

Adopters' Social Referent to Make Decision under Risks - A Case Study from Rainwater Harvesting Practice in the Coastal Bangladesh



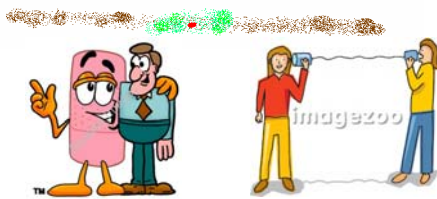
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An Innovation : Disaster Preventive Measure

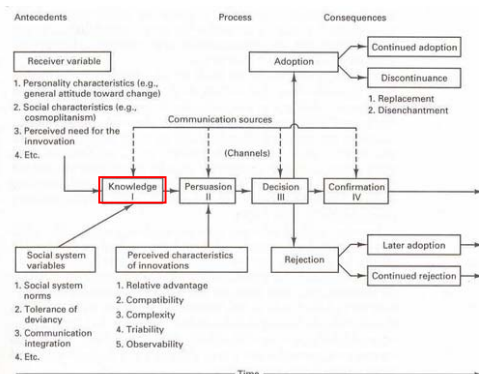


I don't know the advantages & disadvantages of the tank



□ Innovation Decision Process - Information Seeking and Information Processing Development or Activity

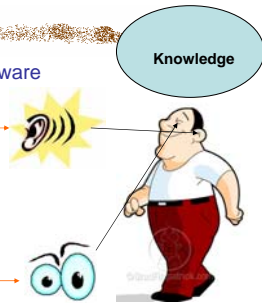
(Rogers, 1983, Becker , 1971, Coleman, 1964, Valente, 1995)



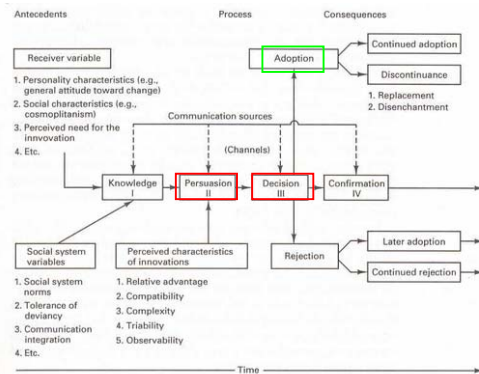
(Roger, 1983)

Diffusion Model

Hearing = Knowledge of Software components



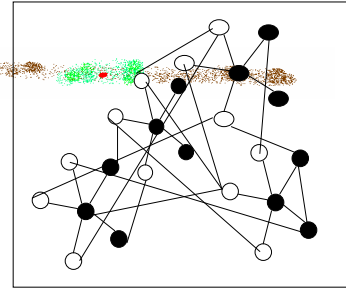
Observation = Knowledge of Hardware Components



(Roger, 1983)

Diffusion Model

Persuasion Stage And Decision Stage – Discussion Partners

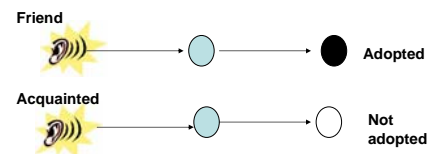


In the process of technology diffusion, the pattern of communication or information sharing among the adopters is a social network
(Rogers, 1983; Valente, 1995).

Types of Information and Social Networks

- Hearing
- Observation
- Discussion

Sources of Information



Who is adopter's social referent in which occasion??

Observation -

- Indirect technique, a monitoring activity.

Hearing and Discussion –

- Direct technique, two way communication.....
- But contents are different and
- Also information acquiring phase is different

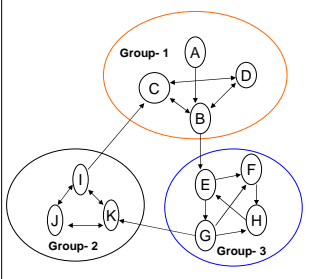
Adopters' Social Referent or Information Source

- Valente (1996) – Direct or personal social networks
- Granovetter (1973) – Indirect ties/ networks
- Burt (1987) – Similar Position in the Structure
- Samaddar and Okada (2007) – Spatial dimension

Type – 1 (Cohesive group)

Depends on the degree/ frequency of the tie/ social interaction

System Social Network – X



Role of Cohesive Group -

❑ Opportunities and Social Obligation

(Ibarra and Andrews, 1993; Shaw, 1998).

❑ Faster Information Sharing

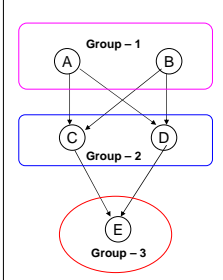
(Ibarra and Andrew, 1993, Levine and Moreland, 1990).

❑ Prohibits new ideas , provides only redundant information

(Granovetter, 1983).

Type – 2 (Structural Equivalence) Position and Role

Social Network (System) – Y



Two actors are structurally equivalent if they have identical ties to and form all other actors in the network

Example - Doctors in a hospital,
Students in a school

Role of Structural Equivalent Group

❑ Social Competition (Burt , 1993).

❑ Social Environment, Socialization process (Marsden and Friedkin ,1994)

Spatial group -

- Individual's behavioral similarity can be identified on the basis of geographical proximity.
- Physical proximity allows the individual to observe, learn other experiences and to share ideas and values of each other, which not only help an individual to become aware of an innovation, or to reduce risks by witnessing the consequences of adoption, but also neighborhood peers' adoption behavior create social pressure on the individual (Burt, 1987).

Research question

- ❑ Adopters depend on whom to acquire what kind of information ?



??

	Hearing	Observation	Discussion
Cultural group			
Religion			
Economic group			
Income			
Occupation			
Spatial Group			
Neighborhood			
Social Network Group			
Cohesive Group			
Structurally Equivalent group			

Case Study Area : Morrelganj Municipality



Rainwater Harvesting at Household Level

Total Tank Installed	53
General Tank Adopted	49
Tank Size	3200 liters, 4400 liters
Tank Cost	10000 Taka – 14000 Taka (16000 Yen – 20000 Yen)
Total time of tanks Installation	June, 2004 - August, 2007

Implementing Agency –
Community Development Center, Bangladesh, & People for Rainwater, Japan

Field Study

- Duration** – 1) July to August , 2007
 2) January to February, 2008
- Sample Size** : 49 tank adopter (who installed rainwater tank in Morrelganj municipality area till august, 2008)
- Respondent** – Head of the Household (All Male, except 3 female respondents)

Description of Socio-Metric Questioners

Hearing – “ Kindly name us three persons from where you have first time heard about the rainwater tank”

Observation – “ Kindly Name us three places or house where you first time observed the rainwater tank”

Discussion – “ Kindly Name us three persons with whom you have discussed about the rainwater tank before making final decision of tank adoption”

Social Interactions (Social Networks)

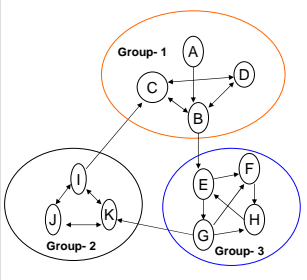
“ Kindly name us three tank owners in Morrelganj town with whom you often meet, talk or discuss in any issue in your daily life”



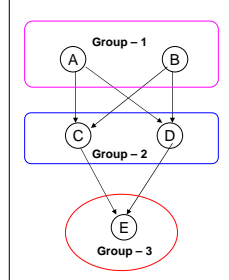
Cohesive Group

Structurally Equivalent Group

System Social Network – X

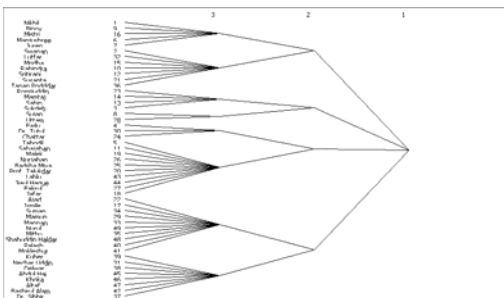


Social Network (System) – Y



Analytical Techniques

Structurally Equivalent Group



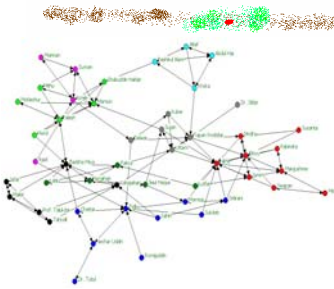
Partitions network data by splitting blocks based upon the CONvergence of iterated CORrelations (CONCOR).

(Description - Given an adjacency matrix, or a set of adjacency matrices for different relations, a correlation matrix can be formed by the following procedure. Form a profile vector for a vertex i by concatenating the i th row in every adjacency matrix; the i th element of the correlation matrix is the Pearson correlation coefficient of the profile vectors of i and j . This (square, symmetric) matrix is called the first correlation matrix.

The procedure can be performed iteratively on the correlation matrix until convergence. Each entry is now 1 or -1. This matrix is used to split the data into two blocks such that members of the same block are positively correlated, members of different blocks are negatively correlated.

CONCOR uses the above technique to split the initial data into two blocks. Successive splits are then applied to the separate blocks. At each iteration all blocks are submitted for analysis, however blocks containing two vertices are not split. Consequently n -partitions of the binary tree can produce up to $2n$ blocks.)

Cohesive Group

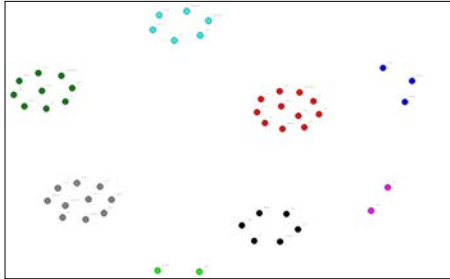


(Faction Method - Given a partition of a binary network of adjacencies into n groups, then a count of the number of missing ties within each group summed with the ties between the groups gives a measure of the extent to which the groups form separate clique like structures. The routine uses a tabu search minimization procedure to optimize this measure to find the best fit.)

EI - Index :

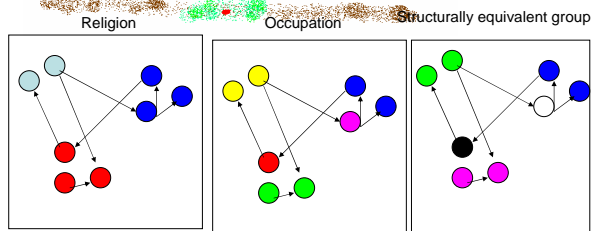
- Given a partition of a network into a number of mutually exclusive groups then the E-I index is the number of ties external to the groups minus the number of ties that are internal to the group

Tank Adoption in Different Neighborhoods



Religion	Hindu - 30.6 % Muslims 69.4%
Income	10000 Taka – 32.5 %; 20000 taka – 42. 8%; 30000 taka – 16.3%; 40000 taka – 8.2%)
Occupation	School Teacher – 36.7% , Business – 24.5%, College Teacher – 8.2%, Others – 30.6 %

Information sharing and social reference



Information sharing and social reference

Sharing various information and degree of homogeneity (E-I Index)

	Hearing	Observation	Discussion
Cultural group			
Religion	- 0.725	- 0.750	- 0.704
Economic group			
Income	0.333	0.364	0.333
Occupation	0.294	0.432	0.184
Spatial Group			
Neighborhood	- 0.294	- 0.114	- 0.333
Social Network Group			
Cohesive Group	- 0.294	0.114	- 0.259
Structurally Equivalent group	- 0.176	0.182	- 0.111

Results of Regression Analysis on Social Referents for hearing, observation and discussion

	Hearing	Observation	Discussion
Cultural group			
Religion	.002	.020	.002
Economic group			
Income	.001	.000	-.001
Occupation	.013	.012	.021
Spatial Group			
Neighborhood	.048	.090	.061
Social Network Group			
Cohesive Group	0.80	.072	.081
Structurally equivalent Group	0.27	.001	.018
R- Square	.84	.70	.80

Conclusions

- Higher the degree/ frequency of ties, higher is the information sharing tendency.
- Neighborhoods member may share stronger social relation, therefore, exchange information among themselves

Further research question

- In which stage of technology dissemination, who provides information to whom ?
- What type of information render the technology dissemination process

Thank You

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