

Studies on Employees Emotional and Legal behaviors using Fuzzy Petri Nets

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Abstract

This paper deals on how the employee's emotions affect the organizational growth and legal behaviors. The aim of the study is to device the system based on fuzzy Petri nets for analyzing the same above. Fuzzy Petri nets models are very helpful for specifying the expert systems with imprecise description of rules. More research is being conducted on how the employee emotions affect the growth of the organization .But the results are unclear or imprecise .In order to avoid the limitations we construct the fuzzy Petri nets for the domain of employees emotions and legal behaviors.

Keywords: Fuzzy rules, high-level fuzzy Petri nets, employee emotion and legal behaviors

INTRODUCTION

An emotion in the workplace plays a key role in how an entire organization communicates within itself and also to the world outside. Emotions are everywhere in the work place and dealing with them at work is unavoidable. Emotions can be categorized as positive and negative emotions. Positive emotions in the workplace help employees obtain favorable outcomes including achievement, job enrichment and higher quality social context". "Negative emotions, such as fear, anger, stress, hostility, sadness, and guilt, however increase the predictability of deviance,". When employee get negative emotions he starts to focus more on the problems and less on the work. It leads in losing the precious work time and productivity of the particular organization. When the employer starts listening about

the problems faced by the employee, it can sort out the number of problems. Thus by making the work environment happier and also leading to the increased productivity. Hence in order to implement such a tool, in this study we try to establish the construction of fuzzy Petri nets for this context.

MATERIALS AND METHODS

Fuzzy Petri Nets-a short Introduction: Petri Nets (PN) are a graphical and mathematical modeling tool. They are used for describing and studying information processing systems. This system is characterized as being concurrent, asynchronous, distributed, parallel, nondeterministic and/or stochastic [9]

A fuzzy Petri Net model has [FPN] [2, 11] places and transitions, which are denoted by rings and rectangle. Each place represents an antecedent or consequent and may or may not contain a token associated with a truth degree between zero and one that represents the level of trust within the legitimacy of the antecedent or consequent. Each transition is associated with a certainty factor value between zero and one. The certainty factor denotes the strength of the belief in the rule. A directed arc (Edges) represents relationship between places and transitions and vice versa. The formal definition is given below, given below, [3,6]

Generally a FPN structure can be defined as an 8 – tuple:

$$\text{FPN} = \{P, T, D, I, O, \alpha, \beta, \gamma\}$$

Where

$P = \{p_1, p_2, \dots, p_n\}$ is a finite set of places

$T = \{t_1, t_2, \dots, t_n\}$ is a finite set of transitions

$D = \{d_1, d_2, \dots, d_n\}$ is a finite set of propositions.

$$P \cap T \cap D = \emptyset, |P| = |D|$$

$I: P \times T \rightarrow \{0,1\}$ is the input function a mapping from places to transitions

$O: T \times P \rightarrow \{0,1\}$ is the output function, a mapping from transition to places.

$\alpha: T \rightarrow [0,1]$ is an association function, a mapping from transitions to [0.1]
i.e., certainty factor

$\beta: P \rightarrow [0,1]$ is an association function, a mapping from places to [0.1] i.e., the truth degree

$\gamma: P \rightarrow D$, is an association function, a mapping from places to proportions

Mapping the rule base to FPN: Throughout this mapping technique, all principle is represented as transitions with its relating certainty factor and each antecedent is displayed by an input place and therefore the consequents are incontestable by an output place with scrutiny truth degrees. During the display of this transition, a suggestion is enabled to be fired, if their entire input places have a truth degree. After firing the rule, the output place can have a truth degree resembling the input place. The truth degree is multiplied by the transition certainty factor.

Fuzzy Petri nets (Fpns): [1, 2, 4, 5,7, 8, 10, 13, 14] are utilized for learning illustration what is more thinking within the section of imprecise information and learning bases. Fpns like AND-OR neurons [3, 6]

Normally, a collection of transitions emulated by a collection of places constitutes a layer. An l-layered like Petri net on these lines holds l- layers of moves emulated by places. It may also have an additional embody layer comprising of places simply. The places within the last layer are known. This kind of system has 2 types of benefits. To start out with, it will communicate with inaccurate learning like normal FPNs. Secondly, the system may well be ready with a collection of input-output examples (as in an exceedingly food forward neural net).

The survey for this paper had been successfully completed with Celebrity fashions limited. Celebrity fashions limited is one of India's consummate garments exporters with the capability to manufacture the largest number of trousers in the industry. The company has their own national premier men's wear brand, Indian terrain. The company has two subsidiaries namely Indian terrain fashions Ltd and Celebrity clothing Ltd. Our survey is based on the Mepz branch (Chennai) of celebrity fashions ltd .It has 1,200 employees working on it. Celebrity fashions reads the mindset of the current generation customers, continuously upgrade its facilities to set new benchmarks in the garment manufacturing industry by always keeping to its quality, design and time commitments.

We conducted the survey very successfully and collected the data as we planned; we partitioned the data into 15 parts obtained from the answers. We also categorize the data according to the nature of the answers as input and internal properties. This is described in the following sub section.

The input properties:

Distributive justice

1. My work schedule is fair.
2. I think that my level of pay is fair.
3. I consider my work load to be quite fair.
4. Over all, the rewards I received here are quite fair.

Procedural justice

1. During my performance evaluation, my employer showed a real interest in trying to be fair.
2. During my performance evaluation, my employer was honest in dealing with me.
3. During my performance evaluation, my employer considered my views about my performance.

Psychological contract breach

1. Almost all the promises made by my employer during recruitment have been kept so far.
2. So far my employer has done an excellent job of fulfilling its promises to be.
3. I have not received everything promised to me in exchange for my contributions.
4. My employer has broken many of its promises to me even though I've upheld my side of the deal.

Trust in organization

1. I believe my employer has high integrity.
2. I can expect my employer to treat me in a consistent and predictable fashion.
3. My employer is not always honest and truthful.
4. In general, I believe my employer's motives and intentions are good.

The internal properties:

The inside properties of the framework are made on the groundwork of some arrangement of the info properties:

- The input properties Q1 to Q4 form an internal property called "Distributive justice".
- The input properties Q5 to Q7 form an internal property called "Procedural justice".
- The input properties Q8 to Q11 form an internal property called "Psychological contract breach".
- The input properties Q12 to Q15 form an internal property called "Trust in organization".

As it where we have a fuzzy deduction in two levels. Level one is supposed to deduce the internal properties, level two is supposed to deduce the employee's emotional and legal behaviors based on the internal and input properties.

Level 1:

If Q1 to Q4 is then "Distributive justice" is

If Q5, to Q7 isthen "Procedural justice" is

If Q8 to Q11 isthen “Psychological contract breach” is

If Q12 to Q15 isthen “Trust in organization” is

Level 2:

Each of the unfilled spaces is loaded with a linguistic value: Strongly disagree (vl), disagree (l), Neutral (m), Agree (h), Strongly agree (vh). An example principle base for the above careful investigation could be displayed as an Employee emotional and legal behavior (EMLB) as the accompanying structure indicated in Fig. 1:

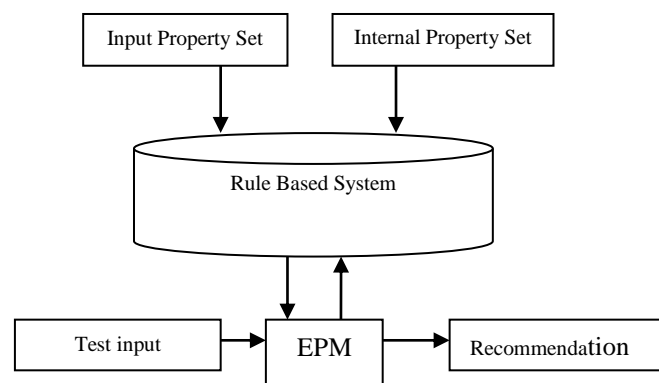


Figure 1. The decision model

$$EMLB = (Emp, IPS, InPS, OPS, RS)$$

$$EMLB.IPS = \{“Q1, Q2, Q3, Q4, Q5, Q6, Q7 to Q15”\}$$

$$EMLB. InPS = \{Internal properties\}$$

$$EMLB.OPS = \{Emp emo \& legal beh\}$$

$$EMLB.RS = \{R1, R2R10\}$$

$$R1 = Q1 (m) \wedge Q2 (l) \wedge Q3 (l) \wedge Q4 (m), “Distributive justice (m)”$$

$$R2 = Q5 (h) \wedge Q6 (m) \wedge Q7 (h), “Procedural justice (h)”$$

$$R3 = Q8 (h) \wedge Q9 (h) \wedge Q10 (l) \wedge Q11(vl), “Psychological contract breach (l)”$$

$$R4 = Q12 (h) \wedge Q13 (h) \wedge Q14 (vl) \wedge Q15 (vh), Trust in organization (h)”$$

$$R5 = Q1 (h) \wedge Q2 (l) \wedge Q3 (h) \wedge Q4 (h), “Distributive justice (h)”$$

$$R6 = Q5 (vh) \wedge Q6 (h) \wedge Q7 (vh), \text{“Procedural justice (vh)”}$$

$$R7 = Q8 (vh) \wedge Q9 (vl) \wedge Q10 (h) \wedge Q11 (vh), \text{“Psychological contract breach (vh)”}$$

$$R8 = Q12 (vl) \wedge Q13 (vl) \wedge Q14 (vh) \wedge Q15 (vl), \text{“Trust in organization (vl)”}$$

$$R9 = \text{Dist just (h) } \wedge \text{ Procedural justice (h) Psycho cont breach (m) } \wedge \text{ Trust in org (h),}$$

$$\text{“Organization citizenship behavior (m)”}$$

$$R10 = \text{Dist just (l) } \wedge \text{ Procedural (h) Psycho cont breach (vl) } \wedge \text{ Trust in org (vl),}$$

$$\text{“Organization citizenship behavior (vl)”}$$

In the above structure, Employee emotional and legal behavior (EMLB) is presented inside a 5-tuple comprising of the Input Property Set (IPS), Internal Property Set (InPS); Output Property Set (OPS) and Rule Set (RS). Q1 to Q15 represent Question 1 to 15 as input properties. Distributive justice, Procedural justice, Psychological contract breach, Trust in organization as internal properties. Terms vl, l, m, h and vh represent the linguistic value: very low, low, medium, high, very high, respectively. In the guideline, the second component demonstrates the antecedent, the third component indicates the consequent and the last number demonstrates the certainty factor committed to the rule.

For instance Rule 1 is as follows:

$$\text{EMLB.R1} = Q1 (m) \wedge Q2 (l) \wedge Q3 (l) \wedge Q4 (m), \text{Distributive justice (m).}$$

If Q1 is medium and Q2 is low and Q3 is low and Q4 is medium, then the Distributive justice is medium.

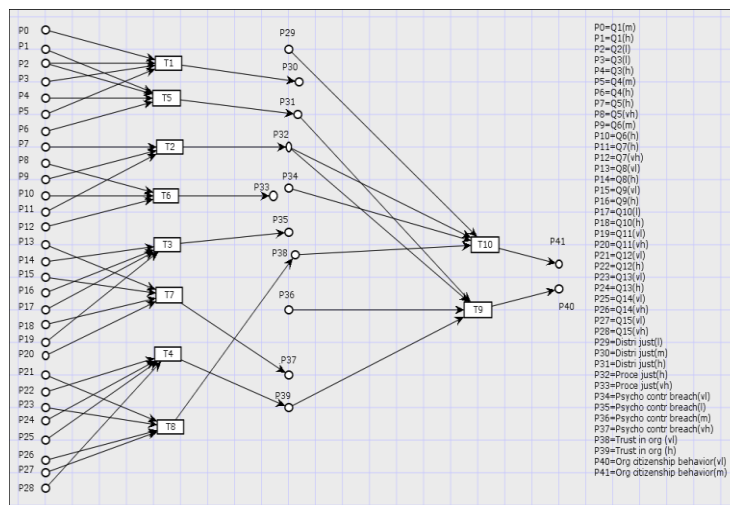


Figure 2: CPN Tool snapshot for EMLB

CONCLUSION

The system based on fuzzy Petri nets has been build and verified for an instance involving a corporate environment, celebrity fashions limited. This can be extended with other key performance indicators.

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