

PROBLEMS OF HOUSEMAIDS IN CHENNAI CITY-A STUDY USING FRM MODEL

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Abstract: Here the study of Problems faced by the housemaids working in Chennai is analyzed using simple Fuzzy Relational Maps (FRMs). The working atmosphere at home in Chennai differs a lot in day to day life. Here we analyze the problem by taking a pilot survey from 50 housemaids working in Chennai city and 20 Households that engage their services. This paper consists of four sections. The first section is introductory in nature that brings out the problems faced by the housemaids in Chennai city in which obtained through interview. Section two gives the description of FRM models. Section three deals with the study related to the problems faced by the housemaids working in Chennai city through the attributes of masters and housemaids and their analysis using FRM model. Section four gives the conclusion and suggestion based on the analysis.

Keywords: FRM Model, Fixed point, Hidden pattern, Relational matrix, Limit cycle, Housemaids, Dynamical system, State vector, etc.

Introduction: Servant is an old name which is now replaced by the term Domestic workers. They carry out lot of work like taking care of children, cooking, washing the vessels and clothes, sweeping the floor, arranging the home neatly, shopping, ironing the clothes etc. They act as a substitute in running the family of the masters. Hence there should be a mutual relationship between the masters and the housemaids for the smooth functioning of the work. In 2011, the International Labour Organization adopted the Convention Concerning Decent Work for Domestic Workers which covers decent work conditions for domestic workers. Recent ILO estimates based on national surveys and/or censuses of 117 countries, place the number of domestic workers at around 53 million. But the ILO itself states that "experts say that due to the fact that this kind of work is often hidden and unregistered, the total number of domestic workers could be as high as 100 million". The ILO also states that 83% of domestic workers are women and many are migrant workers.

Domestic services are mostly done by women. They suffer in various ways like no job security, long hours of work, meager salary, illtreated, oppressed, exploited, sexually harassed if the house maids is of young age. They have no job security as they don't enjoy legal protection. Though efforts are on, they continue to be unorganized and live a life of being 'hired and fired' by the masters.

2. Basics of Fuzzy Relational Map (FRM) Model:

2.1 Fuzzy Relational Map (FRM):

Initially the causal associations are divided into two disjoint units. To define a Fuzzy Relational Map these two disjoint units are taken as a domain space and a range space. Here the term disjoint we mean the sense of concepts which we have taken. Further

it is assumed that no intermediate relations exist among the domain elements itself and within the elements of the range space. In general, the number of elements in the range space need not be equal to the number of elements in the domain space. In this discussion, the elements of the domain space are from the real vector space of dimension n and the range space is of dimension m . Here n need not be equal to m . The domain space and the range space are denoted by D and R respectively. Thus $D = \{D_1, D_2, \dots, D_n\}$ is the domain space, where each $D_i = \{(x_1, x_2, \dots, x_n) \mid x_j = 0 \text{ or } 1\}$, for $i = 1, \dots, n$. Similarly $R = \{R_1, R_2, \dots, R_m\}$ is the range space, where $R_j = \{(x_1, x_2, \dots, x_m) \mid x_j = 0 \text{ or } 1\}$ for $j = 1, 2, \dots, m$.

Definition 2.1.1: A FRM is a directed graph or a map from Domain Space to Range Space with concepts like policies or events etc. as nodes and causalities as edges. It represents casual relations between spaces D and R .

Definition 2.1.2: The directed edge from D to R denotes the causality of D on R , called relations. Every edge in the FRM is weighted with a number in the set $\{0, 1\}$.

Definition 2.1.3: Let D_i and R_j denote the two nodes of an FRM. Let e_{ij} be the weight of the edge $D_i R_j$, $e_{ij} \in \{0, 1\}$. The weight of the edge $D_i R_j$ is positive if increase in D_i implies increase in R_j or decrease in D_i implies decrease in R_j . i.e., causality of D_i on R_j is 1. If $e_{ij} = 0$ then D_i does not have any effect on R_j . We do not discuss the cases when increase in D_i implies decrease in R_j or decrease in D_i implies increase in R_j . When the nodes of the FRM are fuzzy sets, then they are called fuzzy nodes, FRMs with edge weights $\{0, 1\}$ are called simple FRMs. Let D_1, \dots, D_n be the nodes of the domain space D of an FRM and R_1, \dots, R_m be the nodes of the range space R of an FRM.

Definition 2.1.4: Let the matrix E be defined as $E =$

(e_{ij}) where $e_{ij} \in \{0, 1\}$ is the weight of the directed edge $DiRj$ (or $RjDi$), E is called the relational matrix of the FRM. It is pertinent to mention here that unlike the FCMs, the FRMs can be a rectangular matrix; with rows corresponding to the domain space and columns corresponding to the range space. This is one of the marked differences between FRMs and FCMs.

Definition 2.1.5: Let D_1, \dots, D_n and R_1, \dots, R_m be the nodes of an FRM. Let $DiRj$ (or $RjDi$) be the edges of an FRM, $j = 1, 2, \dots, m, i = 1, 2, \dots, n$. The edges form a directed cycle if it possesses a directed cycle. An FRM is said to be acyclic if it does not possess any directed cycle.

Definition 2.1.6: An FRM with cycles is said to be an FRM with feedback. When the casual relations flow through a cycle in a revolutionary manner, the FRM is called a dynamical system.

Definition 2.1.7: Let $DiRj$ (or $RjDi$), $1 \leq j \leq m, 1 \leq i \leq n$. When Rj (or Di) is switched on and if causality flows through edges of the cycle and if it again causes Rj (or Di), we say that the dynamical system goes round and round. This is true for any node Rj (or Dj) for $1 \leq i \leq n$, (or $1 \leq j \leq m$). The equilibrium state of this dynamical system is called the hidden pattern. If the equilibrium state of the dynamical system is a unique state vector, then it is called a fixed point. Consider an FRM with $R_1 \dots R_m$ and $D_1 \dots D_n$ as nodes. For example let us start the dynamical system by switching on R_i or D_i . Let us assume that the FRM settles down with R_i and R_m (or D_1 and D_n) on i.e. the state vector remains as $(1 \ 0 \ \dots \ 0 \ 1)$ in R [or $(1 \ 0 \ \dots \ 0 \ 1)$ in D], this state vector is called the fixed point. If the FRM settles down with a state vector repeating in the form $A_1 \rightarrow A_2 \rightarrow \dots \rightarrow A_i \rightarrow A_1$ or $(B_1 \rightarrow B_2 \dots B_i \rightarrow B_1)$ then this equilibrium is called a limit cycle.

2.1.8 Determination of Hidden pattern: Let R_1, \dots, R_m and D_1, \dots, D_n be the nodes of a FRM with feedback. Let E be the relational matrix. Find a hidden pattern when D_1 is switched ON, that is when an input is given as vector $A_1 = (1 \ 0 \ 0 \ \dots \ 0)$ in D_1 the data should pass through the relational matrix E . This is obtained bymultiplying A_1 with the relational matrix E . Let $A_1 E = (r_1, \dots, r_m)$ after thresholding and updating the resulting vector $A_1 E$ we get a vector B . Now we pass on B onto E^T to

obtain BE^T . We update and threshold the vector BE^T so that the BE^T is equal to A_2 . This procedure is repeated till we get a limit cycle or a fixed point.

2.2 Justification for using FRM:

1. Since we cannot categorically express the cause of failure in any statistical data we are forced to use fuzzy models for this study.
2. The data is an unsupervised one.
3. Since the attributes are based on the relation between a master and a housemaid, we divide the casual associations into two disjoint units as domain space and range space.
4. Hence FRM model is best suited for this study.

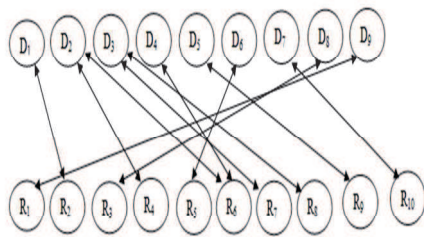
3. Analysis of Problems of housemaids in Chennai city using FRM: We have taken the domain space as the concepts given by the masters and servants as D_1, \dots, D_9 regarding the way the housemaids are treated:

- D_1 -Paying less salary
- D_2 -Illtreatment
- D_3 -Sexual Abuse
- D_4 -Making the housemaids to work for long hours
- D_5 -Treating with suspicion
- D_6 -Treating as a family member
- D_7 -No fixed time schedule for work
- D_8 -Being kind, friendly, considerate
- D_9 -Giving bonus for the occasion such as Christmas/ Deepavali

We have taken 10 nodes / concepts related to the feelings of housemaids during their work as expressed by them: These concepts form the range space which is listed below.

- R_1 - Happy and contented
- R_2 - Unsatisfied
- R_3 - Being loyal to the masters
- R_4 -Disrespectful to the master
- R_5 - Considering himself as the master
- R_6 -Feeling Depressed
- R_7 -Feeling insecure
- R_8 -Oppressed and exploited
- R_9 -Hypocratic
- R_{10} -Doing any kind of work for money

The relational directed graph is given below
The associated matrix is given below.



$$E_1 = \begin{bmatrix} 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

3.1.1 State vector in which the node D₃ (Sexual abuse) is kept in ‘on-state’:

Consider the node D₃, “Sexual Abuse” to be in the on state and rest of the nodes in the off state.

i.e $G_1 = (0010000000)$.

Then $G_1 E_1 = (0000001100) = H_1$

$H_1 E_1^T \rightarrow (0010000000) = G_2$

$G_2 E_1 = (0000000110) = H_1$

When the node D₃ is in the on state we get a fixed pair as $\{(0010000000), (0000001100)\}$, i.e R₇, R₈ are on the on state. The housemaids are feeling insecure, oppressed and exploited.

3.1.2 State vector in which the node D₂ (Illtreatment) is kept in ‘on-state’:

Consider the node D₂, “Illtreatment” to be in the on state and rest of the nodes in the off state.

i.e $G_1 = (0100000000)$.

Then $G_1 E_1 = (0001010000) = H_1$

$H_1 E_1^T \rightarrow (0101000000) = G_2$

$G_2 E_1 \rightarrow (0001010000) = H_1$

When the node D₂ is in the on state we get a fixed pair as $\{(0101000000), (0001010000)\}$, i.e R₄, R₆ are in the on state. The housemaids are disrespect to the masters and feel depressed at their working atmosphere.

Now we analyze from the range set

3.1.3 State vector in which the node R₆ (Feeling Depressed) is kept in ‘on-state’:

Let us take the state vector where the node R₆, “Feeling Depressed” to be in the on state and rest of the nodes in the off state.

i.e $S_1 = (0000010000)$.

$S_1 E_1^T = (0101000000) = T_1$

$T_1 E_1 \rightarrow (0001010000) = S_2$

$S_2 E_1^T \rightarrow (0101000000) = T_1$

We get the fixed pair as $\{(0101000000), (0001010000)\}$

When the node R₆, “Feeling Depressed” is in the on state we get D₂, D₄ are in the on state. When “Feeling

Depressed” is in the on state, Illtreatment and Making the housemaids to work for long hours comes to be in the on state.

3.1.4 State vector in which the node R₁ (Happy and Contented) is kept in ‘on-state’:

Consider the node R₁ ‘Happy and Contented’ to be in the on state and rest of the nodes in the off state.

i.e $S_1 = (1000000000)$.

$S_1 E_1^T = (0000000001) = T_1$

$T_1 E_1 = (1000000000) = S_1$

We get the fixed pair as $\{(0000000001), (1000000000)\}$ When the node R₁ is in the on state we get D₉ in the on state. The housemaids feel happy and contented with their masters when they receive their bonus at the occasion of festivals like Christmas, deepavali.

Conclusion: According to the analysis, sexual abuse concur with oppression, exploitation and insecurity. The housemaids working in any house, when they are less paid for their work they feel unsatisfied for their job. Making them to work for long hours resulted in depressed condition and showing disrespect to the master. Treating them with suspicious makes them to work as hypocrites. When the masters treat the housemaids as their family members they consider themselves to be the master of the family and act accordingly at all situations. No fixed time schedule for work resulted in doing any kind of work for money. When the masters behave friendly, considerate and kind to their housemaids, they are loyal to the masters and help the masters at all circumstances. Giving bonus and increments at special occasion like Christmas, Deepavlai resulted in making them happy and contented at their work.

Suggestion: As in western countries, there need to be laws protecting the rights of the housemaids. They need to be organized and the laws should stipulates working norms, paid holidays, maternity leave, etc promising them the job security and minimum way.

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