

Study On The Impact Of Media In Tamilnadu Using Fuzzy Cognitive Map

M. Mohamed Salih Mukthar

Assistant Professor, PG and Research Department of Mathematics,
C. Abdul Hakeem College (Autonomous)

Email: salih_kmc@yahoo.com

Abstract- In this paper, we discuss about the fuzzy cognitive map and the method of finding the hidden pattern. Mainly, we study about the impact of Media in Tamil Nadu using fuzzy cognitive map.

Keywords- Fuzzy cognitive map, Hidden pattern, Media

1. INTRODUCTION

The term media is defined as one of the means or channels of general communication in society, as newspapers, radio, television, online networks, etc. After 'tech savvy' it is the 'social media savvy' that has become synonymous with today's generation. About 2/3rd of Indians online spend time on different social networking sites like Facebook, Twitter, YouTube, Pinterest, etc. Even the trend of sending personal emails seems to have become obsolete as compared to social media. But why is this media becoming so popular in India? Interaction, live chat, status updates, image- as well as video-sharing are few of the major aspects that play a role in the popularity of social media. On the other hand, customer's responses, interaction and brand awareness is why the companies are using social media in India and across the globe. Thereby, multiple roles played by social media beyond its core role of mere communicating information are leading to its popularity.

By December 2012, the number of social media users in urban India had reached 62 million. A sudden availability of smart phones and mobile Internet has led to a spurt in the use of social media. All the business ventures in India rely on social media to understand their consumer base, for brand awareness and interaction. Indian netizens use social media to build virtual communities, groups and to interact and chat. So, there is no doubt that Information and Technology, in particular rapidly increasing social media plays an important role in shaping the mind of customers towards certain products and brands. At the same time, it is used for entertainment and leisure by most of the Indians online. Each day, about 100 million Indians are engaged in social media, more than the population of Germany.

There are four pillars for the development of society. Among four, media is one important pillar. So, let us discuss about the impact of media in Tamil Nadu using Fuzzy cognitive map.

First we discuss the basic concepts of Fuzzy cognitive map and hidden pattern from [1], [3], [4] and [5].

1.1 Definition A fuzzy cognitive map is a combination of fuzzy logic and cognitive mapping. Cognitive mapping is based on graph theory, which is also the basis of most calculations and indices. A fuzzy cognitive map is a directed graph with concepts like policies, events, etc as nodes and causalities as edges. It represents causal relationship between concepts.

1.2 Definition Let C_1, C_2, \dots, C_n be the nodes(vertices) of an FCM. Let $A=(a_1, a_2, \dots, a_n)$, where $a_i \in \{0,1\}$. A is called the instantaneous state vector and it denoted the on off position of the node at an instant

$a_i = 0$ if a_i is off, where $i = 1, 2, \dots, n$

$a_i = 1$ if a_i is on, where $i = 1, 2, \dots, n$

1.3 Definition Let C_1, C_2, \dots, C_n be the nodes of an FCM. Let $C_1C_2, C_2C_3, \dots, C_iC_j$ be the edges of the FCM ($i \neq j$). Then the edges form a directed cycle. An FCM is said to be cyclic if it possesses a directed cycle. An FCM is said to be acyclic if it does not possess any directed cycle.

1.4 Definition An FCM with cycles is said to have a feedback. When there is a feedback in an FCM, the FCM is called a dynamical system. The equilibrium state for this dynamical system is called the hidden pattern.

2. METHOD OF FINDING THE HIDDEN PATTERN

Let C_1, C_2, \dots, C_n be the nodes of an FCM, with feedback. Let E be the adjacency matrix. Let us find the hidden pattern when C_1 is switched on. When an input is given as the vector $A_1 = (1, 0, 0, \dots, 0)$, the data should pass through the relation matrix E . This is done by multiplying A_1 by the matrix E . Let $A_1E = (a_1, a_2, \dots, a_n)$ with the threshold operation that is by replacing a_i by 1 if $a_i > k$ and a_i by 0 if $a_i < k$ (k is suitable positive integer). We update the resulting concept. The concept C_1 is included in the updated vector by making the first coordinate as 1 in the resulting vector. Suppose $A_1E \rightarrow A_2$, then consider

A₂E and repeat the same procedure. This procedure is repeated till we get a limit cycle or a fixed point.

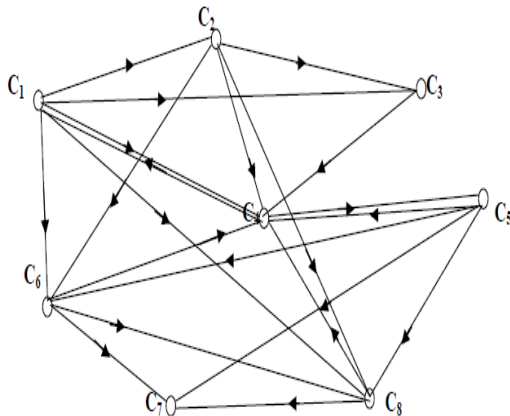
3. ANALYSIS OF THE IMPACT OF MEDIA IN TAMIL NADU USING FCM

3.1 Concept Of The Problem

Using linguistic questionnaire and the experts' (People) opinion, we have taken the following eight concepts {C₁, C₂,..., C₈}

- C₁: Live telecast at emerging situation
- C₂: Debate in Media
- C₃: Awareness of People
- C₄: Service to the People
- C₅: Getting new connections through online media
- C₆: Spreading the messages through online media
- C₇: Misguidance
- C₈: Entertainment

Based on the experts' opinion, we get the following directed graph as follows:



Now, we find the adjacency matrix of order 8x8

(since there are 8 concepts) for the above directed graph.

Adjacency matrix

$$A = \begin{pmatrix} 0 & 1 & 1 & 1 & 0 & 1 & 0 & 1 \\ 0 & 0 & 1 & 1 & 0 & 1 & 0 & 1 \\ 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 1 & 1 & 1 \\ 0 & 0 & 0 & 1 & 0 & 0 & 1 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 & 1 & 0 \end{pmatrix}$$

Using this adjacency matrix of the FCM, we determine the hidden pattern in the following manner:

First let us assume that C₄ is on state. (Since Service to the people is the main aim of started any media)

i.e., assume

$$X_1 = (0 \ 0 \ 0 \ 1 \ 0 \ 0 \ 0 \ 0)$$

Then

$$X_1 A = (1 \ 0 \ 0 \ 0 \ 1 \ 0 \ 0 \ 0) = X_2$$

$$X_2 A = (0 \ 1 \ 1 \ 2 \ 0 \ 2 \ 1 \ 2)$$

$$\rightarrow (0 \ 1 \ 1 \ 1 \ 0 \ 1 \ 1 \ 1) = X_3$$

$$X_3 A = (1 \ 0 \ 1 \ 4 \ 1 \ 1 \ 2 \ 2)$$

$$\rightarrow (1 \ 0 \ 1 \ 1 \ 1 \ 1 \ 1 \ 1) = X_4$$

$$X_4 A = (1 \ 1 \ 1 \ 5 \ 1 \ 2 \ 3 \ 3)$$

$$\rightarrow (1 \ 1 \ 1 \ 1 \ 1 \ 1 \ 1 \ 1) = X_5$$

$$X_5 A = (1 \ 1 \ 2 \ 6 \ 1 \ 3 \ 3 \ 4)$$

$$\rightarrow (1 \ 1 \ 1 \ 1 \ 1 \ 1 \ 1 \ 1) = X_5$$

Here → denotes the resultant vector after thresholding and updating
Finally, we get X₅ is the hidden pattern since it is the fixed point.

4. CONCLUSION

On analyzing the impact of Media in Tamil Nadu using FCM, when the concept C₄ "Service to the People" is on state, all the states are on state. So, we conclude that the media should telecast live programs on emerging situations; organize debate with the right persons; allow the people to get new connections and spread the good messages through online networks; avoid the misguidance; then finally, people should get awareness.

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