A Study of Work Related Stress Factors Affecting Work Life Balance using Combined Overlap Block Fuzzy Cognitive Mapping (COBFCM)

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Abstract - Work related stress factors play a major role in the work life balance irrespective of the personal stress factors, organizational setups and other factors. The work life stressors of every individual affect the Work-life harmony and work efficiency. In this study an attempt is made to study about the work related stressors which affect on the work life harmony and ultimately results in work life imbalance. The experts' linguistic opinions are analyzed using Combined Overlap Block Fuzzy Cognitive Mapping (COBFCM) model to find out the work related stressor which is the major reason for work life imbalance and affects the work life harmony.

Keywords: Stress, Work related Stressors, Work Life balance, Combined Overlap Block Fuzzy Cognitive maps

I. INTRODUCTION

1.1 Stress
Stress is a natural factor that acts from inside or outside of the world and influencing the individual. Every response to stress will affect the particular individual as well as the environment. As we experience the high stress in day today life, we often perceive it as a negative experience; however, the stress can also be experienced as positive to some extent. In general, stress is related to both external and internal factors. External factors include the physical environment, including job, relationships with others, challenges, difficulties and expectations deal with on a daily basis. Internal factors decide the way to respond and deal with the external stressors. Internal factors which influence the ability to handle stress include nutritional status, overall health and fitness levels, emotional well-being and the amount of sleep and rest one gets.

1.2 Stresses at Work
The demands of modern lifestyle and modern organizational setups are inducing stress and acting as a stress factors. Stress at work is not affecting the individual but also affects the organization. Work related stress starts when one cannot cope up with the modern day’s deadlines and long working hours. Stress is a well-known and very common trouble in today's workplace. As per Princeton Survey Research Associates Labor Day survey states, about one-third of workers report high levels of stress. One-quarter of employees sight their jobs as the number one stressor in their lives. Three-quarters of employees suppose the worker has more on-the-job stress than a generation ago [10]. As per Michael Kahn, Work-related stress study finds evidence suggests that stress is the major cause of revenue in organizations. With chronic stress at the workplace, workers will build up psychological and physiological dysfunctions and decreased motivation in excelling in their position [4]. The Kenexa Research Institute released a global survey of almost 30,000 workers which showed that females suffered more workplace stress than their male counterparts [17].

According to the survey, women's stress level were 10% higher for those in supervisory positions, 8% higher in service and production jobs than men, and 6% higher in middle and upper management than men in the same position. Professional stress or job stresses always have a threat to physical health. Work related stress in the life of organized workers, consequently, affects the health of organizations. Work-related stress can be caused by various factors. For example, a person might feel under pressure if the demands of their job (such as hours or responsibilities) are greater than they can comfortably manage. Other sources of work-related stress include conflict with co-workers or bosses, work harassment and threats to job security. What one person may perceive as stressful, however, another may view as challenging.

1.3 Stressor
A stressor is anything that causes the release of stress hormones. There are two broad categories of stressors: Physiological (or physical) stressors and Psychological Stressors.

Physiological (or physical) stressors
These are stressors that put strain on our body (i.e., very cold/hot temperatures, injury, chronic illness or pain).

Psychological Stressors
These are events, situations, individuals, comments or anything we interpret as negative or threatening (i.e., love failure, death, fired from job, etc).

1.4 Work Life Balance
Work life balance is about people having measure of their control over when, where and how they work. Most of the people view the work life balance is what the organization allows for an individual to experience. However, work-life balance is a bi-dimensional approach. The other dimension of work-life balance, which many individuals overlook, relates to
what individuals do for themselves. The success of work life balance is always sustained with achievement along with enjoyment. Achievement and enjoyment at work is a critical part of work-life balance.

Moreover, achievement and enjoyment in the other three quadrants of one’s life (e.g. family, friends and self) is critical as well. Stress occurs in many different circumstances, but is particularly strong when a person’s ability to control the demands of work is threatened. The importance of the balance between personal life and work life is ignored today. The imbalance also has a negative impact in the personal life of working people, some of which have even become social hazards - increasing number of divorces, infertility due to high stress levels, nuclear families etc.

1.5 Work related stressors which affect the work life balance

Stress can strike anyone at any level of the business and recent research (4) shows that work related stress is prevalent and is not restricted to particular sectors, jobs or industries. Job stress is a persistent illness caused by conditions in the workplace that negatively affect an individual’s performance and/or overall well-being of his body and mind. One or more physical and mental illnesses manifests job stress. In some cases, job stress can be disabling. In chronic cases a psychiatric consultation is required to validate the reason and degree of work related stress. In the early stages job stress can boost the body and enhance performance in the workplace, thus the term ‘I perform better under pressure’. However, if this condition is allowed to go continuously and the body is depleted further, the performance ultimately declines and the person’s health degenerates. Due to these health issues and the anxiety caused by the stress at work effectively influence the work life balance. The subject in an organization is switch off if the causality flows through the edges of a cycle and if it again causes C_i, we say that the dynamical system goes round and round. This is true for any node C_i, for i = 1, 2, … n. The equilibrium state for this dynamical system is called the hidden pattern.

Definition 2.1.4: Let C_1,…,C_n be the nodes of an FCM. A = (a_1, a_2,……,a_n) where a_i∈{0, 1}. A is called the instantaneous state vector and it denotes the on-off position of the node at an instant.

\[ a_i = 0 \] if a_i is off and
\[ a_i = 1 \] if a_i is on for i = 1, 2, …, n.

Definition 2.1.5: Let C_1, C_2, …, C_n be a cycle. When C_i is switched on and if the causality flows through the edges of a cycle and if it again causes C_i, we say that the dynamical system goes round and round. This is true for any node C_i, for i = 1, 2, …, n. The equilibrium state for this dynamical system is called the hidden pattern.

II. DEFINITION AND ILLUSTRATION OF COMBINED OVERLAP BLOCK FUZZY COGNITIVE MAPS (COBFCMS)

The FCMs work on the opinion of experts. FCMs model the world as a collection of classes and causal relations between classes. FCMs are fuzzy signed directed graphs with feedback. The directed edge e_ij from causal concept C_i to concept C_j measures how much C_i causes C_j. The edges e_ij take values in the fuzzy causal interval [-1, 1]. e_ij = 0 indicates no causality, e_ij > 0 indicates causal increase, C_j increases as C_i increases (or C_i decreases as C_j decreases), e_ij < 0 indicates causal decrease or negative causality. C_j decreases as C_i increases (or C_i increases as C_j decreases). Simple FCMs have edge values in [-1, 0, 1].

2.1 Definitions

Definition 2.1.1: An FCM is a directed graph with concepts like policies, events etc. as nodes and causalities as edges. It represents causal relationship between concepts.

Definition 2.1.2: FCMs with edge weights or causalities from the set {-1, 0, 1}, are called simple FCMs.

Definition 2.1.3: Consider the nodes or concepts C_1,…,C_n of the FCM. Suppose the directed graph is drawn using edge weight e_ij∈{0, 1, -1}. The matrix E be defined by E = (e_ij) where, e_ij is the weight of the directed edge C_i → C_j is called the adjacency matrix of the FCM, also known as the connection matrix of the FCM.

III. ADAPTATION OF THE PROBLEM

There are many factors contributing to work related stress and all the stress inducing factors (stressors) will lead to work life imbalance. It is known that all the stressors affect the work life balance in some degree. Twelve stress inducing factors are derived from expert’s opinion and to find out which stressor has more influence in provoking the other stress inducing factors and result in work life imbalances. With the help of expert’s opinion the data has been arrived. Since the data is linguistic by nature it makes it very difficult to analyze it with other mathematical tools. Combined Overlap Block FCM is useful in such a way to analyze these linguistic data and make easier to derive the result. With COBFCM, the analysis of work related stressor affects the work life balance directly has been studied in this paper. The following attributes are taken as the nodes of the COBFCM. A = {A_1, A_2, A_3, A_4, A_5, A_6, A_7, A_8,
A9, A10, A11, A12} where A1, A2, A3, A4, A5, A6, A7, A8, A9, A10, A11, A12 are described as

- A1 – Excessive work load
- A2 – Unimportant and meaningless tasks
- A3 – Conflicting job demands
- A4 – Distant or unreachable supervisors
- A5 – Multiple supervisors
- A6 – Lack of individual autonomy and co-operation in decision making
- A7 – Poor performance from co-workers
- A8 – Conflicts and competition among staff
- A9 – Workplace bullying or harassment
- A10 – Long working time
- A11 – Low payment
- A12 – Unreasonable demands from managers or supervisors

The 12 attributes A1, A2, ..., A12 are divided into seven overlapping blocks as

- S1 = {A1, A10, A2, A4}
- S2 = {A3, A6, A4, A7}
- S3 = {A5, A3, A7, A10}
- S4 = {A8, A9, A11, A4}
- S5 = {A12, A10, A1, A7}
- S6 = {A2, A4, A3, A10}
- S7 = {A4, A12, A11, A8}

The related graph for each class is given by the expert’s opinion. The related graph and the relation matrix for the class S1 = {A5, A3, A7, A10} is

The related graph and the relation matrix for the class S2 = {A3, A6, A4, A7} is

The related graph and the relation matrix for the class S3 = {A5, A3, A7, A10} is

The related graph and the relation matrix for the class S4 = {A8, A9, A11, A4} is

The related graph and the relation matrix for the class S5 = {A12, A10, A1, A7} is

The related graph and the relation matrix for the class S6 = {A2, A4, A3, A10} is

The related graph and the relation matrix for the class S7 = {A5, A3, A7, A10} is
The result of the study indicates that the on state of the attribute distant and unreachable supervisors (A₇) leads to the on state of the attributes excessive work load (A₁), conflicting job demands (A₃), lack of individual autonomy and cooperation in decision making (A₆), poor performance from co-workers (A₉) and long working time (A₁₀).

V. CONCLUSION

It is evident that when the supervisor is in distant or unreachable there would be no control over the employees and employees have no place to show their dissatisfaction or negative stress about the job. Since the supervisor is unreachable the excessive work load stressor cannot be reported to the supervisor and hence the employee would feel helpless which itself is a stressor. Conflicting job demands cannot be clarified with the supervisor as the supervisor is in distant or unreachable. Again, since the supervisor is unreachable, individual autonomy in decision making is affected due to the fact that the supervisor is not there to back the employee, this results in poor performance. Long working hours also left unreported to their supervisor for any resolution. Thus distant or unreachable supervisor is major stressor which ultimately resulted in many other work related stressors and thus the work life harmony gets affected.

VI. FUTURE DIRECTION

This paper dealt with the work related stressors which comes under the broad area of psychological stressors, however the study can be further extended into personal stressors such as family issue, health issue, financial problems, etc. Also, the study can be industry specific that is, the study can be done in particular industries like medical, pharma, BPO, IT, Govt.Sector, Banks, etc and find the stress inducing factors which affects the work life harmony. Moreover, the study can be extended to find which gender is more vulnerable to stress and thus get affected by the work life imbalance.

REFERENCES


Here X₃ is the hidden pattern and which is the fixed point.

IV. RESULTS AND DISCUSSIONS

The related matrix E of the combined graph is

\[
\begin{bmatrix}
A_2 & A_3 & A_4 & A_{10} \\
A_2 & 0 & 1 & 0 & 0 \\
A_3 & 0 & 0 & 0 & 0 \\
A_4 & 1 & 1 & 0 & 0 \\
A_{10} & 0 & 0 & 0 & 0 \\
\end{bmatrix}
\]

The related graph and the relation matrix for the class S₇ = {A₄, A₁₂, A₁₁, A₈} is

The combined directed graph is

\[
\begin{align*}
X &= (0 \ 0 \ 0 \ 1 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0) \\
XE &= (1 \ 2 \ 2 \ 0 \ 0 \ 1 \ 1 \ 2 \ 1 \ 0 \ 0 \ 1) \\
&\Rightarrow (1 \ 1 \ 1 \ 0 \ 1 \ 1 \ 1 \ 1 \ 0 \ 0 \ 0 \ 0) = X₁ \\
X₁E &= (1 \ 0 \ 2 \ 0 \ 0 \ 1 \ 4 \ 0 \ 1 \ 9 \ 0 \ 0) \\
&\Rightarrow (1 \ 0 \ 1 \ 0 \ 0 \ 1 \ 1 \ 0 \ 1 \ 1 \ 0 \ 0) = X₂ \\
X₂E &= (3 \ 0 \ 1 \ 0 \ 0 \ 1 \ 3 \ 0 \ 0 \ 5 \ 0 \ 0) \\
&\Rightarrow (1 \ 0 \ 1 \ 0 \ 0 \ 1 \ 1 \ 0 \ 0 \ 0 \ 1 \ 0) = X₃ \\
\end{align*}
\]


