People, SHGs and Social Objectives: A Formal Framework

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Abstract : A Self Help Group [SHG] is a small homogeneous gathering of persons who join on a voluntary basis in order to undertake some common activity through mutual trust and mutual help. SHG system is conceptualized primarily to address the problem of rural unemployment, and empowering people to make them economically self-dependent. But, there is a possibility of it being turned into a commercial unit negating the very thesis it espouses. We proposed a value based design of information system for SHGs to make them socially responsive by inculcating the social objectives such as collaboration, dependability, transparency and inclusiveness. The study includes formalization of structural and dynamic aspects of SHGs, and deals with the implementability of dynamic behavior that makes the system socially responsive by implementing the four objectives. We plan implementation of the concept in UML framework. The information system will be useful to the Funding Agency/Governing Body in identifying which of the members, SHGs, Banks, Third Party Merchants and NGOs are socially responsive i.e. collaborative, dependable, transparent and inclusive.

1 PROBLEM STATEMENT

The self-help groups (SHGs) have grown explosively in recent years and have become dominant in India. It was reported that by March 2006, 2.23 million SHGs reached about 33 million members. Such outreach appears to represent a major breakthrough in a country where 50 million households live in poverty, with very limited access to financial services. Thus the physical structure of the SHGs is very large, but relatively very less attention was given for research on the SHG management and formalization. Hence the problem we have considered includes the formalization of SHG management and achieving social objectives in SHGs. The purpose of having SHG information system is to improve SHG performance. The usability of the proposed system includes monitorability, providing information ûow to identify gaps and mismanagement, to facilitate system support and business collaboration. As of now, research was limited to making e-paper as a substitute for worksheets used by the SHG coordinators, schemes for collection of information from remote rural clients, MISs, PDAs for conducting ûnancial transactions in remote rural areas ,

elimination/reduction of cash handling through e-purses, etc. Research was also done to provide user interfaces for non-literate and semi-literate users for making epayments, smart cards with biometric technologies, etc. SHG system is conceptualized primarily for empow-

ering people, making them economically self-dependent. But, there is a possibility of it being turned into a commercial unit negating the very thesis it espouses. So, we need to ensure that the SHGs will not fail to keep the social objectives. We would like to propose a value based design of information system which ensures social responsibility of SHGs. The study includes formalization of structural as well as dynamic aspects of SHGs. We also study the ways to ensure the implementability of the four social objectives in addition to achieving business objectives and service delivery. Further, at different levels (e.g. regional, national,etc), the roles of SHGs in achieving a common target (say, national target, community target) will be formalized.

Motivation

SHGs can achieve their SHG-level objectives effectively through collaboration. And, collaboration at higher levels allows SHGs to achieve higher level objectives i.e. regional,state, and national level objectives. Suppose, a SHG level objective is to vaccinate one thousand children against polio. Practically, it will be very difûcult for one SHG to ûnd one thousand children in its area. Let us suppose another SHG in a different area whose objective is to cause AIDS/HIV awareness to one thousand families. It will be difûcult for this SHG to ûnd one thousand families in its area and to cause an effective awareness. So, these two SHGs can now collaborate and form alliances and divide their tasks. The task now gets simpler for both SHGs. Each one of them is now needed to reach only ûve hundred families. To the same family they visit for vaccination, they can create AIDS/HIV awareness. Thus the objective becomes more feasible. If there is a district level objective, such as counting all the physically handicapped people in

the district, and providing clutches and supporting equipment to them; then the SHGs in the district collaborate to achieve this objective. Some SHGs work on taking the census, and some working on making clutches and tools. Similarly the same kind of collaboration strategy works for state or national level objectives. Using collaborations, bigger objectives such as providing food security to the nation, providing nutrition to children, providing vaccination to all the nationals, etc can be achieved.

2 . TECHNICAL APPROACH: FORMAL FRAMEWORK FOR PERSON, SHG & SOCIAL OBJECTIVES

Our present approach is holistic and it helps in organized management of the SHGs. Through holistic approach we get better control and management on the SHGs' activities, assess the growth and development of SHGs effectively, identify the weaknesses and inefûciencies of SHGs, etc. The model of the SHGs that we are proposing consists of both business and social aspects to each SHG. The present models are about the business aspects of SHGs. Our model gives relatively equal priority to business and social aspects. Our model's goal is to see that the social objectives viz. collaboration, dependability, transparency, monitorability,
and inclusiveness are realized in the business activities of the SHGs. So, we want to design a framework which ensures the effective achievement of the social objectives in the SHGs' business and social aspects.

Modeling a Person:

Each SHG member in the system has the following features: A person has both social and business aspects. We formalize both these aspects. A person in a SHG is assigned or has subscribed to a particular business role in compliance with the business objective of the SHG. Similarly the person is assigned social activities by the SHG or he has subscribed to them as per his social interests. Socially, every person has personal preferences and interests. The person may also possess skills for doing the social work. For example, a person may have a diploma in Adult Education. Thus, a person has social interest as well as skill to materialize the interest.

As the activities of a person can be divided into two categories viz. social and business, a person will thus have social interests (PSI) and the necessary social skills (PSS) to materialize the social functions (PSF); and also business functions (PBF) and the necessary business skills (PBS) to complete the business functions.

PSI - person's social interests ; PSF- Person's Social Functions; PSS - person's social work skills; PBF - person's business functions; PBS - person's business skills; psi: person's social interest; psf: person's social-work function; pss: person's social-work skill; pbf: person's business function; pbs: person's business skill
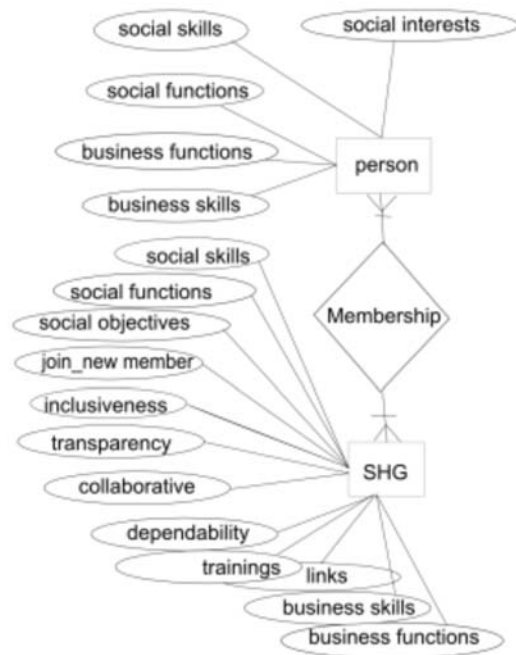

Figure 1: SHG-Member Relationship

A representation for a person 'P' can be given as:
P :: PSI * PSF * PSS * PBF * PBS

Some axioms regarding person:

(1). Every member of the SHG has social interests. " p " SHG, " psi " P SI | has(p, psi) Ë | psi | 6 = null

(2). Every social interest can be materialized by some social functions. So, every person with some social interests deûnitely has corresponding social functions. " psi " P SI, " psf " P SF | has(p, psf) Ë | psf | 6 = null

(3). Every person belonging to a SHG has speciûed business functions as determined by the SHG, basing on the nature of the SHG business, need of the hour and the skills possessed by the person " p " SHG, " pbf " P BF | has(p, pbf) Ë | pbf | 6 = null

(4). For the business functions to be feasible, the person must have the necessary business skills to complete the business functions. The person may be possessing the business skills beforehand or SHG may offer training. " pbf " P BF, feasible(pbf) Ò! " pbs " p | has(p, pbs) (" training(p, pbs)

(5). For the social functions to be feasible, the person must have the necessary social work skills to complete the social functions. The person may be possessing the social work skills beforehand or SHG may offer training " psf " P SF, feasible(psf) Ò! " pss " p | has(p, pss) (" training(p, pss)

(6). If all the social functions are feasible, it implies that the person's social interests are achievable " psf " P SF, feasible(psf) Ò! achievable < P SI >

(7). If all the business functions are feasible, it implies that the person's business functions are achievable "pbf " P BF, feasible(pbf) Ò! achievable < P BF >

Modeling a SHG:

Each SHG in the system has the following features:
The General Functionalities of each include member registration, membership cancellation, member migration, member saving, training members, SHG saving, loan procurement, loan repayment, loan disbursement, record keeping, etc. These General Functionalities are part and parcel of every SHG.
Domain Speciûc Functionalities are functions speciûc to a business domain. For example, if the domain is a milk production unit, then the domain speciûc functionalities of the SHG include raw milk collection, clariûcation of milk, puriûcation of milk, homogenization of milk, chilling of milk, processing of milk, yogurt preparation, milk powder preparation, milk products preparation, etc.
Generic Business Properties are the properties like proûtability, growth, employment, scalability, development,

efûciency, speed of operations, etc which deûne the performance of the business.
Generic Social Behaviors The social behaviors like trustworthiness, collaborativeness, dependability, inclusiveness, transparency & monitorability, accountability, reliability, responsiveness, cooperation, stability, etc are part of each SHG and deûne the social performance of the SHG.

A SHG can be represented as:
SHG(G): M * B * GBO * GSO * GBF * GSF * R * GBS *GSS * L
G=Group, M=members, B=Business name, GBO=Group's Business Objectives, GSO=Group's Social Objectives, GBF=Group's Business Functions, GSF=Group's Social Functions, GBS=Group's Business Skills,GSS=Group's Social Skills, L=Links(collaborations), bo=business objective, so=social objective, bf=business function, sf=social function, p=member, psi=member'social interests, pbf=member's business functions, psf=member's social functions, pbs=person's business skills, pss=person's social skills

Some axioms regarding SHGs:

1. Every group has Business Objectives(GBO) and Social Objectives(GSO) " G " SHG, " GBO, GSO | has(G, GBO) Ë | GBO | ! = null, has(G, GSO) Ë | GSO | ! = null

2. All business objectives(GBO) or social objectives(GSO) result in respective business and social functions(GBF,GSF) " bo " GBO, so " GSO " bf " GBF, sf " GSF | | bf | ! = null, | sf | ! = null

3. If all business functions and social functions are feasible, it implies that there exist necessary resources(r), skills(s) and collaborations(c) that make the functions feasible. The resources are either available with the SHG (G) or may be made available through collaboration with some other SHG (G'). Similarly, all the necessary skills are readily available with the SHG members (M) or they obtain through training or obtain from other SHGs through collaboration. " f " GBF (" GSF, feasible(f) Ò! " r, s, c | r " G (" r = c(G0), s " M (" s = training(M) (" s = c(G0)

4. If all the business functions (GBF) are feasible, it implies that the Group's business objectives (GBO) are achievable " f " GBF, feasible(f) Ò! achievable(GBO)

5. If all the social functions (GSF) are feasible, it implies that the Group's social objectives (GSO) are achievable " f " GSF, feasible(f) = Ò! achievable(GSO)

6. To achieve the business and social objectives, a group may follow the options such as joining new members or train the existing members or collaborate with other SHGs. achievable(GBO) Ò! join new(p) (" train(p) (" collaborate(G0) achievable(GSO) Ò! join new(p) (" train(p) (" collaborate(G0)

Social Objectives in SHGs

Every SHG must have social objectives such as collaboration, dependability, transparency & monitorability, and inclusiveness in its business. A business without social objectives may not do any good to the society and instead it might harm the socieity.

1. Collaboration: Collaboration is a process of achieving a goal by joint efforts. Having this process instilled in SHGs, makes the set up socially inclusive and productive. The 'set up' here we mean SHGs and their associated members. The process of collaboration in domain operates both at SHG level and individual level i.e. Inter-SHG and Intra-SHG collaboration. Before going into details of these categories of collaborations we will have a brief discussion on collaboration in general. A general logical pattern for collaboration is:
collaboration(G,e1,e2) a" (G = G1 U G2) & agreement(e1,e2,G) | does(e1,G1) & does(e2,G2)

Collaboration is a stronger deûned mutual help than cooperation; where former needs a formal agreement between collaborating entities e1 and e2 to accomplish the allocated goals that are part of G for which the entities are collaborating. An ER diagram of the entities involved in collaboration design pattern is as follows:

Figure 2: SHG Collaboration

Collaborations formed for achieving SHG level objectives involve a fewer SHGs as compared to collaborations formed for regional and national level objectives. By collaborating with each other SHGs improve their businesses.

Collaboration of SHGs: Formal Description

If (G(i).Resources_Availability == True) ||
G(i).Skills_Availability == True ||
G(i). Trainings_Availability == True) ||
G(i).Need_Resources == True ||
G(i).Need_Skills == True ||
G(i).Need_Trainings == True))
Then (G(i).Collaboration_Possiblity= True;
For two SHGs G(i) and (G(j):
If (G(i).Collaboration_Possibility==True &&
G(j).Collaboration_Possibility==True)
Then {
agreement(G(i),G(j), Resources[]))
agreement(G(i),G(j), Skills[]))
agreement(G(i),G(j), Trainings[])
}

2. Dependability: Dependability of a SHG is the certainness of a SHG in performing its designated tasks. A SHG should be dependable to the funding agency, members, and other SHGs. Dependability is a much sought after characteristic when the funding agency has high priority jobs and hence requires a SHG that ensures completion of the jobs. The SHG should be dependable to the member in that it should be able to provide support to the member in his time of need.

case 1: Dependability of the SHG to the funding agency. This dependability is of two types. Dependability in social work (D1), and dependability in business activities (D2). The total dependability of a SHG can be obtained by combining these two values D1 *" D2.
If Cp is cooperativeness, Cr is coordination, M is maintainability, S is safety, Tw is trustwothiness, Tr is transparency, R is reliability, Av is availability, PI is performance index, then dependability is given by:

Dependability, D = Ó(Cp, Cr, M,S, Tw,Tr,R,Av,PI)

Cooperativeness (Cp) is the willingness and ability of the SHG to work with other SHGs. Coordination(Cr) is the

synchronization and integration of activities, responsibilities, and command and control structures to ensure that the resources are used most efûciently in pursuit of the speciûed objectives. Maintainability is the capability of a SHG to cope with a changed business or objective. Safety is the relative freedom from danger, risk, or threat of harm, injury, or loss to personnel and/or property, whether caused deliberately or by accident. Reliability is the assurance that a SHG deserves to be trusted-that it will perform as expected despite environmental disruptions, human and operator error, hostile attacks, and design and implementation errors. Reliable systems reinforce the belief that they will continue to produce expected behavior and will not be susceptible to subversion. Trustworthiness is the credibility that a SHG earns by its fairness in its dealings. Trustworthiness can be computed by observing the patterns that a SHG follows in repaying the loans, paying other SHGs, sharing the proût among the members, savings, paying off the debts, etc. Transparency is the absence of hidden agendas and conditions, full disclosure of transactional and ûnancial information, accompanied by the availability of all other information required for collaboration, cooperation, and collective decision making. Availability is the ability of a SHG to perform its designated function, whenever required. Performance Index of a SHG is a value computed using the growth of the SHG in its ûnancial aspect, social work aspect, achievement of social objectives, members' growth, loan repayment, skills improvement, business growth, etc.

case 2: Dependability of the SHG to its member. A SHG is dependable to the member when it caters to the needs of the member. However, several factors affect the possibility of lending. The cohesion of the members (Cm) of the group deûnes how strongly they are united and committed to each other. If the cohesion among the members is strong, they will be considerate to the needs of the member in need. Since SHG lending is a group decision, they will vote in agreement. The ûnancial condition (F) of the SHG inûuences the possibility of lending, since a SHG that is not thriving, cannot risk lending the member. The history (H) of the member in his previous dealings also affects the possibility of lending. If the member has previously borrowed and repaid promptly, the creditworthiness of the member goes up. If the member has enough creditworthiness, then it contributes to the possibility of borrowing from his SHG.

dependability, $D = \acute{O} \, (\, C(m), F, H \,)$

case 3: Dependability of the SHG to other SHGs. If the SHG has a good performance index (PI), it attracts other SHGs to make alliances and also form partners. Performance Index can be calculated based on the number of tasks delegated and number of them completed. Trustworthiness(Tw) is the value attributed to the SHG by other SHGs who are already partners with this SHG. If the dealing of this SHG is fair in all matters, then they will add to the value of the trustworthiness. If a SHG has good performance index and trustworthiness, then other SHGs will consider it dependable.

dependability,$D = \acute{O} \, (\, PI, Tw \,)$

Dependability of a SHG to Funding Agency: Formal Description

If (G.Cooperativeness() == satisfactory &&
G.Coordination() == satisfactory &&
G.Maintainability() == satisfactory &&
G.Safety() == satisfactory &&
G.Trustworthiness() == satisfactory &&
G.Transparency() == satisfactory &&
G.Reliability() == satisfactory &&
G.Availability() == satisfactory &&
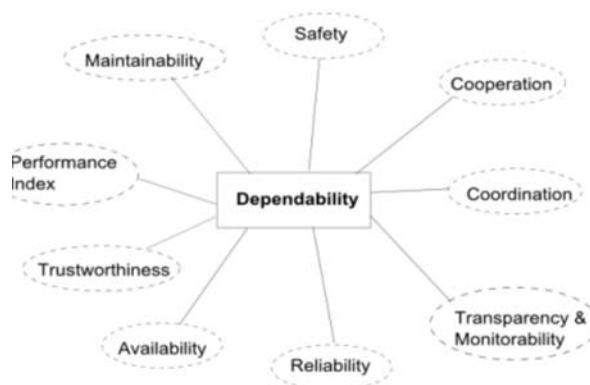G.PerformanceIndex() == satisfactory)
Then G.Dependability = Dependable

Figure 3: SHG Dependability

3. TRANSPARENCY & MONITORABILITY:
Transparency of a SHG is deûned as the absence of hidden agendas and conditions, full disclosure of transactional and ûnancial information, accompanied by the availability

of full information required for collaboration, cooperation, and collective decision making. All the activities of the SHGs must be transparent and monitorable. Transparency can be ensured by monitoring for consistency all the activities and transactions of a SHG. The interactions that are to be monitored are (Member, Member),(Member, SHG), (SHG, SHG'), (SHG,Bank), (SHG, TPM), (SHG, NGO)

Transparency(G)= Monitorability(M))" Monitorability(M,G))" Monitorability(G,G'))" Monitorability(G,Bank))" Monitorability(G, T P M))" Monitorability(G, NGO)
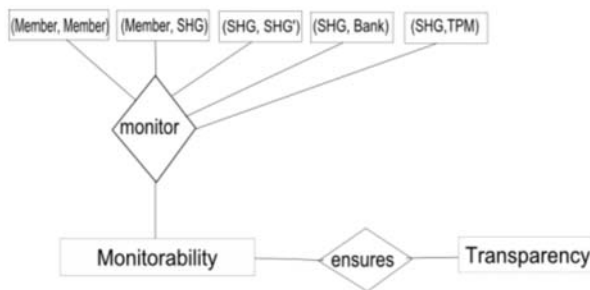
where M is member, TPM is third party merchant.

Figure 4: SHG Transparency & Monitorability

Transparency of a SHG: Formal Description
Check_Transparency(Member, Member) {
If(monitorable(Member, Member))
Then (Transparency(Member, Member))= True }
Check_Transparency(Member, SHG) {
If(monitorable(Member, SHG))
Then (Transparency(Member, SHG))= True}
Check_Transparency(SHG,SHG'){
If (monitorable(SHG,SHG))
Then (Transparency(SHG,SHG'))= True }
Check_Transparency(SHG,Bank){
If(monitorable(SHG,Bank))
Then (Transparency(SHG,Bank))= True }
Check_Transparency(SHG, Third_Party_Merchant){
If(monitorable(SHG,T_P_M))
Then (Transparency(SHG,T_P_M))=True}
Check_Transparency(SHG,NGO){
If(monitorable(SHG,NGO))
Then (Transparency(SHG,NGO))= True }
If(Transparency(Member, Member)== True &&

(Transparency(Member, SHG)== True &&
Transparency(SHG,SHG')== True &&
Transparency(SHG, Bank)== True &&
Transparency(SHG, T_P_M)== True &&
Transparency(SHG,NGO)== True)
Then SHG_Transparency = transparent

4. Inclusiveness: Inclusiveness is the capability of a SHG to allow the participation of more and more people, resources and skills in its business. According to noted psychologist Abraham Maslow's Hierarchy of Human Needs theory, a human being's need to belong in society is third only to a person's physiological and safety needs. Classic social exclusion deprives certain individuals of the basic human need of societal belonging because of circumstance, disability or economic status. Other forms of exclusion are due to race, religious belief, and gender. Inclusiveness ensures that no one and nothing is rejected, and everyone ûnds a place in the system. Every SHG must be inclusive in nature. As inclusiveness increases, sustainability of business increases. Inclusive function I is given by:

Inclusiveness, I(G)=involve(members)∩involve(resources) ∩involve(skills)

The involve function is the function which ensures the participation of members from various genres like varied genders, religions, races, economic statuses, etc. and resources and skills of various types.
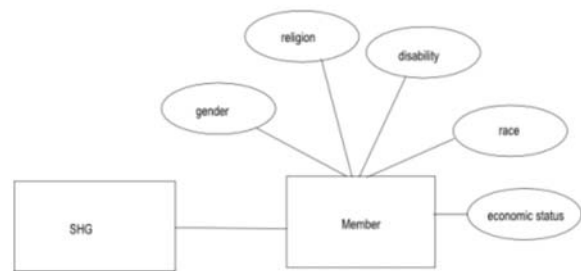

Figure 5: SHG Inclusiveness

Inclusiveness of a SHG: Formal Description
Inclusivness(G):
    involve(members);
    involve(resources);
    involve(skills);

3 RESULT

Businesses without social objectives tend to become corrupted and harmful to the society. And the proposed framework helps in instilling social responsibility in SHGs' businesses. Since the framework integrates the social agenda into the business model, social objectives become part and parcel of the business. Each SHG can be checked for its dependability, transparency, and inclusiveness. Collaborations among the SHGs are encouraged in order to increase the productivity of the SHGs. Studying the issues like collaboratiopn, dependability, transparency, and inclusiveness helps in implementing them practically in the SHGs.

CONCLUSION

In our present paper we have attempted to formalize SHGs and study the social objectives such as collaboration, dependability, transparency and inclusiveness. Each SHG might have some nuances but our model proposes the basic structure of a SHG. So, every SHG can inherit from our proposed model. All further additions pertaining to a particular SHG can be made thereafter. The effectiveness of our model can be regarded from the importance given to the social objectives. Our model prioritizes social objectives and their achievement. In future we intend to develop a SHG framework based on these social objectives. Each one of these social objectives needs an extensive study and formalization. As of now, we have only laid a base for the future work.

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