographic questions, the survey asked participants to provide one or several names of people whom they talk with or whom they get advice from. Our survey question for identifying opinion leaders was designed on the basis of the Hiss et al. (1978). However, the wording of questions was slightly changed from the questions in the original Hiss survey instrument to accommodate a different respondent group with a distinct culture. In addition, since this study focused more on the opinion leaders' influence in the adoption of the innovation, rather than serving as an information source(s), the question was worded accordingly. The question asked was "*after you first heard about e-Choupal, whom did you first approach to obtain more detailed*

information about e-Choupal?” We translated this question in Hindi, the local language. In this survey, one participant could nominate only one person.

Additionally, the survey had a diffusion question which asked “From whom did you heard about *e-Choupal* for the first time?” This question was asked to clarify if opinion leaders could be information sources in the diffusion process. The survey also contained several supplementary questions related to attributes of the innovation and attributes of the diffusion process, such as the initial information source and the local organizational affiliation.

Results

In analyzing the social network data, this study used *InFlow* 3.0 and SPSS 13.0. First, *InFlow* 3.0 generated network centrality measures and drew a social network map, and then SPSS 13.0 was used for the statistical analysis. For confidentiality, the personal identification was transformed into numbers.

Demographics of participants

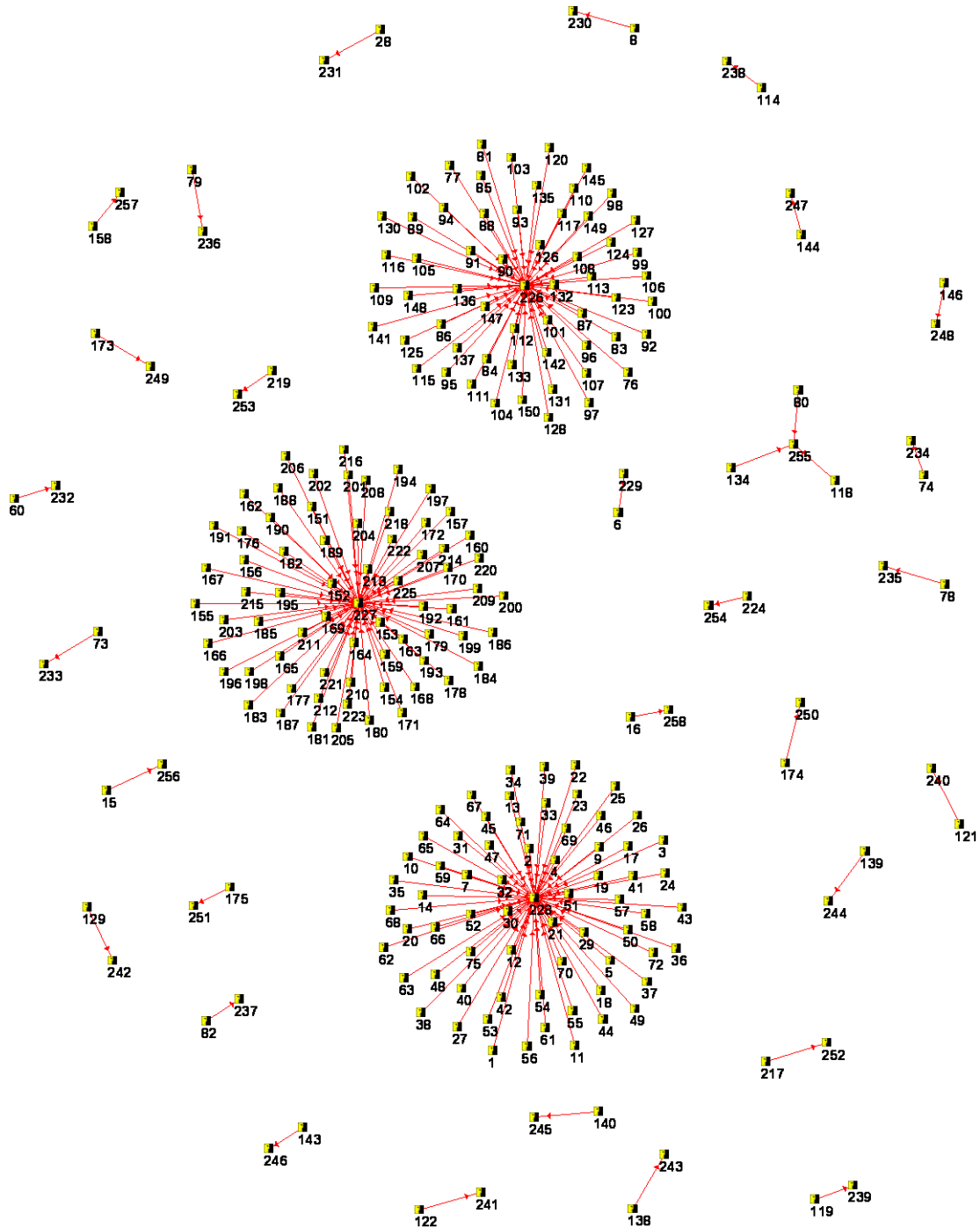
The participants’ age ranged from 19 to 87 (Total N=225), and 224 of the 225 men were married. The mean value of the number of people in a households was 8.29 (SD=4.01). In terms of education level, 21 people were illiterate, while 2 people are literate without institutional education, followed by primary school graduates (the majority, N=80), middle school (N=57), high school up to 10th grade (N=35), high school up to 12th grade (N=19), and more than high school education (N=11). The mean value of size of farm that each farmers owned was 11.57 acres (SD=10.90). Finally, only 8 people (3.6%) were affiliated with local organizations.

Who are the opinion leaders?

In our social network analysis, 200 individuals pointed out someone whose names were already on our survey list, and 25 people provided names that were not in

the survey list. From the communication network analysis of 225 individual farmers in 14 villages, apparently, three major and one minor network groups were identified through the communication network analysis. In addition, a salient opinion leader in each communication network was identified as shown in Figure 4.

Figure 4. Communication Network Map among e-Choupal Adopters



As Table 2 shows, group 1 had 59 individuals with 58 ties with only one person (no.=226) who was a *Sanchalak*; Group 2 (no.=227) had 69 individuals with 68 ties also with only one *Sanchalak*; Group 3 (no.=228) had 68 individuals with 67 ties with another *Sanchalak*. Only in group 4, the three ties were not with a *Sanchalak*, but with someone (no.=225) who is located in the center in their communication network. (See Figure 4 for more detailed social network analysis of the groups). As a result of both statistical and network map analyses, three *Sanchalaks* were identified as opinion leaders for the purposive diffusion of *e-Choupal*.

Table 2. Description of Social Network Analysis among 14 Villages

Group	Group size	Potential Ties	Actual Ties	Density	In-degree Measure (Individual = Value)	Betweenness Measure
Group1	59	3422	58	2	226 = 1	0
Group2	69	4692	68	1	227 = 1	0
Group3	68	4556	67	1	228 = 1	0
Group4	4	12	3	25	225 = 1	0

Are opinion leaders information sources?

Having the information that *Sanchalaks* were the opinion leaders, this study also revealed one more diffusion attribute of Indian farmers, “Did the opinion leaders also serve as initial information sources about *e-Choupal*? Table 3 shows the two main information sources: other farmers and *Sanchalaks*. Several farmers noted that they first heard about *e-Choupal* from a *Sanchalak* (N=117). However, other group of farmers also said that they first received information about *e-Choupal* from their friends and neighboring farmers (N=100). However, Chi-square test revealed that the

observed frequencies are statistically not different between the two groups, $\chi^2(1, N = 217) = 1.332, p = 0.248$.

Table 3. Information Sources of *e-Choupal*

Sources	Frequency	Percentage
Sanchalak	117	52.0
Other farmers (friends or neighbors)	100	44.4
ITC officials	3	1.3
Sarapanch	1	0.4
Family members	3	1.3
Wall painting / Brochure	1	0.4
Total	225	100.0

Discussion and Conclusions

This study investigated the communication network of farmers in 14 villages of Madhya Pradesh, India and identified among them the key opinion leaders in the diffusion of *e-Choupal*. The identified opinion leaders were *Sanchalaks*, who were selected and trained by the ITC and live where the *e-Choupal* systems are housed.

In terms of the in-degree centrality measure, it was very obvious that three *Sanchalaks* were nominated as opinion leaders by other farmers; they provided advice for other farmers to make use of *e-Choupal*. This result showing the extremely high degree of nomination of *Sanchalaks* as opinion leaders is unique in comparison with other social network analyses. Usually, other social network analyses with a large scale, such as this study having 14 villages, generate rather complex network maps and centrality measures. However, in this study, 193 out of 225 people (86%) pointed to three *Sanchalaks* between them as their opinion leaders. The social network map of *e-Choupal* adopters also clearly demonstrated the salience of *Sanchalaks* in their communication network.

The salience of *Sanchalaks* as opinion leaders could be related to the attributes of the Indian agricultural community. In Sen's (1969) study of opinion leadership in India, he explained five common attributes of opinion leaders in eight Indian villages:

- 1) They are fully integrated into the village society as shown by their conformity to village norms;
- 2) They are recognized power-holders in the community and maintain their status by conventional means;
- 3) They are sought by followers as opinion leaders because of their authority and competence;
- 4) They are not innovators; and
- 5) They maintain links with extra-village systems (p.27).

Results from the present study also suggests that opinion leadership in an Indian agricultural community reflects the society's hierarchical structure: that is, the influence wielded by authority figures. While many studies conducted in Western countries have shown the importance of peer-to-peer diffusion (Booth & Knox, 1967; Pereles et al., 2003; Valente et al., 2003), this present study reveals a far more hierarchical diffusion process. This has significant implications for the diffusion of agricultural innovations in Indian agricultural communities.

Another possible reason of the high saliency of *Sanchalaks* as opinion leaders may be due to the small number of opinion leaders in a large community. While *e-Choupal* is now increasingly recognized among Indian farmers, the system still needs to be extended to more centers. In the 14 villages of Madhya Pradesh that we studied, there were only three *Sanchalaks*. Three *Sanchalaks* in 14 villages are not enough to perhaps reach the level of *critical mass* in diffusion. According to Rogers (2003), critical mass is defined as "the point after which further diffusion becomes self-

sustaining” (p.343). Related to this idea of critical mass, the efforts or the use of active strategies to diffuse a new innovation should be continued, until diffusion meets the level of critical mass. On the way to reaching critical mass, innovation users are more interested in the quality of certain goods and services as the number of users increases, which is defined as network externalities (Mahler and Rogers, 1999). Based on this view, ITC needs to set up more *e-Choupal* centers and realize the key position of *Sanchalaks* in this endeavor. If ITC neglects these insights, a lack of network externalities would slow the rate of adoption of *e-Choupal*.

This study investigated if opinion leaders would take roles of both information sources (Lomas, 1993) and influentials on adoption decision (Weimann, 1994). Even though the opinion leaders were identified as a major information source on *e-Choupal*, there were a substantial number of other farmers who were not opinion leaders but were cited as information sources too. This result revealed that not all people introducing new innovations convince people to adopt the new innovations. This suggests that Indian farmers (at least in Madhya Pradesh) feel a need to confirm adoption decisions with opinion leaders, not with those who were the initial source of information about the innovation.

A reason of this difference between people of information sources and opinion leaders can be sought from previous opinion leadership studies. According to Greer (1988) and Conroy and Shannon (1995), opinion leaders are evaluators or locally respected colleagues who are trusted judges to determine how new innovations fit their local situations and if the innovations are appropriate in their communities having traditional social norms. In judging the fitness and appropriateness of new innovations, opinion leaders consider how the innovations may contribute to the development of their communities more than their followers (O’Brian, Raedeke, &

Hassinger, 1998). In this study, ordinary farmers in India's Madhya Pradesh state seem to trust the judgment of opinion leaders – the *Sanchalaks* – who provided insights about *e-Choupal's* fit with their needs.

Our finding also supports the general patterns of opinion leadership discussed in Rogers (2003) -- that is, opinion leaders have greater social participation and greater contact with change agents than their followers. From our data, while most farmers do not have an organizational affiliation, *Sanchalaks* have close relationship with ITC and with local organizations. In other words, *Sanchalaks* show more cosmopolite communication behavior. This attribute of opinion leadership is consistent with previous studies.

Finally, this study suggests a clear strategy to accelerate the diffusion of *e-Choupal* in India. Since *Sanchalaks* were clearly identified as the sole opinion leaders, more *Sanchalaks* can be cultivated as Kelly and his colleagues (1997) argued that opinion leaders can be intentionally created on purpose. What are the characteristics of *Sanchalaks* who serve as opinion leaders in the diffusion of *e-Choupal*? Our investigation revealed that they are literates, mid-size farmers who have good rapport with community members, and respected (Chitnis et al., 2007). These attributes of *Sanchalaks* can be suitably applied to other purposive diffusion projects in Indian villages.

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