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Assessment of Neural Network and Goal Programming on Cross Cultural Management

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ABSTRACT

For achieving success in a global arena cross cultural training should be provided to employees to settle down between the global business environment and culture as one of the factors contributing to economic success, revenue generation, surplus booking, goodwill enhancement, market fame and many more. More the revenue, more the profit booking leads to rise company's goodwill and builds customers faith as well as provides employee satisfaction which motivates employees to be more productive, more efficient, more energetic, more enthusiastic, and never let employees to get stressed from their work.

AI (ANN) and goal programming is being used a method to find something fruitful to mitigate cross-cultural issues in an organization.

KEYWORDS: *Cross-Cultural Management, Artificial Intelligence, Artificial Neural Network, Goal Programming*

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INTRODUCTION

Cross-cultural management helps in extracting a kind human being in all the employees so that they should feel confident, happy, motivated, inspired, and passionate. The positivity in an atmosphere let people to understand their responsibilities and their loyalty for their organization may leads to the highest peak. "A loyal employee is like a responsible family member", whose honesty can be seen in his work. A positive energy in any organization is directly proportional to the revenue generation and at the same time negative atmosphere of an organization is inversely proportional to the revenue generation.

As per the theory of Mary Parker Follett, who were an American social worker, management consultant, philosopher, and pioneer in the fields of organizational theory and organizational behavior, proposed in her theory that both individual and group behavior directly affects the working culture in an organization.

Just like the marketers do the study on consumer behaviour to understand the need, want and desire of their customers the senior managers have to identify the behaviour of their employees working for their organizations. The Consumer Behaviour is defined as the evaluation of customer's state of mind, their nature of purchasing. Their willingness to pay and many more, likewise management have to evaluate their employee's state of mind whether they are motivated or not, whether they are satisfied by their work or not, whether the work they are performing is beneficial for the organization or not, whether these individuals are productive asset for an organization or not and many more.(Pushkar et al., 2020)

Cross-culture is being represented as an origin or problem, misunderstanding and conflicts among individuals who are working in an organization. It is having certain negative aspects that is why cross-cultural management is required.(Cultural & Management, 2018) CCM is a new and trending research area, due to its large number of issues many researchers are more prone to this area of research. They use various models and theories to extract the fruitful results. Cross-culture acts as an influencer to effect individual daily basis working life. It directly effects the employee's behaviour and effects the harmony in an organization.

Individuals from different cultures when comes together to work in a single organization faces the problem of culture and communication gap. It is being observed that the people from different countries working together faces a lot of problems while representing a strong personality or sense of their individuality or speciality in front of others.

Goal Programming (GP) has been utilized successfully and extensively for the development of a resource allocation decision-making model in business and helps in optimizing the planning and analysis of factors or goals rather than comprehensive resource allocation aspects.

The goal programming (GP) is one of the methods applied to multi-criteria decision making (MCDM). This type of decision making is related to the situation where the decision maker (DM) evaluates specific alternatives such as courses of action, decision variants, options on the basis of more than one criterion. Criteria are usually conflicting.

A neural network isa combined series of various algorithms that ventures to identify relationships in a specified set of data through a process which enacts in a way the human brain works. In this sense, neural networks refer to systems of neurons, either organic or artificial in nature. As they are able to predict like a human brain indicate an individual to perform certain task using their voluntary or involuntary muscles.

LITERATURE REVIEW

Research on cultural management is often stored in the positivist culture, which is clearly illustrated by the work done by Hofstede. However, this provides an incomplete view of the field in which three additional research offerings are offered: interpreter, past, and critical.(Romani et al., 2018)

The Cross-cultural management (CCM) study contains a wide range of disciplines, paradigmatic and methodological. (Barmeyer et al., 2019)

Emotional and social skills are found to represent an effective and coherent, reliable and valid way to assess and develop people in different cultures.(Authors, 2012)

Among all the cultural researches, there are two common types: the first type focuses on the rulers and the rest of the world, focusing on the adjustment and application of any culture; and the second type of examination examines the individuals who work with foreigners in the context of international governance. Moreover, in recent years, emphasis has been shifted from examining the cultural effects of single variables to assessing relationships between the same and different levels of variability.(Dong & Liu, 2010)

Neural networks as another way of investigating the links between different cultural dimensions and theories of justice and demonstrating their ability to measure data relationships with higher accuracy than multiple retrospective analysis.(White, 2015)

The programming program (GP) has become the most widely used method in Operations Research (OR). The GP model and its diversity have been used to solve problems posed by multiple decision-making methods. (Sen & Nandi, 2012)

The application of the GP model adds insight into resource allocation planning activities in any organizations. The proposed model works easily in another staff planning process according to the needs as well as to reduce grievances in the teams which are formed for a specific task.(Praveen Kumar et al., 2018)

RESEARCH GAP

The combination of AI and Advanced Mathematical Model in the field of workforce management to reduce the risk of cross-cultural issues in any organization is an untouched area. Artificial neural network is a build-up network which works like a human brain and able to predict the things that are going to happen around us.

This research is more focused on identifying the factors which are affecting cross-cultural management and suggesting an idea of converting qualitative factors into quantitative ones so as to present a certain numeric data in front of management to take certain measures to motivate or satisfy or to handle conflicts of their workforce.

METHODOLOGY

Goal Programming:

Objective plans are a multi-resource utilization unit, which is also a multi-process decision analysis unit (MCDA). It can be thought of as an extension or integration of an equal system to manage multiple, often contradictory, steps. Each of these steps is given a goal or a target value that will be achieved. Deviations are measured from both targets above and below the target. Unwanted deviations from this target set of values are reduced in the execution function. This can be a vector or a weighted weight depending on the variance of the system used. Since contentment is considered to be a matter for the decision-makers, a satisfying basic philosophy is being considered.

It is being used to analyse three types of analysis:

1. Decide what resources are needed to achieve the goal you want.
2. Find out the level of objectives for the resources available.
3. To provide the most satisfactory solution under the cost of resources and priorities.

Artificial Neural Network:

Like Human Nervous Systems ANN also consist of smaller units called Neurons. Just like biological neurons these artificial neurons takes inputs, process it and generate certain outputs. Biological neuron connections are performed as weights. A good weight indicates a positive connection, and a negative value means a blocking connection. All inputs are weighted and abbreviated. This function is called a straightforward combination. Finally, the activation function controls the output size. For example, the acceptable range of output is between 0 and 1, or it can be −1 and 1.

These artificial networks can be used to create predictive modelling, dynamic controls and applications where they can be trained on the database. Self-study from experience is possible within networks, which can draw conclusions from a set of complex and seemingly unrelated information.

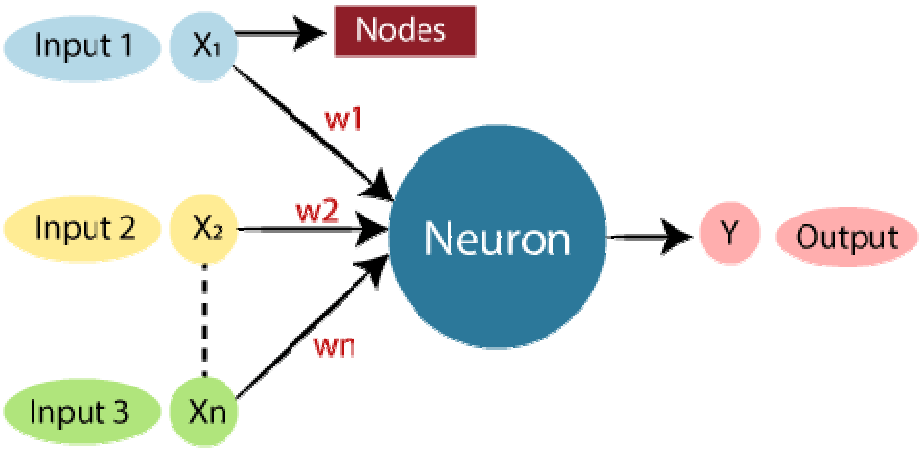

Fig 1: Structure of neuron

BIOLOGICAL NEURAL NETWORK	ARTIFICIAL NEURAL NETWORK
Dendrites	Inputs
Cell Nucleus	Nodes
Synapse	Weights
Axon	Outputs

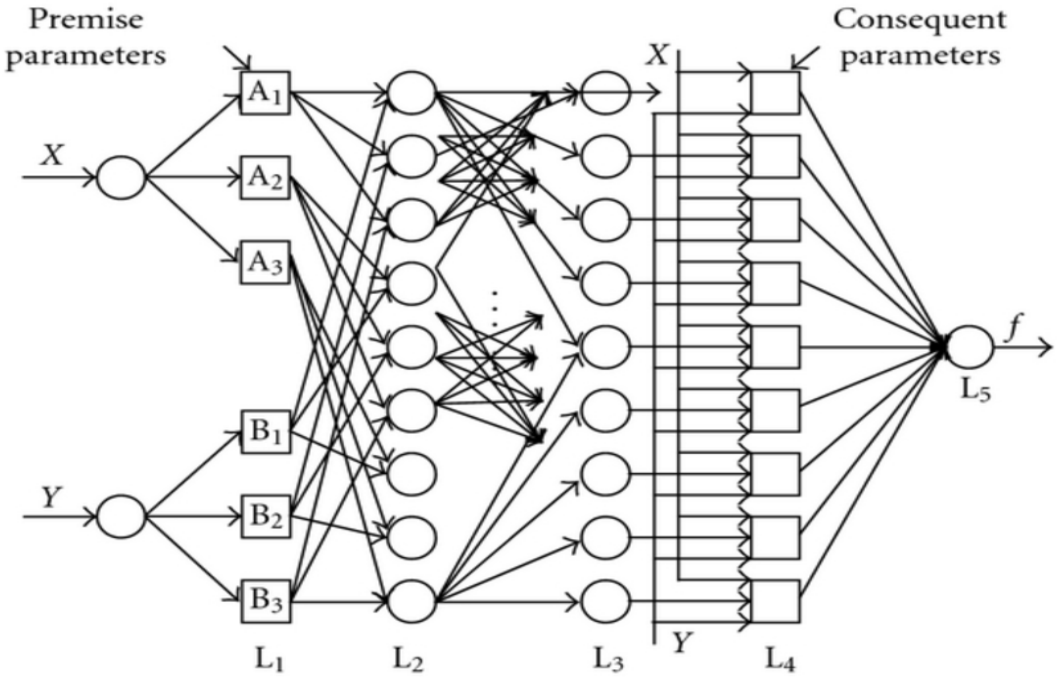

Fig 2: Architecture of Artificial Neural Network

Input layer:
It accepts inputs that are given by a programmer who design this network for a specific purpose.

Hidden layer:
Hidden layer displays between input and output layers that make all calculations to find hidden features and patterns. All the calculations and analysis are being done using the certain function (Activation Function). These features are hidden from users as they are only being known to the programmers.

Output layer:
The input passes through a series of transitions using a hidden layer, eventually leading to a transfer that is transmitted using this layer.

The neural input network takes input and calculates the weighted input of the input and includes the selection. This calculation is expressed in the form of a transfer function.

$$\sum_{i=1}^{n} Wi * Xi + b$$

Determines whether the weighted value is transmitted as a result of the activation function to produce the result. Activation tasks determine whether the node should shoot or not. Only those who are fired make up the output layer. There are different activation functions available that can be used for the type of work we do.

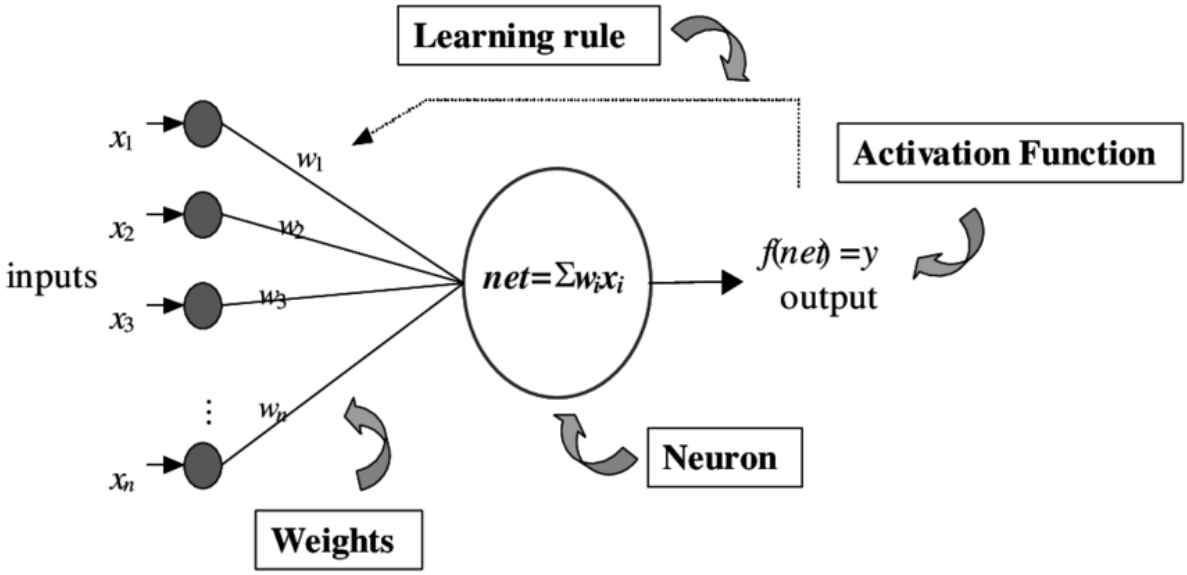

Fig 3: Working of ANN

There are various factors that are affecting cross-cultural management in an organization. These factors are individual or group satisfaction, individual or group motivation, stress management of employees in organization, grievances due to cross-cultural issues, and many more.

We have to list out all the factors that are being raised in an organization due to the communication gap between individuals from different cultures. People from various geographical areas working together to accomplish mission and vision of any organization. Demographical difference is also a reason behind the communication gap as individuals are more comfortable within their peer groups as they hesitate to communicate with their seniors or people who are on higher positions.

Gender gap is also a factor which is affecting cross-cultural management in any organization. As there is a myth that women are not capable to handle positions that are on higher management level properly. This is not true but somehowwomen are more emotional than men while taking any decisions. Men are more practical than women.

By using goal programming technique, we can identify the goals for which we have to generate a single activation function which works in a hidden layer of ANN.

Certain goals that are being identified in any organization of any field are:

1. Maximizing Revenue: Minimizing cross-cultural issues
2. Maximizing Profit Generation: Minimizing cross-cultural issues
3. Maximizing Employee Satisfaction: Minimizing cross-cultural issues
4. Maximizing Employee Motivation: Minimizing cross-cultural issues
5. Maximizing Goodwill of an Organization: Minimizing cross-cultural issues

Equation:

Min. (Cross-cultural issues) =>

$$\{Max.(Revenue, Profit\ Generation, \sum Employee\ satisfaction, Employee\ Motivation, Goodwill\ of\ an\ Organization)\}$$

Since all these factors are qualitative in nature and can't be measured in numbers. We have to identify certain quantitative factors which directly or indirectly effect these factors so as to build up further equations to establish relationship between these qualitative factors into quantitative ones.

Then the build-up equation is being exaggerated and process into artificial neural network and gives the output which helps in predicting how certain measures can be taken to avoid cross-cultural risks in an organization.

CONCLUSION

In this research paper we have found that being a part of science and advanced mathematics AI and Goal Programming plays an important role in Human Resource Management as well. It helps in developing relationship between cross-cultural issues and the factors affecting them. We have identified those factors which are being maximized by minimizing cross-cultural issues in an organization and sum-up these factors to evaluate it in activation function to process output through output layer of Artificial Neural Network.

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