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ZINCOXIDE PHOTO ELECTRO CHEMICAL CELL IN THE PRESENCE OF N-METHYL FORMAMIDE

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ABSTRACT

ZINCOXIDE(ZnO) is an n-type semiconductor which may be used as photo sensitive electrode and photo catalyst in the presence of organic substrates. ZnO photoelectrochemical (PEC) cell is constructed in the presence of N-methyl formamide (NMF). In oxygen atmosphere, ZnO electrode produces cathodic photocurrent which is attributed to the reduction of O_2 and anodic photocurrent is due to oxidation of NMF in the presence of N_2. A suitable mechanism is proposed for the electrode reactions.

Keywords: PEC CELL, ZnO, NMF, PHOTOVOLTAGE, PHOTOCURRENT

INTRODUCTION

The annual flux of solar energy falling on the earth is about 1.2 x 10^{21} Kcal.[1]. A large part of this (33%) is lost due to reflection by the atmosphere and the earth's surface. The rest of the energy is absorbed by the atmosphere (17%), oceans and seas (33%) and land (15%). Of the energy absorbed, only about 6 x 10^{7} Kcal./year (7 x 10^{-4}%) is converted into chemical energy via photosynthesis in plants and by micro organisms. However, only a small portion of this converted energy is utilized by mankind.

For the efficient utilization of solar energy that is available it is necessary to develop suitable methods for its storage. The photochemical conversion of solar energy into either electricity or chemical fuel is one of the most attractive pathways. The first observation of photoeffect at a metal or semiconductor electrolyte junction was reported by Becqurel [2]. A practical use for energy storage in the form of production of hydrogen from water was realized by Fujishima and Honda [3]. Since then extensive investigations have been carried out all over the world in the area of photochemical synthesis of energy rich compounds and photochemical decomposition of water.

Systems without semiconductors are found to be less efficient due to poor separation of products and reactants and occurrence of thermal back reactions between the products [4]. In the presence of semiconductors, the absorption of reactants on semiconductors and participation of electronic states of the semiconductor makes the system more efficient.

Usually the reactions in particulate systems and in PEC cells are compared on the basis of the products formed. In most of the cases the products are the same for both the systems and each particle of the semiconductor in the particulate system is treated as a micro PEC cell.

The study of PEC cells gained momentum with the first report of Fujishima and Honda [3] relating to the photo-electrochemical decomposition of water at an n-Tio_2 electrode illuminated by ultraviolet light. In 1975 Gerischer[5] showed the use of PEC cells for conversion of solar energy to electricity using reversible redox systems as the electrolytes.

An understanding of the process occurring inside the semiconductor on absorption of light and the charge transfer reactions that take place at the surface of the semiconductor in contact with the electrolyte is necessary for devising PEC cells for energy conversion.
Using semi conductor materials like ZnO, TiO_2, ZnO in the construction of PEC Cells received considerable attention. Any semi conductor to be effective in a PEC cell must be chemically inert and make use of solar energy in the visible region. **ZnO** is an n-type semi conductor with a band gap of 2.7 eV. This corresponds to utilization of 11.8% solar energy. **ZnO** is reported (1) as a stable semi conductor for electrolysis of water in the presence

of light. Photo catalytic activity of Z**n**O is also reported (2).

In the present study **ZnO** is used as a photo electrode in a PEC cell consisting of NMF Aqueous solution as electrolyte. Photo voltages and photo currents are measured. **ZnO** in the powder state is used as photo catalyst and the products are identified.

EXPERIMENTAL

PEC cell is constructed using polycrystalline **ZnO** paste. A thin layer of **ZnO** is deposited on a platinum foil and used as photo electrode. A platinum foil is used as counter electrode. A 1500W halogen lamp is used as light source. Electrolyte solution is a mixture of 0.1M KCl and 0.1M NMF.

ZnO,Pt/0.1 M NMF//0.1 M KCl/Pt
0.1 M KCl

here diagram to be inserted

RESULTS AND DISCUSSION

The sign of the open circuit voltage is found to depend upon gaseous atmosphere present at the electrode. In the absence of light the voltages are more positive in N_2 than in O_2. PEC cell produces a negative photo voltage and cathodic current in the presence of visible light and O_2. In the presence of N_2 a positive voltage is developed and anodic current is noted (table.1). If N_2 atmosphere is not maintained properly, the adsorbed O_2 on **ZnO** electrode surface initially produces cathodic current and then anodic current as shown in (Fig.1 & 2).

Table 1-Effect Of Gaseoius Atmosphere On Photo Voltage And Photo Current
Electrolyte: 0.1 M NMF in 0.1 M KCl (40ml)
Area of the electrode: 3 cm^2
Light source: 1000 watt halogen lamp

Gaseous atmosphere at		Open circuit photo-Voltage (mV)	Short circuit photo current (µA)	Nature of the photo-current
ZNO Electrode	Counter Electrode			
O_2	O_2	-150	3.1	Cathodic
O_2	N_2	-140	2.9	Cathodic
N_2	O_2	+45	0.5	Anodic
N_2	N_2	+43	1.0	Anodic

Photo voltage in O_2 reaches a limiting value within 15 minutes. It takes longer times, 150 minutes in N_2. When the light is switched off, the photo voltage of the cell in O_2 decays fast while in N_2 the decay is slow (Fig. 1).

The cathodic photocurrent in O_2 increases steeply on illumination. It reaches a maximum value, then decreases fast and attain a constant value (Fig.2) when the light is switched off, rapid decay of photo current is observed in both the atmospheres.

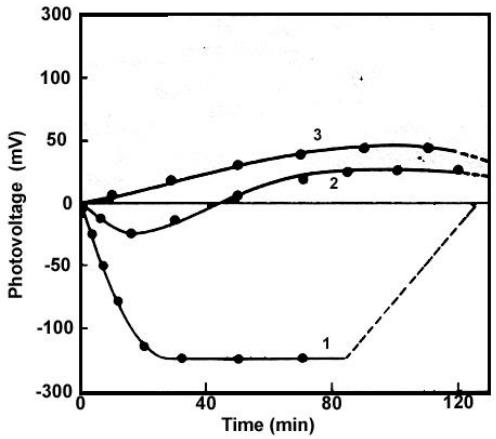


Fig.1-Variation of Photovoltage with time
1. Oxygen Atmosphere
2. Nitrogen Atmosphere (Bubbled for 60 minutes)
3. Nitrogen Atmosphere (Bubbled for 120 Minutes)
4. …….Light off

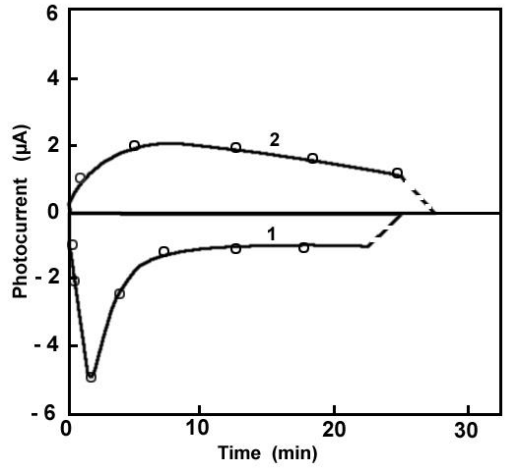


Fig2- Variation of Photocurrent with time
1. Oxygen Atmosphere
2. Nitrogen Atmosphere
3. …….Light off

Effect of intensity of light on photo voltage in O_2 atmosphere and 0.1M KCl and 0.1M N-Methyl formamide is studied. The photo voltage increases with light intensity and reaches a limiting value. Photo voltage is maximum around 360 nm, which corresponds to the band gap of Z**n**O (3.2 eV).

The plot of photovoltage verses log of light intensity is linear (Fig 3) which shows that **ZnO** behaves as a semiconductor (3).The generation of anodic photo current is due to oxidation reaction. In the present case cathodic photocurrent is observed only in the presence of oxygen. When O_2 is replaced by N_2 gas only anodic photo current is generated. Hence, cathodic photo current is due to reduction of O_2 to O_2^{--} Many Authors (8-10) observed similar effects on semi conductors. The super oxide Ion O_2^- is a good nucleophile and can react with carboxyl compounds (9). The O_2 reacts with N-methyl formamide to give CO_2 and $CH_3.NH_2$. CO_2 is identified at the electrode. However, CO_2 is not identified in the presence of N_2.

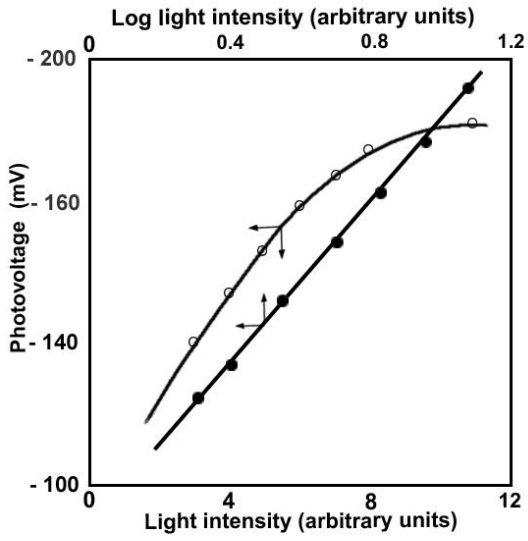


Fig3-Effect of intensity of light on photovoltage in oxygen atmosphere

Based on the experimental observations and the product analysis, a mechanism is proposed as given below. In reaction (2) the excited electrons in the conduction band flow to the surface of the electrode to react with adsorbed O_2 to give O_2^- and is responsible for the generation of cathodic photocurrent. The initial steep increase in photocurrent (Fig.3) is due to the availability of surface oxygen to react with the electrons as soon as illumination is started. The subsequent decrease may be due to poor electron hole separation and the oxidation of O_2^{--} radical by valence band holes (reaction 3). Detection of H_2O_2 provides additional evidence for the formation of O_2^{--} (12).

The other products, CO_2 and $CH_3.NH_2$ are formed only in the presence of oxygen and under illumination. Hence the O_2^{--} is expected to react with DMF to give CO_2 and $CH_3.NH_2$ as shown. Protonation of NMF (reaction 6) is well known in acidic medium and this facilitates O_2^{--} attack on the carbonyl carbon of the NMF.

The anodic nature of photocurrent in nitrogen

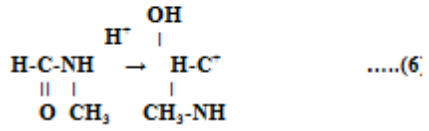
$$ZnO \xrightarrow{h\nu} ZnO^{(+)} + e^- \quad \text{....(1)}$$

$$e^- + O_{2\,(ads)} \rightarrow O_2^-{}_{(ads)} \quad \text{... (2)}$$

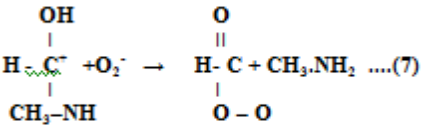
$$O_2^-{}_{(ads)} + ZnO^{(+)} \rightarrow O_2 + ZnO \quad \text{...(3)}$$

$$O_2^-{}_{(ads)} + H^+_{(ads)} \rightarrow HO_2^{\cdot} \quad \text{...(4)}$$

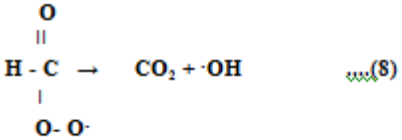
$$2HO_2^{\cdot}{}_{(ads)} \rightarrow H_2O_2 + O_2 \quad \text{...(5)}$$



.....(6)



....(7)



....(8)

$$2 \cdot OH \rightarrow H_2O_2 \quad \text{....(9)}$$

$$ZnO^- + OH^- \rightarrow ZnO + \cdot OH \quad \text{..... (10)}$$

When the electrode is in nitrogen atmosphere, the electrons that are excited to the conduction band flow into the bulk of the semiconductor to produce anodic photocurrent. The photocurrent increases initially, attaining a stable value and then decreases slowly. Initially there is a greater amount of band bending which efficiently separates photoproduced holes and electrons. As the illumination progresses, the separation becomes less efficient due to decrease in band bending, resulting in recombination of electrons and holes. Hence the anodic photocurrent after reaching a maximum value starts decreasing.

It has not been possible to completely eliminate either oxidation or reduction at the electrode in a particular gaseous atmosphere. Both reactions can take place simultaneously and whichever dominates decides the sign of the photovoltage. In oxygen, reduction takes place by conduction band electrons along with the oxidation of NMF by valence band holes during illumination (14). But the rate of reaction with holes is very slow while the reduction of oxygen is faster. Hence negative photovoltage dominates in this case. In nitrogen the presence of minute amounts of oxygen, like surface oxygen leads to an initial generation of negative photovoltage which gradually becomes positive. Only prolonged purging of the electrolyte with nitrogen completely eliminates negative photovoltage (Fig.2).

CONCLUSION

Development of photoelectrochemical cells less sensitive to air and not requiring hermetic seals will decrease the fabrication costs as well as the technological problems. One can consider the Z**n**O based photoelectrochemical cell which is not sensitive to air. But the efficiency of such a cell is very low. Investigations are in progress to improve the cell efficiency and electrode stability.

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Time Dependent Assignment problem and its extensions for construction project scheduling

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ABSTRACT:

The time dependent assignment problem consists of allocating renewable resources (construction equipment, crews, or contractors, machines , jobs and persons) of limited availability to a set of activities, this perform a subtask is limited to specific intervals in time. The classical model for this problem objective is to minimize the total time or cost of completing all activities with the assumption that each activity is assigned to one particular resource at perticular period. A time-dependent task is a task requiring multiple renewable resources to perform separate subtasks simultaneously or within some predetermined margin where resource availability to perform a subtask. This paper systematizes and describes extensions of these assumptions, considering the effects of task sequence: parallel, serial and hybrid (modeled by means of network methods). This study proposes algorithms for the solution of presented models, which can be used in construction project scheduling.

KEYWORDS: assignment problem, project scheduling, mathematical modeling, renewable resources, bottleneck assignment problem

I. INTRODUCTION

The time dependent Assignment problems (selection and allocation of resources to the jobs or machines at perticular time period) are one of the primary task in construction process synchronization at particualr times. In its classical formulation *n* teams (i.e crews, sets of construction plant, contractors, and samples) are assigned to *n* activities at particualr r times, in order to minimize the total time or cost of completing all of them. Arrangement of these activities depends on technological and organizational requirements. These requirements concurrently affect the allocation constraints, such as assigning only one job to each machine at particualr periods. With respect to technological constraints, options for conducting construction processes in parallel, in series, or in a hybrid way may exist. Parallel processing consists of the simultaneous execution of activities by different resources in separate building units (work zones) at particualr times. The greatest advantage of this technique is the shortest project time span *T* – when compared with other approaches. The drawbacks of the parallel technique are: the lack of teams' work continuity and unleveled daily demand for building materials or plant as per duration.

Serial processing consists of performing a sequence of processes in one work zone in the seasonally. The advantage of this method is the lowest maximum level of daily employment of renewable resources and daily usage for building materials. Each activity may be realized by a different crew, but the total duration is incommensurately long. Another disadvantage,

similar to the parallel technique is discontinuity of the team's work and unleveled daily consumption of resources. Hybrid processing is a combination the two previous approaches seasonally. The precedence constraints, modeled by means of network techniques, enable serial processing of some activities (on the same network path) and, simultaneously, concurrent processing of other jobs on parallel paths. The two optimization approaches are used for resource management in project networks: allocation of limited resources (in order to minimize the project makespan) and leveling resource requirements profile (in order to improve economicefficiency). This study considers different processing options for assignment problem

formulation. It has been assumed that an activity requires one resource type for its execution (crew, contractor), and the resource can perform one activity at a time with particular time periods seasonally. In the case of parallel processing, each activity has to be carried out by a different crew. With serial processing, each activity can, but does not have to be conducted by a different crew. Thus, in the case of hybrid processing,

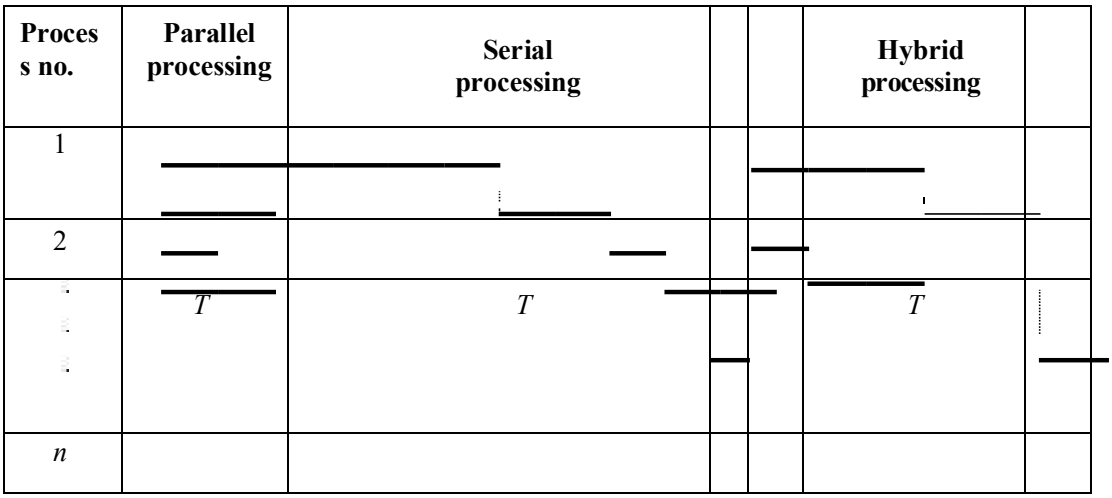

Fig. 1. Comparisons of different processing options in processes scheduling

parallel activities have to be entrusted to different crews, and activities scheduled in sequence can but do not have to be carried out by different crews. A discrete time/cost/resource function implies the representation of an activity in different modes of operation. For each activity *i* (construction process), a set of modes of execution is defined. Each mode, is described by the following parameters: $t_{ij} \in N$ – duration of the activity *i* realized by crew *j* and $k_{ij} \in R$ – cost of the activity *i* realized by crew+ *Jat particular time period k*. The problem consists of choosing the optimal process modes in order to minimize the project duration or cost. Binary linear programs are developed to model the assignment problem for different processing options and recommended approach solutions are presented.

II FORMULATION

1 Assignment problem formulation for parallel processing

The classical assignment problem was formulated in 1952 by D.F. Votaw and A. Orden
[1] as a type of transportation problem. Present extended study in on time dependent assignment problem. The mathematical model of the time dependent assignment problem for parallel processing can be described by an objective function minimizing the total cost of realizing processes at particualr times
:

$$\text{MinZ=Min}\left(\sum_{j=1}^{m}\sum_{i=1}^{n}\sum_{k=1}^{s} k_{ijk}x_{ijk}\right)$$

and the following constraints:

$$\sum_{i=1}^{n} x_{ijk} = 1, \quad j = 1, 2, ..., n, \text{ k=1,2…r} \qquad (2)$$

$$\sum_{j=1}^{n} x_{ijk} = 1, i = 1, 2, ..., n, \text{ k=1,2…r} \qquad (3)$$

$x_{ijk} \in \{0,1\}, i = 1, 2, ..., n, j = 1, 2, ..., n$, k=1,2…r
where:

x_{ijk} – a binary variable for modeling a decision of selecting processes' modes; the variable assumes the value of 1 if the activity *i* is to be executed by the resource (crew) *j*, and equals 0 in the other case. According to equations (2) and (3), considering equal numbers of crews and activities, each crew may be assigned only to one process and each process may be realized by only one crew at the particular time period.

H.W. Kuhn [2] in 1955 created the Hungarian method – exact algorithm for solving the model. He combined the ideas of two Hungarian mathematicians: D. König [3] and J. Egerváry [4]. The method finds an optimal assignment for a given square cost matrix, and consist of five steps [2, 5–7]: with the considered time dependent periods.

Step 1 – Subtract the smallest entry in each row from all the entries of its row.

Step 2 – Subtract the smallest entry in each column from all the entries of its column.

Step 3 – Construct a minimal number of lines, which covers all the zero entries of the cost matrix with k_{ij}.

Step 4 – If number of covering lines is *n*, then it is complete. Otherwise, proceed to Step 5.

Step 5 – Determine the smallest, uncovered entry and subtract it from uncovered rows, and then add this entry to each covered column. Repeat Step 3.

The bottleneck assignment problem is one of the extensions of the classical formulation. It consist of the minimization of the project makespan – maximal duration of processes realized in parallel (each demanding a different crew):

$$\text{Min z: } z = \max \sum_{j=1}^{m} \sum_{i=1}^{n} \sum_{k=1}^{s} k_{ijk} x_{ijk} \quad (5)$$

subject to the same constraints and definitions as in the classic time dependent assignment problem. In 1959 O. Gross [8] created an algorithm which is used for solving this kind problem. It may be described as follows: time dependent assignments

Step 1 – Begin with any of feasible solution, e.g. $x_{ii} = 1$, I = 1, 2, …, n, set of chosen entries – $B = \{t_{ij} : x_{ij} = 1\}$.

Step 2 – Compute $V = \max\{t_{ij} : x_{ij} = 1\}$.

Step 3 – Locate a cycle, which begins and ends at V as follows:

Step 3a – from V go to entry in its column with cost less than V,

Step 4 – Reverse the assignments along entries, which take part in previous steps. Let $x'_{ij} = 1 - x_{ij}$ for participating entries in Step 2. Proceed to Step 2.

2.Assignment problem formulation for serial processing

After completing each serial process, the renewable resources become available again and may be assigned to succeeding activities with the time periods. Therefore, the constraint (2) in the classical formulation doesn't hold in

this case. For each process, the whole set of crews is considered as the feasible solution space – in the problem of minimizing project duration as well as cost, aappropriate modes should be selected with the shortest duration for each process or with minimal cost, respectively.

Assuming that the processes sequence will be repeated continuously in d identical work zones (units), the objective function of minimizing project duration should be modified as follows:

$$\text{Min } z : z = (d-1)\max\{t_{ijk} \cdot x_{ijk}\} + \sum_{j=1}^{m} \sum_{i=1}^{n} \sum_{k=1}^{s} t_{ijk} x_{ijk}$$

The mathematical model (converted to linear form) with binary variables for many practical instances may be solved using any commercial optimization software.

3.Assignment problem formulation for hybrid processing

A construction project can be modeled as an activity–on–node network. Precedence relations between activities are modeled by a graph $G = <V, E>$, directed and acyclic, with

a single initial node and a single final node, where $V = \{1, 2, \ldots, n\}$ is a set of activities with dependent time periods, the edges (or arcs) $E \subset V \times V$ represent precedence relations between activities. R is the set of resources – crews or contractors – available to the project. Variables s_i, $\forall i \in V$, stand for activities' start times

. Resources can be assigned to a number of processes, but not at the same time. Therefore, a set of processes' pairs $J \; V \times V$ can be defined, which can potentially be executed in parallel ($(u, v) \in J \Leftrightarrow u < v$ and activities u and v do not lie on the same path of the project network).

In the case that the resource j ($x_{ij} = 1 \wedge x_{vj} = 1$) is assigned to a pair of processes $(u, v) \in J$, these

Processes cannot run at the same time,

but have to be completed in sequence. The sequence is modeled by means of binary variables: $y_{uv} \in \{0, 1)$, defined for $\forall (u, v) \in J$. The variable y_{uv} equals 1 if the activity u is to be completed before activity v, and it equals 0 in the other case.

The decision making process is aimed at selecting options of resource assignment and scheduling them in such a way that project duration is minimal. To solve the problem, a mixed integer (binary) linear program is developed to model the construction project scheduling problem. The mathematical model used for this problem is described as follows:

$$\min T: T = s_n + D_n \qquad (7)$$

$$D_i = \sum_{j\in R}\sum_{k\in R} t_{ijk}\cdot x_{ijk},\ \forall i\in V \qquad (8)$$

$$\sum_{j\in R}\sum_{k\in R} x_{ijk} = 1,\ \forall i\in V \qquad (9)$$

$$s_1 = 0 \qquad (10)$$

$$s_i + D_i \le s_l,\ \forall (i,l)\in E \qquad (11)$$

$$s_u + D_u \le s_v + M\cdot(1-y_{uv}) + M\left(2 - x_{uj} - x_{vj}\right),\ \forall (u,v)\in J, \forall j\in R \qquad (12)$$

$$s_v + D_v \le s_u + M\cdot y_{uv} + M\cdot\left(2 - x_{uj} - x_{vj}\right),\ \forall (u,v)\in J, \forall j\in R \qquad (13)$$

$$s_i \ge 0,\ \forall i\in V \qquad (14)$$

$$x_{ijk}\in\{0,1\}, \forall i\in V, \forall j\in R\ \forall k\in R \qquad (15)$$

$$y_{uv}\in\{0,1\}, \forall (u,v)\in J \qquad (16)$$

The objective function (7) minimizes total project duration. Equation (8) determines duration D_i of a activity i – it has been introduced as an auxiliary formula to simplify the formulas (7) and (11)–(13). According to condition (9), each activity can be executed in only one way – as selected from available options. Execution of the first activity of the project (i.e. a activity that has no predecessors) starts at the moment of 0 (10). Condition (11) defines the successors' start dates as "not earlier than their predecessors have been completed with time dependent condition". Formulas (12) and (13) are introduced to define process start times $(u, v) \in J$. If these processes are not to be executed by the same resource j, ($x_{ij} = 0 \vee x_{vj} = 0$), both of these conditions are automatically met (M is an arbitrarily assumed, sufficiently large constant), and the processes may run concurrently. If the same resource j is assigned to them ($x_{uj} = 1 \wedge x_{vj} = 1$), and if the variable y_{uv} assumes the value of 1, then (in accordance with condition (12)), process v can only start after process u has been completed; in this case, condition (13) is automatically fulfilled. If the variable y_{uv} equals 0, then process v must be completed before, u has been started – according to condition (13) and condition (12) is met automaticall

The problem of project cost minimization is trivial and in the optimal solution the crews with the lowest cost for each process are assigned to realize it. Because the project duration for this assignment may be unacceptably long, the objective could be modified as follows

$$\text{Min k: } k = \sum_{j=1}^{m}\sum_{i=1}^{n}\sum_{k=1}^{s} k_{ijk}x_{ijk} \qquad (17)$$

and the following constraint needs to be added to assure not exceeding the deadline T_d

$$s_n + D_n \le T_d \qquad (18)$$

III. EXAMPLE

Durations (in days) and costs (in monetary units) for completing a particular processes by particular crews in an example project is presented in matrices **T** and **K** respectively.

$$\mathbf{T} = \begin{bmatrix} 9 & 7 & 6 & 5 & 4 \\ 6 & 5 & 8 & 6 & 4 \\ 3 & 5 & 2 & 5 & 5 \\ 4 & 4 & 4 & 3 & 4 \\ 6 & 5 & 8 & 7 & 6 \end{bmatrix},$$

$$\mathbf{X}_{\mathrm{I}}^{1} = \begin{bmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 1 & 0 \end{bmatrix}$$

The hybrid precedence relations of the processes is settled according to the technological constraints and shown in Fig. 2.

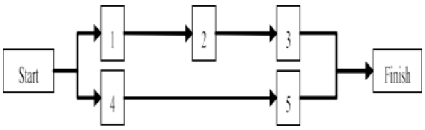

Fig. 2.

There are two optimal solutions of the assignment problem for parallel processes (with minimal project cost of 19 monetary units) obtained using the Hungarian algorithm:

$$\mathbf{X}_{\mathrm{I}}^{1} = \begin{bmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 \\ 0 & 1 & 0 & 1 & 0 \end{bmatrix},$$

and

$$\mathbf{X}_{\mathrm{II}}^{1} = \begin{bmatrix} 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \end{bmatrix}.$$

The Hungarian algorithm prompts that there are three different optimal solutions obtained for the original assignment problem with minimal sum of processes' durations (20 days):

$$\mathbf{X}^{2} = \begin{bmatrix} 0 & 0 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 & 0 \end{bmatrix}, \quad \mathbf{X}^{2} = \begin{bmatrix} 0 & 0 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 & 0 \end{bmatrix}, \quad \mathbf{X}^{2} = \begin{bmatrix} 0 & 0 & 0 & 0 & 1 \\ 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 & 0 \end{bmatrix}$$

The solution ^{1} is also obtained by means of the algorithm by Gross. The minimal.duration for the bottleneck assignment problem is 5 days. Because the solutions for both the bottleneck and the original assignment problems are the same, so this is also the optimal crew assignment for the sequence of processes repeated in different units (regardless of the units number).

The optimal solution for crew assignment processes with hybrid precedence constraints are as follows:

The minimal project duration for a given network is 10 days. Solution of the mathematical model (7)–(16) based on the above input values was found by means of LINGO 12.0 Optimization Modelling Software by Lingo Systems Inc.

IV. CONCLUSION

Scheduling with the allocation of constrained resources, particularly for skilled labor, is a major challenge for almost all construction projects with time dependent constraint. Most existing techniques for project scheduling consider a single–skilled resource strategy where each worker or crew is assumed to be of one particular trade. This strategy may lead to inefficiencies in labor utilization, which can also be reflected in increased project durations and unnecessary costs. In practice each construction contractor or crew can possess several skills at different proficiency levels,
i.e. they are able to perform more than one type of work (construction process), each at specified times and costs. The assumption that each worker may possess multiple skills which could allow them to participate in any activity that fits one of their skills, can improve project efficiency in terms of

project cost and duration with considered time durations.

The resources assignment models presented in the paper can help managers in determining a strategy for crew or bids selection.

For the case of parallel processing there are exact algorithms available for solving assignment problems with low computational effort. For hybrid processing options, the problems analyzed in this paper can be considered as an extension of the Resource– Constrained Project Scheduling Problem (RCPSP) which is NP–hard. Exact algorithms may be not efficient to solve complex practical problems with considered time dependent constraint , therefore developing heuristic solving procedures is recommended for further research.

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SOME RESULTS ON CLOSED INTERVAL-VALUED M-POLAR FUZZY GRAPHS

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Abstract:

In this paper, we introduced a new concept of closed interval-valued m-polar fuzzy (CIVmPF) graph and investigated some of its properties. Also defined degree and total degree of an edge and obtained equivalence condition for edge regular CIVmPF graph and totally edge regular CIVmPF graphs.

Keywords: CIVmPF graph, Edge degree, Total edge degree, Complete graph.

Section 1: Introduction

In non-deterministic real life situations free body diagrams are using as a set of nodes connected by lines representing pairs are good problem solving tools. In this connection graphs developed using discrete parameters to solve problems related to vague and uncertain real life situations are demonstrated by Zadeh [28] in 1965. Problems related to networks that demand intuitive data analysis technique are solved by interval valued fuzzy sets introduced by Zadeh [29]. The limitations of traditional model were overcome by the introduction of bipolar fuzzy concept in 1994 by Zhang [30, 31]. This was further improved by Chen et al. [6] to m-polar fuzzy set followed by Kaufmann [13] fuzzy graph. Rosenfeld [21], Bhutani et al. [4, 5], Samanta and Pal [22], Sunitha and Mathew [25] extended the fuzzy graph theory to accommodate various complex problems in planar graphs. Isomorphism and complement of bipolar fuzzy graph and interval-valued fuzzy graphs were prefaced by Talebi and Rashmanlou et al. [26, 27]. While Rashmanlou et al. [19, 20] studied the categorical properties of bipolar fuzzy graphs. Ghorai and Pal [7-12] introduced single m-values to m-polar fuzzy graphs followed by extensive work on planarity in vague graphs. Self centered interval valued fuzzy graphs and interval valued fuzzy line graphs were developed by Akram et al. [1-3]. Intutionistic fuzzy tolerance graph theory

models were introduced by Sahoo and Pal [23, 24] to understand tolerance, product and degree of intutionistic fuzzy graph. Genus value of m-polar fuzzy graphs was discussed by Mandal et al. [16]. Ramprasad et al. [17, 18] studied the properties of product m-polar fuzzy line graph, product m-polar fuzzy intersection graph and h-morphism between two m-polar fuzzy graphs. Mordeson and Nair [14, 15] studied fuzzy hypergraphs and some operations on it.

This paper attempts to develop theory to analyze parameters combining concepts from m-polar fuzzy graphs and interval valued fuzzy graphs as a unique effort. The resultant graph is turned CIVmPF graph and studied properties on it. CIVmPF graph theories have several applications in different fields such as image capturing, image segmentation, networking, data mining, planning (air lines connectivity, landscape connectivity etc.), scheduling and clustering.

Section 2: Preliminaries

An interval number, $\bar{N}$, is defined as an interval $\left[N_S, N_H\right]$, where $0 \le N_S \le N_H \le 1$. The set of all interval in between 0 and 1 is denoted by $T[0,1]$. The interval $[N,N]$ is identified with the numbers $N \in [0,1]$. For interval number $\bar{N}_j = \left[N_{S_j}, N_{H_j}\right] \in T[0,1]$ and $j = 1, 2, \cdots$.

We define

$\inf \bar{N} = \left[\wedge_{j\in Z^+} N_{S_j}, \wedge_{j\in Z^+} N_{H_j}\right]$ and

$\sup \bar{N} = \left[\vee_{j\in Z^+} N_{S_j}, \vee_{j\in Z^+} N_{H_j}\right]$, where Z^+ is the set of positive integers. We define

i) $\bar{N}_1 \le \bar{N}_2 \Leftrightarrow N_{S_1} \le N_{S_2}$ and $N_{H_1} \le N_{H_2}$.

ii) $\bar{N}_1 = \bar{N}_2 \Leftrightarrow N_{S_1} = N_{S_2}$ and $N_{H_1} = N_{H_2}$.

iii) $\bar{N}_1 < \bar{N}_2 \Leftrightarrow \bar{N}_1 \le \bar{N}_2$ and $\bar{N}_1 \ne \bar{N}_2$.

iv) $m\bar{N} = \left[mN_S, mN_H\right]$, where $0 \le m \le 1$.

Definition 2.1. A *closed interval-valued m-polar fuzzy set* Q in V is defined by

$$Q = \left\{ \begin{matrix} \left(q, \left[N_{S_1(q)}, N_{H_1(q)}\right]\right), \left(q, \left[N_{S_2(q)}, N_{H_2(q)}\right]\right), \\ \cdots, \left(q, \left[N_{S_m(q)}, N_{H_m(q)}\right]\right) \end{matrix} \right\},$$

where $N_{S_j(q)}$ and $N_{H_j(q)}$ are a lower and upper limit of the j^{th} fuzzy interval $j = 1, 2, \cdots m$.

Definition 2.2. A *closed interval-valued m-polar fuzzy relation* T on a set E is defined as follows: for $j = 1, 2, \cdots m$

$$NE_{S_j(\alpha, \beta)} \leq N_{S_j(\alpha)} \wedge N_{S_j(\beta)}$$

$$NE_{H_j(\alpha, \beta)} \leq N_{H_j(\alpha)} \wedge N_{H_j(\beta)}$$

Let $G = (V, E)$ be a graph where V (non-empty set) is called vertex set and E (empty or non-empty set) is called edge set. If no edge incident with a vertex, then the vertex is said to be isolated vertex, otherwise, it is said to be non-isolated vertex.

Definition 2.3. An *m-polar fuzzy graph* $G = (V, W, F)$ with underlying crisp graph $G^* = (V, E)$

Where $W : V \to [0, 1]^m$ is an m-polar fuzzy set in V and $F : V \times V \to [0, 1]^m$ is an m-polar fuzzy set in $V \times V$ such that for each $j = 1, 2, \cdots m$,

$p_j \circ F(\alpha, \beta) \leq \inf \{ p_j \circ W(\alpha), p_j \circ W(\beta) \}$ for all $(\alpha, \beta) \in V \times V$ and $F(\alpha, \beta) = 0$ for all $(\alpha, \beta) \in (V \times V - E)$, ($O = \langle 0, 0, \cdots, 0 \rangle$ is the least element in $[0, 1]^m$). $p_j \circ W(\alpha)$ and $p_j \circ F(\alpha, \beta)$ represents the j^{th} component of the degree of membership value of a vertex 'α' and '(α, β)' edge of m-polar fuzzy graph.

Section 3: Regularity on CIVmPF graph

In m-polar fuzzy graph, each vertices or edges have m components and those components are fixed. But, these components may be interval. Using this idea, CIVmPF graph has been introduced in this section.

Definition 3.1. A *CIVmPF graph* $G = (V, W, F)$ with underlying crisp graph $G^* = (V, E)$ where $W : V \to T[0, 1]^m$ is aCIVmPF set in V where $p_j \circ W(\alpha) = \left[N_{S_j(\alpha)}, N_{H_j(\alpha)} \right]$ for each $j = 1, 2, \cdots m$ and $F : V \times V \to T[0, 1]^m$ is a closed interval-valued m-polar fuzzy relation in $V \times V$, where $p_j \circ F(\alpha, \beta) = \left[NE_{S_j(\alpha,\beta)}, NE_{H_j(\alpha,\beta)} \right]$, for each $j = 1, 2, \cdots m$, and satisfying the following for all $(\alpha, \beta) \in V \times V$ and for each $j = 1, 2, \cdots m$,

$$NE_{S_j(\alpha, \beta)} \leq N_{S_j(\alpha)} \wedge N_{S_j(\beta)},$$

$$NE_{H_j(\alpha, \beta)} \leq N_{H_j(\alpha)} \wedge N_{H_j(\beta)},$$

and $F(\alpha, \beta) = (0, 0)$ for all $(\alpha, \beta) \in (V \times V - E)$. Here, $\left[N_{S_j(\alpha)}, N_{H_j(\alpha)} \right]$ and $\left[NE_{S_j(\alpha,\beta)}, N_{H_j(\alpha,\beta)} \right]$ represents j^{th} component

of degree of membership value of a vertex 'α' and (α, β) edge of a CIVmPF graph respectively.

Example 3.1. Here, an example of *interval-valued 3-polar fuzzy graph* has given below.

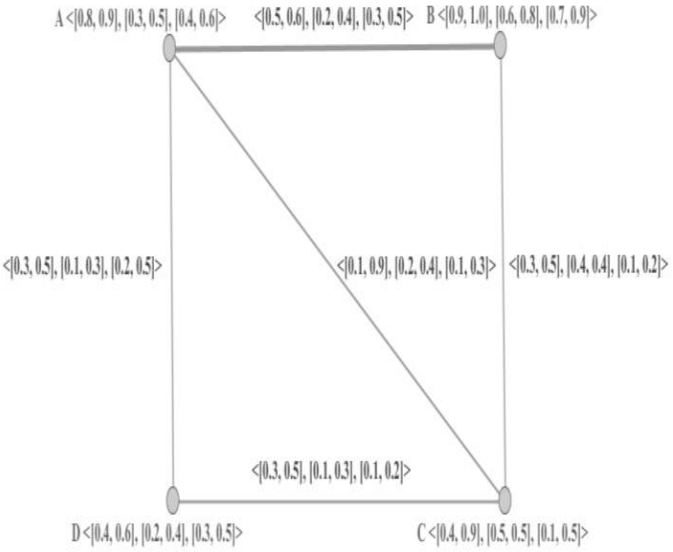

Figure 1: Interval-valued 3-polar fuzzy graph G

Defination 3.2. ACIVmPF graph
$G=(V, W, F)$ is said to be *complete* if, for each $j=1, 2, \cdots m$ and for each $\alpha, \beta \in V$

$$NE_{S_j(\alpha, \beta)} = N_{S_j(\alpha)} \wedge N_{S_j(\beta)},$$

$$NE_{H_j(\alpha, \beta)} = N_{H_j(\alpha)} \wedge N_{H_j(\beta)}.$$

Example 3.2. Here, an example of *complete closed interval-valued 3-polar fuzzy graph* has given below.

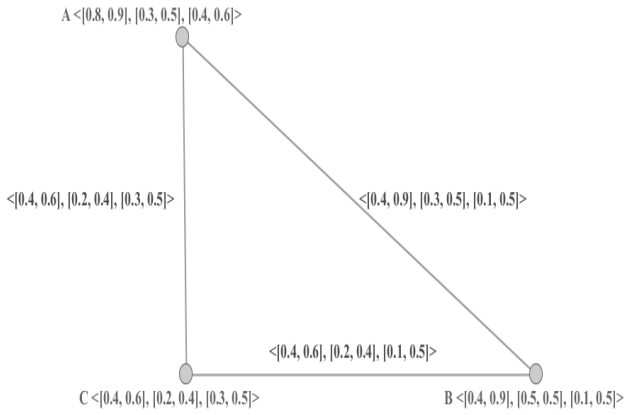

Figure 2: A complete Interval-valued 3-polar fuzzy graph G

Definition 3.3. ACIVmPF graph
$G=(V, W, F)$ with underlying crisp graph $G^*=(V, E)$ is said to be *strong* if, for each $j=1, 2, \cdots m$ and for each $(\alpha, \beta) \in E$

$$NE_{S_j(\alpha, \beta)} = N_{S_j(\alpha)} \wedge N_{S_j(\beta)},$$

$$NE_{H_j(\alpha, \beta)} = N_{H_j(\alpha)} \wedge N_{H_j(\beta)}.$$

Example 3.3. Here, an example of *strong interval-valued 3-polar fuzzy graph* has given below.

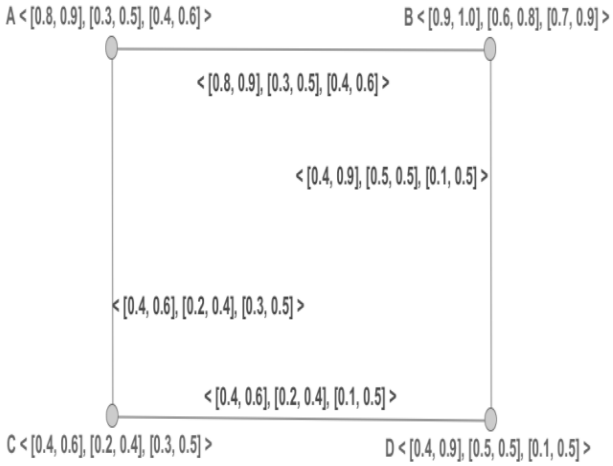

Figure 3: A strong Interval-valued 3-polar fuzzy graph G

Definition 3.4. The *degree of a vertex* α in aCIVmPFgraph is defined as

$$d_G(\alpha)=\left\langle \begin{array}{l} \sum_{(\alpha,\beta)\in E,\beta\in V}\left[NE_{S_1(\alpha,\beta)},NE_{H_1(\alpha,\beta)}\right], \\ \sum_{(\alpha,\beta)\in E,\beta\in V}\left[NE_{S_2(\alpha,\beta)},NE_{H_2(\alpha,\beta)}\right], \\ \cdots, \sum_{(\alpha,\beta)\in E,\beta\in V}\left[NE_{S_m(\alpha,\beta)},NE_{H_m(\alpha,\beta)}\right] \end{array} \right\rangle$$

.

Definition 3.5. The *degree of an edge* $(\alpha,\beta)\in E$ in aCIVmPF $G=(V,W,F)$ is defined as

$$d_G(\alpha,\beta)=d_G(\alpha)+d_G(\beta)-2\left\langle\left[NE_{S_1(\alpha,\beta)},NE_{H_1(\alpha,\beta)}\right],\left[NE_{S_2(\alpha,\beta)},NE_{H_2(\alpha,\beta)}\right],\cdots,\left[NE_{S_m(\alpha,\beta)},NE_{H_m(\alpha,\beta)}\right]\right\rangle$$

Definition 3.6. The total degree of an edge $(\alpha,\beta)\in E$ in aCIVmPFgraph $G=(V,W,F)$ is defined as

$$td_G(\alpha,\beta)=d_G(\alpha)+d_G(\beta)$$
$$-\left\langle \begin{array}{l} \left[NE_{S_1(\alpha,\beta)},NE_{H_1(\alpha,\beta)}\right],\left[NE_{S_2(\alpha,\beta)},NE_{H_2(\alpha,\beta)}\right], \\ \cdots,\left[NE_{S_m(\alpha,\beta)},NE_{H_m(\alpha,\beta)}\right] \end{array} \right\rangle$$

.

Throughout this paper, we considered

$<\left[\delta_1^-,\delta_1^+\right],\left[\delta_2^-,\delta_2^+\right],\cdots,\left[\delta_m^-,\delta_m^+\right]>$ as

$<\delta_1,\delta_2,\cdots,\delta_m>$,

$<\left[h_1^-,h_1^+\right],\left[h_2^-,h_2^+\right],\cdots,\left[h_m^-,h_m^+\right]>$ as

$<h_1,h_2,\cdots,h_m>$,

$<\left[\gamma_1^-,\gamma_1^+\right],\left[\gamma_2^-,\gamma_2^+\right],\cdots,\left[\gamma_m^-,\gamma_m^+\right]>$ as

$<\gamma_1,\gamma_2,\cdots,\gamma_m>$, and

$<\left[z_1^-,z_1^+\right],\left[z_2^-,z_2^+\right],\cdots,\left[z_m^-,z_m^+\right]>$ as

$<z_1,z_2,\cdots,z_m>$.

Definition 3.7. If every vertex in a CIVmPF graph $G=(V,W,F)$ has the same degree $<\delta_1,\delta_2,\cdots,\delta_m>$, then $G=(V,W,F)$ is called *regular*CIVmPFgraph or CIVmPFgraph of degree $<\delta_1,\delta_2,\cdots,\delta_m>$

Definition 3.8. If every edge in a CIVmPF graph $G=(V,W,F)$ has the same degree $<\delta_1,\delta_2,\cdots,\delta_m>$, then $G=(V,W,F)$ is called an *edge regular* CIVmPF graph.

Definition 3.9. If every edge in a CIVmPF $G=(V,W,F)$ has the same total degree $<\delta_1,\delta_2,\cdots,\delta_m>$, then $G=(V,W,F)$ is called *totally edge regular* CIVmPF graph.

Theorem 3.1.*Let* $G=(V,W,F)$ *be a CIVmPF graph on a cycle* $G^*=(V,E)$. *Then* $\sum_{v_j\in V}d_G(v_j)=\sum_{(v_j,v_k)\in E\ j\neq k}d_G(v_j,v_k)$.

Proof. Suppose that $G=(V,W,F)$ is aCIVmPF graph and G^* be a cycle $v_1v_2v_3\cdots v_nv_1$.

Now, we get

$$\sum_{j=1}^{n} d_G\left(v_j, v_{j+1}\right) = d_G\left(v_1, v_2\right) + d_G\left(v_2, v_3\right) + \cdots + d_G\left(v_n, v_1\right)$$

where $v_{n+1} = v_1$.

$$= d_G\left(v_1\right) + d_G\left(v_2\right) - 2\overline{NE}_{F(v_1, v_2)} +$$

$$d_G\left(v_2\right) + d_G\left(v_3\right) - 2\overline{NE}_{F(v_2, v_3)} + \cdots$$

$$+ d_G\left(v_n\right) + d_G\left(v_1\right) - 2\overline{NE}_{F(v_n, v_1)}$$

$$= 2\sum_{v_j \in V} d_G\left(v_j\right) - 2\sum_{j=1}^{n} \overline{NE}_{F(v_j, v_{j+1})}$$

$$= \sum_{v_j \in V} d_G\left(v_j\right) + \sum_{v_j \in V} d_G\left(v_j\right) - 2\sum_{j=1}^{n} \overline{NE}_{F(v_j, v_{j+1})}$$

$$= \sum_{v_j \in V} d_G\left(v_j\right) + 2\sum_{j=1}^{n} \overline{NE}_{F(v_j, v_{j+1})} \quad - 2\sum_{j=1}^{n} \overline{NE}_{F(v_j, v_{j+1})}$$

$$= \sum_{v_j \in V} d_G\left(v_j\right).$$

Hence, $\sum_{v_j \in V} d_G\left(v_j\right) = \sum_{\left(v_j, v_k\right) \in E \; j \neq k} d_G\left(v_j, v_k\right)$.

Remark 3.1. Let $G = (V, W, F)$ be a CIVmPFgraph on a crisp graph G^*. Then

$$\sum_{\left(v_j, v_k\right) \in E} d_G\left(v_j, v_k\right) = \sum_{\left(v_j, v_k\right) \in E} d_{G^*}\left(v_j, v_k\right) \overline{NE}_{F(v_j, v_k)},$$

where $d_{G^*}\left(v_j, v_k\right) = d_{G^*}\left(v_j\right) + d_{G^*}\left(v_k\right) - 2$, for all $\left(v_j, v_k\right) \in E$.

Theorem 3.2. *Let $G = (V, W, F)$ be a CIVmPFgraph on a c-regular crisp graph G^*. Then* $\sum_{\left(v_j, v_k\right) \in E} d_G\left(v_j, v_k\right) = (c-1) \sum_{v_j \in V} d_G\left(v_j\right)$.

Proof. From Remark 3.1., we have

$$\sum_{\left(v_j, v_k\right) \in E} d_G\left(v_j, v_k\right) = \sum_{\left(v_j, v_k\right) \in E} d_{G^*}\left(v_j, v_k\right) \overline{NE}_{F(v_j, v_k)}$$

$$= \sum_{v_j v_k \in E} \left(d_{G^*}\left(v_j\right) + d_{G^*}\left(v_k\right) - 2\right) \overline{NE}_{F(v_j, v_k)}$$. Since G^* is a regular crisp graph, we have the degree of every vertex in G^* is c. i.e. $d_{G^*}\left(v_j\right) = c$, So

$$\sum_{\left(v_j, v_k\right) \in E} d_G\left(v_j, v_k\right) = \left(c + c - 2\right) \sum_{\left(v_j, v_k\right) \in E} \overline{NE}_{F(v_j, v_k)},$$

$$\sum_{\left(v_j, v_k\right) \in E} d_G\left(v_j, v_k\right) = 2\left(c - 1\right) \sum_{\left(v_j, v_k\right) \in E} \overline{NE}_{F(v_j, v_k)},$$

$$\sum_{\left(v_j, v_k\right) \in E} d_G\left(v_j, v_k\right) = (c-1) \sum_{v_j \in V} \left(d_G\left(v_j\right)\right).$$

Theorem 3.3. *Let $G = (V, W, F)$ be a CIVmPFgraph on a crisp graph G^*. Then*

$$\sum_{\left(v_j, v_k\right) \in E} td_G\left(v_j, v_k\right) = \sum_{\left(v_j, v_k\right) \in E} d_{G^*}\left(v_j, v_k\right) \overline{NE}_{F(v_j, v_k)} +$$

$$+ \sum_{\left(v_j, v_k\right) \in E} \overline{NE}_{F(v_j, v_k)}.$$

Proof. From the definition of total edge degree of G, we get

$$\sum_{\left(v_j, v_k\right) \in E} td_G\left(v_j, v_k\right) = \sum_{\left(v_j, v_k\right) \in E} \left(d_G\left(v_j, v_k\right) + \overline{NE}_{F(v_j, v_k)}\right)$$

$$= \left(\sum_{\left(v_j, v_k\right) \in E} d_G\left(v_j, v_k\right) + \sum_{\left(v_j, v_k\right) \in E} \overline{NE}_{F(v_j, v_k)}\right).$$

From Remark 3.1., we have

$$\sum_{(v_j,v_k)\in E} td_G(v_j,v_k) = \sum_{(v_j,v_k)\in E} d_{G^*}(v_j,v_k)\overline{NE}_{F(v_j,v_k)} + + \sum_{(v_j,v_k)\in E} \overline{NE}_{F(v_j,v_k)}.$$

Theorem 3.4. *Let $G=(V,W,F)$ be a CIVmPFgraph. Then $\overline{NE}_F$ is a constant function if and only if the following conditions are equivalent*

i) G is an edge regular CIVmPFgraph.

ii) G is a totally edge regular CIVmPFgraph.

Proof. Suppose that $\overline{NE}_F$ is a constant function.

Then $\overline{NE}_{F(\alpha,\beta)} = <\gamma_1,\gamma_2,...,\gamma_m> \forall (\alpha,\beta)\in E$.

Let G be an edge regular CIVmPFgraph. Then for all $(v_j,v_\gamma)\in E$, $d_G(v_j,v_\gamma) = <\delta_1,\delta_2,\cdots,\delta_m>$.

Now we have to show that G is a totally edge regular CIVmPFgraph.

Now $td_G(v_j,v_\gamma) = d_G(v_j,v_\gamma) + \overline{NE}_{F(v_j,v_\gamma)}$

$= <\delta_1,\delta_2,\cdots,\delta_m> + <\gamma_1,\gamma_2,...,\gamma_m>$

$= <\delta_1+\gamma_1,\delta_2+\gamma_2,\cdots,\delta_m+\gamma_m>$ for all $(v_j,v_\gamma)\in E$. Then G is a totally edge regular CIVmPF graph. Now, let G be a $<h_1,h_2,\cdots,h_m>-$ totally edge regular CIVmPFgraph.

Then $td_G(v_j,v_\gamma) = <h_1,h_2,\cdots,h_m>$ for all $(v_j,v_\gamma)\in E$.

So, we have

$td_G(v_j,v_\gamma) = d_G(v_j,v_\gamma) + \overline{NE}_{F(v_j,v_\gamma)} = <h_1,h_2,\cdots,h_m>$.

Hence $d_G(v_j,v_\gamma) = <h_1,h_2,\cdots,h_m> - \overline{NE}_{F(v_j,v_\gamma)}$

$= <h_1-\gamma_1,h_2-\gamma_2,\cdots,h_m-\gamma_m>$.

Then G is an $<h_1-\gamma_1,h_2-\gamma_2,\cdots,h_m-\gamma_m>-$ edge regular CIVmPFgraph.

Conversely, suppose that G is an edge regular CIVmPFgraph and G is a totally edge regular CIVmPF graph which are equivalent. We have to prove that $\overline{NE}_F$ is a constant function. In a contrary way, we suppose that $\overline{NE}_F$ is not a constant function. Then $\overline{NE}_{F(v_j,v_\gamma)} \neq \overline{NE}_{F(v_\delta,v_s)}$ for at least one pair of edges $(v_j,v_\gamma),(v_\delta,v_s)\in E$. Let G be an $<\delta_1,\delta_2,\cdots,\delta_m>-$ edge regular CIVmPFgraph. Then $d_G(v_j,v_\gamma) = d_G(v_\delta,v_s) = <\delta_1,\delta_2,\cdots,\delta_m>$.

Hence for every $(v_j,v_\gamma)\in E$ and for every $(v_\delta,v_s)\in E$;

$td_G(v_j,v_\gamma) = d_G(v_j,v_\gamma) + \overline{NE}_{F(v_j,v_\gamma)}$

$= <\delta_1,\delta_2,\cdots,\delta_m> + \overline{NE}_{F(v_j,v_\gamma)}$

$td_G(v_\delta, v_s) = d_G(v_\delta, v_s) + \overrightarrow{NE}_{F(v_\delta, v_s)}$

$= <\delta_1, \delta_2, \cdots, \delta_m> + \overrightarrow{NE}_{F(v_\delta, v_s)}$. Since

$\overrightarrow{NE}_{F(v_j, v_\gamma)} \neq \overrightarrow{NE}_{F(v_\delta, v_s)}$,

we have $td_G(v_j, v_\gamma) \neq td_G(v_\delta, v_s)$. Hence G is not a totally edge regular CIVmPFgraph. This is a contradiction to our assumption. Hence $\overrightarrow{NE}_F$ is a constant function. In the same way, we can prove that $\overrightarrow{NE}_F$ is a constant function, when G is a totally edge regular CIVmPFgraph.

Theorem 3.5 *Let G^* be a h-regular crisp graph and $G = (V, W, F)$ be aCIVmPFgraph on G^*. Then, $\overrightarrow{NE}_F$ is a constant function if and only if G is both regular CIVmPFgraph and totally edge regular CIVmPF graph.*

Proof. Let $G = (V, W, F)$ be aCIVmPFgraph on G^* and let G^* be a $h-$regular crisp graph. Assume that $\overrightarrow{NE}_F$ is a constant function. Then $\overrightarrow{NE}_{F(\alpha,\beta)} = <\gamma_1, \gamma_2, \cdots, \gamma_m> \forall (\alpha, \beta) \in E$ where $\gamma_1, \gamma_2, \cdots, \gamma_m$ are constants. From the definition of degree of a vertex, we get

$d_G(v_j) = \sum_{(v_j, v_\gamma) \in E} \overrightarrow{NE}_{F(v_j, v_\gamma)}$

$= \sum_{(v_j, v_\gamma) \in E} <\gamma_1, \gamma_2, \cdots, \gamma_m>$

$= <h\gamma_1, h\gamma_2, \cdots, h\gamma_m>$

for every $v_j \in V$.

So $d_G(v_j) = <h\gamma_1, h\gamma_2, \cdots, h\gamma_m>$ for every $v_j \in V$. Therefore, G is a regular CIVmPFgraph.

Now $td_G(v_j, v_\gamma) = d_G(v_j) + d_G(v_\gamma) - \overrightarrow{NE}_{F(v_j, v_\gamma)}$

$= \sum \overrightarrow{NE}_{F(v_j, v_z)} + \sum \overrightarrow{NE}_{F(v_\gamma, v_z)} - \overrightarrow{NE}_{F(v_j, v_\gamma)}$

$= \sum_{\substack{(v_j, v_z) \in E \\ j \neq z}} <\gamma_1, \gamma_2, \cdots, \gamma_m>$

$+ \sum_{\substack{(v_\gamma, v_z) \in E \\ \gamma \neq z}} <\gamma_1, \gamma_2, \cdots, \gamma_m>$

$- <\gamma_1, \gamma_2, \cdots, \gamma_m>$

$= h <\gamma_1, \gamma_2, \cdots, \gamma_m>$

$+ h <\gamma_1, \gamma_2, \cdots, \gamma_m>$

$- <\gamma_1, \gamma_2, \cdots, \gamma_m>$

$= (2h-1) <\gamma_1, \gamma_2, \cdots, \gamma_m>$

For all $(v_j, v_\gamma) \in E$.

Hence G is also a totally edge regular CIVmPF graph.

Conversely, assume that G is both regular and totally edge regular CIVmPFgraph.

Now we have to prove that $\overrightarrow{NE}_F$ is a constant function. Since G is regular, $d_G(v_j) = <z_1, z_2, \cdots, z_m>$ for all $v_j \in V$. Also G is totally edge regular.

Hence $td_G(v_j, v_\gamma) = <h_1, h_2, \cdots, h_m>$ for all $(v_j, v_\gamma) \in E$.

From the definition of totally edge degree, we get

$td_G(v_j, v_\gamma) = d_G(v_j) + d_G(v_\gamma) - \overline{NE}_{F(v_j,v_\gamma)}$ for all $(v_j, v_\gamma) \in E$.

$< h_1, h_2, \cdots, h_m > = < z_1, z_2, \cdots, z_m > + < z_1, z_2, \cdots, z_m > - \overline{NE}_{F(v_j,v_\gamma)}$,

so $\overline{NE}_{F(v_j,v_\gamma)} = 2 < z_1, z_2, \cdots, z_m > - < h_1, h_2, \cdots, h_m >$

$=< 2z_1 - h_1, 2z_2 - h_2, \cdots, 2z_m - h_m >$ for all $(v_j, v_\gamma) \in E$. Hence $\overline{NE}_F$ is a constant function.

4. Conclusions

In this article, order and size of a CIVmPF graph are defined. Further, equivalence condition for edge regular CIVmPFgraph and totally edge regular CIVmPF graph is proved. We will extend our work on CIVmPF planar graphs and find some of its properties along with the applications in image segmentation and image processing.

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REAL-LIFE APPLICATIONS OF ORDINARY DIFFERENTIAL EQUATIONS

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ABSTRACT:

This study introduces real-life mathematical models of international relationships suitable for ordinary differential equations, by investigating conflicts between different nations or alliances. The system of differential equations are constructedbased on the work of Richardson. The solutions and the stability of systems of Oridinary Differential Equations are observed.

KEY WORDS: ODE, Arms race, Eigen values, Critical point, Armaments.

INTRODUCTION:

Ordinary differential equations (ODEs), especially systems of ODEs, have been applied in many fields such as physics, electronic engineering and population dynamics. This is a powerful tool for analysing the relationship between various dynamic quantities.In this paper we focus on the study of models describing international conflicts, which were originally derived by Lewis Fry Richardson, describing the relationship between two nations or two alliances that deem war to be imminent. In particular, he devised mathematical models of arms races using differential equations. One assumes that if one country increases its weapons, another country will do the same. Sequentially, the first country responds by storing more weapons. Richardson proposed that this kind of arms race can be represented by a pair of differential equations. Richardson's model of international relations, which includes an arm race, used for discussing stability, is analogous to the differential equations in the predator-prey model. In the present paper, firstly, a simpler model of an arms race is depicted. More realistic models are constructed, and additional factors that influence the relationship between two nations or alliances, such as the cost of armaments, the grievances between nations and their ambitions, are considered.

1. SIMPLE ARMS RACE FOR DIFFERENTIAL EQUATIONS:

It is a well-known fact that an increase in armaments is one of the primary reasons for war. Another reason is the unsolvable conflict of ambitions, such as occupying more territory or recovering tracts of land.

We assume that if one nation increases its armaments, then the opposing nation will do likewise because it assumes that the balance of power will be negatively affected.

Let x(t) be the armaments of nation X, and y(t) be the armaments of nation Y at time t. The rate of change of the armaments on one side depends on the number of armaments on the opposing side, because if one nation increases its armaments, the other will follow suit. That is, $dx/dt\ (or\ dy/dt)\ is\ proportional\ to\ y\ (or\ x)$.We assign constants of proportionally h and 1 to x and y, respectively, which represent the efficiency of increasing armaments.
Hence, we can establish a system of differential equations in the following form:

$$\frac{dx}{dt} = kx \qquad (1.1)$$

$$\frac{dy}{dt} = ky$$

Thissystemcanbeusedtodescribetherelationshipbetweentwonationsoralliances,eachofwhichdecidestodefenditselfagainstpossibleattackbytheother.

It is easy to obtain the solutions for the system (1.1) which we give as follows:

$$x(t) = \sqrt{\frac{k}{l}}\ (Ae^{t\sqrt{kl}} - Be^{-t\sqrt{kl}}),$$

$$y(t) = (Ae^{t\sqrt{kl}} - Be^{-t\sqrt{kl}}) \qquad (1.2)$$

Given initial conditions,
x (0)=x_O,y (0)=y_O
we can obtain

$$A = \frac{1}{2}\left(y_0 + \sqrt{\frac{l}{k}}x_0\right) \quad (1.3)$$

$$B = \frac{1}{2}\left(y_0 - \sqrt{\frac{l}{k}}x_0\right)$$

It is possible to estimate the values of $k\ and\ l$. For example, when y remains a constant C, it follows from (1.1)that

$$(1.4)\ \frac{1}{k} = \frac{C}{\frac{dx}{dt}} = C\ \frac{dt}{dx}$$

Solving (1.4) we obtain

$$(1.5) \qquad \frac{1}{k}x = Ct + b$$

Assuming x(0) = 0, it follows from (2.5)

that b = 0and

$$\frac{1}{k} = \frac{C}{x}t\ \ for\ x > 0$$

Hence when Xhas caught up to Y, which means X= C, we have$\frac{1}{k} = t$ Thus $\frac{1}{k}$ is the time required for nation Xto catch up with the armaments of Y provided that y remains constant. Richardson also observed that k is proportional to the amount of industry in a country.

2. CONSTRUCTION OF A REALISTIC MODEL

The relationship between nations or alliances in the real world is more complicated. We therefore need to modify the system (2.1) by considering more factors thataffectthechangeratesdx/dtanddy/dtinanefforttoadaptittotherealworld. Richardsonconstructeddifferentialequationsofconflict,takingintoaccountfactors suchasthecostofarmaments,grievancesorambitionsbetweennations,etc([1], 1993;[11],1957).Thesystemconstructedfordescribingtherelationshipbetween the nations or alliances, X and Y, is asfollows:

$$\frac{dx}{dt} = ky - \alpha x + g \qquad (2.1)$$

$$\frac{dy}{dt} = lx - \beta y + h, \qquad k, l, \alpha, \beta, g, h > 0$$

where $x(t)$ $(respectively\ y(t))$ denotes the armaments of nation X(Y); $k(l)$ is the efficiency of increasing the armaments of X(Y); $g(h)$ is the ambitions of or grievances that X(Y) has towards Y(X) , affecting dx/dt (dy/dt) positively the influence of the cost of armaments is a restraining factor, represented by $-\alpha x(\beta y)$.

We encourage students to observe the stability of system (1.1) by finding Σ and analysing the critical point. This is an excellent exercise for students to familiarise themselves with the classification of a critical point by stability and type, utilising the eigenvalues. The stability of the critical point of the system (2.1) depends on the logical relationship between $kl\ and\ \alpha\beta$.

It would entail a great deal of work to simplify the solutions to system (2.1).

Given the initial conditions $x(0) = x_0, y(0) = y_0$, the unique solution to (2.1) can be written as follows:

$$x(t) = x_1 + \frac{kl}{2\mu(\mu+\omega)}\ Ae^{\lambda_1 t} + \frac{1}{2}\frac{\mu+\omega}{\mu}\ Be^{\lambda_2 t} \quad (2.2)$$

$$y(t) = y_1 + \frac{l}{2\mu}\ Ae^{\lambda_1 t} - \frac{l}{2\mu}\ Be^{\lambda_2 t} \quad (2.3)$$

Where $(x_1, y_1) = \left(\frac{\beta g + hk}{\alpha\beta - kl}, \frac{\alpha h + gl}{\alpha\beta - kl}\right)$
Is the critical point

$$\lambda_1 = -\frac{1}{2}(\alpha+\beta) + \frac{1}{2}\sqrt{(\alpha-\beta)^2 + 4kl}$$

$$\lambda_2 = -\frac{1}{2}(\alpha+\beta) - \frac{1}{2}\sqrt{(\alpha-\beta)^2 + 4kl}$$

Are Eigen values and

$$\omega = \tfrac{1}{2}(\alpha-\beta), \mu = \sqrt{\omega^2 + kl} \quad (2.4)$$

$$A = \left(x_0 + \frac{g}{\lambda_1}\right) + \frac{\mu+\omega}{l}\ (y_0 + \frac{h}{\lambda_1}) \quad (2.5)$$

$$B = \left(x_0 + \frac{g}{\lambda_2}\right) - \frac{k}{\mu+\omega}\ (y_0 + \frac{h}{\lambda_2}) \quad (2.6)$$

Finally, we estimate the coefficients in our model. It is interesting to note that Richardson estimates $\alpha^{-1}(\beta^{-1})$ to be thelifetime of X's (Y's) parliament ([2]). For example, since the lifetime of Britain's parliament is five years, we obtain α= 0.2 for that country.

To estimate $k\ and\ l$, for example, we consider $g = 0\ and\ y = C$. Hence

$$\frac{dx}{dt} = kc - \alpha x$$

Assuming $x(0) = 0$ and solving the above equation, we obtain:

$$x = \frac{kC}{\alpha}\ (1 - e^{-\alpha t}) \quad (2.7)$$

Substituting the power series expansion

$$e^{-\alpha t} = \sum_{n=0}^{\infty} \frac{(-\alpha t)^n}{n!} = 1 - \alpha t + \cdots \ldots \ldots \ldots$$

In (2.7), since $\alpha t < 1$, $we\ have$

$$x \approx \frac{kC}{\alpha}\ \alpha t \quad for \quad t > 0$$

That is $\frac{1}{k} = \frac{C}{x}\ t$

Thus $\frac{1}{k}$ isthetimerequiredforX tocatchuptoY,ifY'sarmamentsonlyremain a constant C. We recall that k represents the product efficiency of armaments of nationX.Itisobviousthatausefulexerciseistoapp lytheknowledgetoseries.

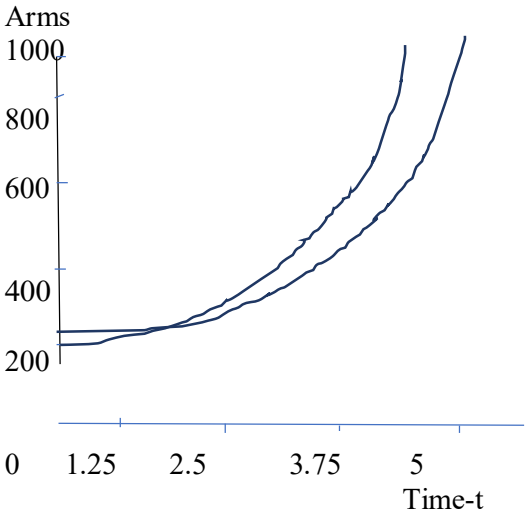


FIGURE1:Solutionstothemodel(3.1)with k=0.6,l=0.8,$\alpha = \beta$=0.2, $x_0 = 100$, $y_0 = 80$.

expansion of functions. We note that our method of estimating k is different from the method given in [2], in which the constant k is estimated in the following way, assuming $g = 0$ *and* $y = y_1$:
when $x = 0$,

$$\frac{1}{k} = \frac{y_1}{\frac{dx}{dt}}.$$

A future work could include the collection of data and information on historical wars to construct mathematical models. For example, during the Cold War, both the USA and the Soviet Union were involved in an arms race for conventional and nuclear weapons.

Here we only give some examples and graphs, choosing different values for the constants k, l, α, β. We assume $g = h = 0$, so $x_1 = y_1 = 0$. We use a solid line to represent the solution $x(t)$, and a grey line for the solution $y(t)$.

If k = 0.6, l = 0.8, $\alpha = \beta = 0.2$, $x_0 = 100$, y_0=80, the solutions and graphs are as follows (unstable case, $\alpha\beta < kl, \lambda_1 > 0 > \lambda_2$) (see Figure 1)

$$x(t) = 84.641\ exp\ (0.49282t) + 15.359\ exp\ (-0.89282t)$$

$$y(t) = 97.735\ exp\ (049288t) - 17.735\ exp\ (-0.89282t)$$

If k = 0.35, l = 0.4, $\alpha = 0.3, \beta = 0.5$, $x_0 = 100$, y_0=95,

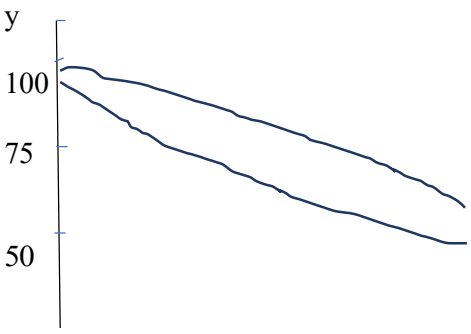
the solutions and graphs are as follows (unstable case, $\alpha\beta < kl, \lambda_2 < \lambda_1 < 0$) (see Figure 1)

$$x(t) = 105.84\ exp\ (-1.2702 * 10^{-2}t) - 5.8355\ exp\ (-0.7873t)$$

$$y(t) = 8.1247\ exp\ (-0.7873t) + 86.875\ exp\ (-1.2702 * 10^{-2}t)$$

Conclusion:

We believe that more research could be conducted into the mathematical modelling of international relationships at undergraduate level. Such modelling also has realistic applications in military, business and other fields. From an educational perspective, these mathematical models are also realistic applications of ordinary differential equations (ODEs) — hence the proposal that these models should be added to ODE textbooks as flexible and vivid examples to illustrate and study differential equations.



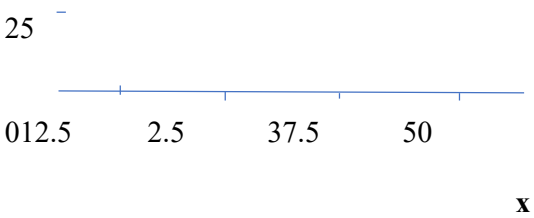


Figure2: Solutions to the model (3.1) $\boldsymbol{with\ k = 0.6,\ l = 0.8\ \alpha = \beta = 0.2, x_0 = 100, y_0 = 80}$.

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GET OCEAN OF VOCABULARY, GET COMMAND OVER THE LANGUAGE

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KEY WORDS:

Abstract:
This paper is to enlighten the importance of Vocabulary in language learning. Learning is a continuous process; it needs a full time effort to learn anything. When it comes to vocabulary learning, it needs curiosity, interest, hard work and consistency. Learning 1st language or native language learning is easy and fast compare to new language learning depend on personal interest or need of the particular language learning.
To make oneself good and fluency speaker; vocabulary plays a vital role. This vocabulary building can do via reading listening and speaking. The more she/he practice and research the more she/he will get command over the language. Various techniques are useful for vocabulary building it plays the 'key role' for getting command on new language or foreign language.

I. INTRODUCTION:

Human being's learning starts soon after their birth, 1st they will learn gesture, speaking tone, love with affection and facial expression. Gradually they learn to respond and show their feel or needs, even though they can't talk but by their cry smile and laugh they will make others understand what and how they feel and about their needs.
This learning leads to learn vocabulary building, as they have the ability of hearing and talking but don't know how to talk or how to response for what they heard—they slowly start making noise slimier to their speaker, and imitate the words, and the learning process starts. At beginning they can learn 50 to 60 words. It increases by time passes. Vocabulary learning is a continuous process, and follows the same rule for all languages, and needs extra efforts to learn other language than 1st language. Importance of vocabulary in all language, learning& utilizing the words correctly, suggestions to learn

What is Vocabulary?

- Vocabulary is the bank of words in different languages.
- Vocabulary is the necessary word bank; which need to memorise with meaning and usage in new language learning.
- Vocabulary is the bridge between the learning and language.

Types of Vocabulary:

There are four types of vocabularies, they are Listening, Writing, Reading and Speaking.

- **Listening Vocabulary:**
  This skill getting developed before the birth of human, babies inside the womb can listen the words. After the birth babies listen every words, gradually they start responding for 20% to 40% words they listen, this process is a

continuous process an adult can comprehend 80% to 90% words what she/he listen.

When it comes to dumb kid; sign language is the only option to learn new language here ratio is very low.

- **Writing Vocabulary:**
  Writing vocabulary is the words which human and writes by knowing its meaning and context. Here we use punctuation marks to express emotion or to give signal to the reader, as in writing we don't have an opportunity to express ourselves through facial expression or modulation of voice/tone. It has 3 levels.
  Level-1: here we start learning letter and joining them together. In this level easy spelling given to the learner which he/she can remember easily. Eh. Can, will, cat, bat, girl, brother etc also learn basic expressive words such as happy, sad, fast, help, slow etc. Class one to 7th students.
  Level-2: here learners will learn words with high frequency such as, empathy, condolence, etc. Class 8th to 12th students.
  Level-3: here learners will learn words from specific category such as Science, Maths, Geography and Medicine etc, class 12th to UG and PG students.
- **Reading Vocabulary:**
  It is second largest vocabulary bank, it is related to the text we read, we can read enumerable words but it is not necessary that we understand all, this skill is related to our comprehension that what we read we understand it. Very often we don't use the words, we read in our daily life limitation of this vocabulary is varying person to person and their need.
  In the beginning human can read and understand basic language, gradually they get the command over the language in result can read and comprehend complex text.
- **Speaking Vocabulary:**
  Speaking Vocabulary refers to the words we speak. Our speaking vocabulary is restricted. Most of the adults use almost 5000 to 10000 words for communication (for conversation and giving instructions). The number of words used in this case is far less than listening vocabulary, the reason being the level of comfort in usage.
  At early age we can speak few words slowly it increases and development t takes place at the age of adult and it get finer with experience and usage.

Category of Vocabulary:

a. **Receptive Vocabulary**
   Receptive vocabulary is words that learners recognize and understand when they are used in context, but which they cannot produce. It is vocabulary that learners recognize when they see or meet in reading text but do not use it in speaking and writing

b. **Productive Vocabulary**
   Productive vocabulary is the words that the learners understand and can pronounce correctly and uses constructively in speaking and writing. It involves what is needed for receptive vocabulary plus the ability to speak or write at the appropriate time. Therefore, productive vocabulary can be addressed as an active process, because the learners can produce the words to express their thoughts to others (ALQAHTANI, 2015)

II. TECHNIQUES TO DEVELOP VOCABULARY:

Learn and use New Words Every Day :-

To improve your vocabulary quickly, make an effort to learn at least one new word every

singleday. There are plenty of ways to do this, such as a Word of the Day calendar or email list, or simply picking a word from a thesaurus or dictionary. Once you learn a new word try to use those words in our daily life. Use the new words in your daily conversations, journal entry, an assignment or an email to a friend in this way you can have a common over the language.

Look up Words You Don't Know

we often come across new words that are unfamiliar to us. Don't just gloss over them but taketime to look them up, and if you don't have the time right then, write them down and look them up later in this way we learn new words.

III. AVOID THE TEMPTATION TO TRANSLATE WORDS INTO YOUR NATIVE LANGUAGE.

Instead, write a few synonyms or a sentence that makes the meaning of the word obvious. This will force you to think about the concepts and the meanings of the words instead of their translations in your native language.

Learn in a peaceful setting.

Block out any distractions: close your door, wear earplugs, or switch your phone to airplane mode. Set a timer for your session. It will help you to learn the new vocabulary very easily.

Make Your Own Vocabulary Tests

Keep a list of the new words you learn each week and incorporate into writing and conversation. At the end of each week, make yourself a quiz using the words to cement them in your memory.

Practice with Word Games

Playing word games is another simple tactic for improving the vocabulary. Start with a quick game that requires no tools other than your friends and your brain. For variety, players can take a slightly different route and suggest a synonym to the word. Players can also challenge the answer if they think someone is incorrect or bluffing. Referring to the Dictionary is great way to check answers and learn new words along the way. The point of the game is to bring an element of novelty and fun to learning and recalling a variety of words (how to increase your vocabulary, 2018)

Conclusion: - English vocabulary is complex , when learning vocabulary it needs lot of curiosity and personal interest . vocabulary plays a vital role in every person's life. Vocabulary learning is a continuous process and follows the same rules for all the languages. There are different types of vocabularies they are listening, writing , speaking and reading. vocabulary is words that learners recognize and understand when they are used in contextand uses constructively in speaking and writing. Vocabulary can be built by learning new words every day and by using them in daily conversations and get command over the language by using the proper vocabulary.

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MOMENT OF INERTIA BASED RADIAL CODING FEATURES OF INVARIANT CHARACTER RECOGNITION USING FUZZY MIN-MAX NEURAL NETWORKS

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ABSTRACT

This paper proposes a character recognition system that is invariant to translation, rotation and scale. The system has two main components feature extraction and recognition. The feature extraction is carried out using moment of inertia based radial coding features. The main advantage of this feature vector is that it doesn't require the normalization of character. These features also easy to understand and implement compared to other methods computer requirements are also negligible. The Fuzzy Min-Max neural network (FMNN) is used in the recognition phase. The nine dimensional feature vector consists of Normalized moment of inertia and eight radial coding features. The character recognition systems is tested on 26 uppercase typed and hand written English letters. This character recognition system is also tested on different fonts (Ariel Unicode, Ariel Narrow, Microsoft scan serif) and hand written characters of five different writers.

Key words: Character Recognition System, Fuzzy Min-Max Neural network, Invariant Character Recognition, Moment of Inertia, and Radial Coding Features.

I. Introduction

Character recognition is one of the most successful applications of pattern recognition. Automated character recognition is of vital importance in many industries such as banking and shipping. A variety of character recognition methods are available such as boundary-based analysis via Fourier descriptors [3], neural-networks models [4] and invariant moment's [5]. Boundary-based analysis using discrete Fourier transforms has been proposed for character recognition. Algorithms based on this kind of analysis are called Fourier descriptors and basically, invariance is obtained by normalizing the frequency representation of the character shape. Its major drawback is that it is unable to cope with large translations and rotations in the character. High-order networks have been utilized recently for invariant recognition.

In this type of model, one has to encode the properties of invariance in the values of the synaptic weights. The relations between pixels of the characters are used, and the invariance is directly constructed in the network. The number of combinations of possible relations between pixels increases in a nonlinear proportion to the number of input data. This is the main disadvantage of this approach. However, most of these methods are too computationally expensive or are not invariant under the three types of transformations: scaling, translation and rotation.

Invariant Character Recognition (ICR) that achieves excellent invariance under translation, rotation and scaling is proposed. The main contribution in this paper is the development and implementation of one new feature and use different character recognition algorithm for the improving character recognition performance.

II. Basic Block Diagram of Recognition System

Recognition can be defined as class assignment for input pattern that are not identical to the patterns used for training of

the classifier. Figure 1 shows the basic block diagram of recognition or classification system [2]. The recognition system consists of input transducer providing input pattern data to feature extractor. Inputs to the feature extractor are sets of data vectors; each such set of data vector consists of real numbers for given application. The converted data at the output of the transducer can be compressed while still maintaining same level of machine performance called as features. The feature space dimensionality is to be much smaller than dimensionality of pattern space. Classifier assigns a class to input pattern by using extracted features of feature extractor.

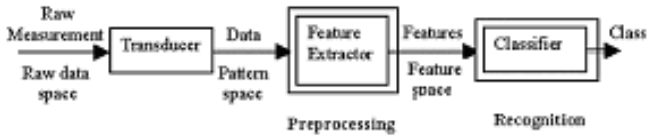


Figure 1 Basic block diagram of recognition system

III. PREPROCESSING

In invariant character recognition method, preprocessing is defined as the extraction of appropriate invariant features that are then used for recognition by a classification system. Feature can be defined as quantitative description of input character with in less dimension space and which is invariant under translation rotation and scale. The features play an important role in the recognition and classification system. Because the total information related to input character consists with in the extracted feature values. According to these feature values the high discriminate power of the classifier classifies the input character. The invariant features in this method are real numbers that are fed as vectors to the classification system.

The proposed invariant feature extraction takes reference from the centroid of the binary character. To find the centroid of two-dimensional object treat character as a very thin plate divide the object into small areas dA. For finding the centroid of object take the sum of the product of each area and the distance to an axis then divide by the total area of the object.

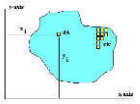


Figure.2 Centroid of the 2-D object

Centroid of character is calculated as follows:

For a given character the summation of product of each pixel x-coordinate and its gray value and divide the total number of character pixels in the character gives the x-coordinate of centroid.

$$C_x = \frac{\sum_{i=1}^{N} x_i * f(x,y)}{N} \qquad (1)$$

Similarly y-coordinate of centroid can be calculated.

$$C_y = \frac{\sum_{i=1}^{N} y_i * f(x,y)}{N} \qquad (2)$$

The centroid position is constant, even if the character is translated from its original position or rotates or scaled it. Taking reference as the centroid the Normalized moment of inertia radial coding features are found.

3.1 Normalized Moment of Inertia (NMI)

In general the moment of inertia quantifies the inertia of rotating object by considering its mass distribution. The moment of inertia is normally calculated by dividing the object into N-small pieces of mass m_1, m_2…..m_N. Each pieces at a distance r_1, r_2…r_N from the axis. The moment inertia of the object is

$$I = \sum_{i=1}^{N} d_i^{\,2} = \sum_{i=1}^{N} ((x_i - C_x)^2 + (y_i - C_y)^2) \qquad (3)$$

where C_x, C_y are the centroid co-ordinates. x_i, y_i the image pixel co-ordinates of the character. 'N' is the total number of pixels in the character. By dividing moment of inertia by N^2 (we will name it I_N) we get the Normalized moment of inertia. Due to the finite resolution of any digitized image, a rotated character may not conserve the number of pixels intact. So moment of inertia may vary but using normalized moment of inertia reduces this problem. The value of normalized moment of inertia invariant under translation rotation and scale invariant. The character 'A' and 'B' with different

orientations showed in Figure 3, and results shown in Table 1

(a) 0 (b) 25 (c) 55 (d) 75 (e) 90

(a) 0 (b) 25 (c) 55 (d) 75 (e) 90

Figure.3 Testing images of letter 'A' and 'B' for different orientations

Table 1: NMI Features for Characters 'A' and 'B' for different orientations.

Cases		(a)	(b)	(c)	(d)	(e)
NMI	A	0.2902	0.2933	0.2985	0.2940	0.2957
	B	0.3061	02768	0.2819	0.2760	0.2838

3.2 Radial Coding Features

The radial coding features are based on the fact that circle is the only geometrical shape that is naturally and perfectly invariant to rotation. In this we consider the number of intensity changes on two circular boundaries of some radius inside the character as it crosses it. This simple coding scheme extracts the topological characteristics of the character regardless of its position orientation and size. The methodology to obtain the radial coding features of a character can be summarized as follows:
1) Obtain the centroid of the character.

2) Generate *K* equidistant constant circles C_i around the centroid. The spacing is equal to the distance between the centroid and furthest pixel of the object divided by *K*.

3) For each circular boundary, count the number of intensity changes (zero to one or one to zero) that occur in the image.

In the above parameters the first value is the centroid pixel value. The remaining values are number of changes in pixel values on the circle. Combining these normalized moment of inertia and radial coding features we develop a feature vector call as moment of inertia based radial coding features is input to the classification system.

IV. CHARACTER RECOGNITION SYSTEM

Proposed block diagram of character recognition system consists of two main blocks Preprocessing and Recognition shown in Figure 4. In preprocessing block we extract the Normalized moment of inertia and radial coding features of character. The radial coding method gives the number of intensity changes on the circular boundaries of some radius inside the character around the centroid develops eight features. Combining these features to develop a ten dimensional training feature vector in which nine attributes are features tenth one assigned as pattern class. For testing the characters the feature vector is of nine dimensions only except the class of character.

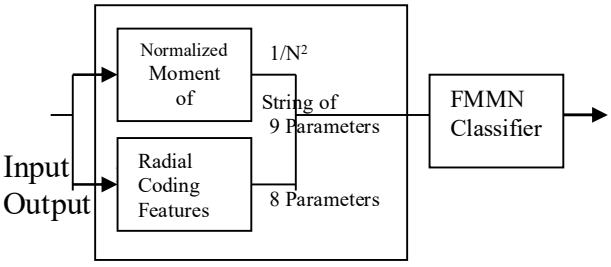


Figure 4 Block diagram of character recognition system.

The fuzzy min-max neural network (FMMN) proposed by Patrick Simpson [8] is a supervised

learning neural network (NN) classifier that utilizes fuzzy sets as pattern classes. A fuzzy set hyperbox is an n-dimensional box defined by a min point and a max point with corresponding membership function. The min-max points are determined using the fuzzy min-max learning algorithm. An expansion-contraction process learns nonlinear class boundaries in a single pass through data and provides the ability to incorporate new and refine existing classes without retraining.

It is a three layer feed forward neural network shown in Figure 5. F_A, F_B, and F_C represent these three layers respectively. F_A layer consists of *n* processing nodes equal to the dimension of the input pattern. The number of nodes in F_B layer is created during training, each F_B node in this layer represents a hyperbox fuzzy set where F_A to F_B connections is the min-max points of hyper box and the F_B transfer function is the hyper box membership function. The min points are stored in matrix *V* and max points are stored in matrix *W*. The connections are adjusted using learning algorithm. The F_C layer consists of *m* nodes, each F_C node represent a class.

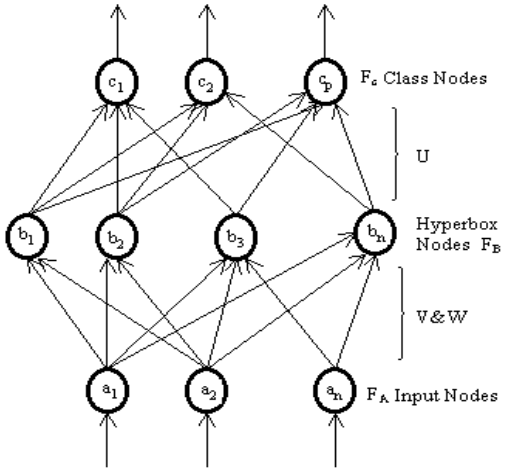


Figure.5 The Architecture of FMMN

The FMMN learning algorithm has four steps. They are initialization, hyperbox expansion, hyperbox overlap test and contraction. Initialization process is to create the first hyperbox with the first input pattern equal to the min-max points of the hyperbox. Hyperbox expansion processes test the expansion criteria of all ready created same class of max membership value hyperbox with presented input pattern. Overlap test allows the overlap between the hyperboxes from the same class and eliminates the overlap between the hyperboxes of different classes. Checks the overlap with the all dimensions of hyperbox and stores the minimum overlap dimension. In contraction process contract the overlapped hyperboxes along the minimum overlap dimension. The last three steps are repeated for all input patterns.

V. RESULTS

The character recognition system is tested using the 26 uppercase letters of the alphabet. *Twelve* different sizes and *eight* different orientations of each of 26 alphabets ninety-six experimental characters for each of the alphabet and in total 2496 experimental characters for all alphabets were generated. The largest character consists of 65x65 white pixels and smallest character consists of 15x15 white pixels. The Figure 6 shows few of the generated characters of letter E for different orientations and different sizes.

Learning Phase:

In order to obtain increased noise tolerance, during learning stage fifty percent of the randomly selected patterns from the total database used for learning. These patterns are called as *training set* including the class of character. Ten-dimension feature vector forms each training vector, in which first nine attributes are features and last one is its identifier. The first attribute is the normalized moment of inertia. The remaining eight features are number of changes of intensity pixel values, when the eight circles are intersected around the centroid of the character.

Recognition Phase:

Each one of the 96 characters for all the 26 letters were used as the *testing data set*. During this recognition phase all the extracted features of testing data set except class were presented to the character recognition system and their classes were found out. The results were then compared with original class of the character presented.

Case	NMI	CHARACTER 'X'
(a)	0.3381	1 0 3 4 4 4 4
(b)	0.3036	1 0 2 3 4 4 4
(c)	0.3146	1 0 2 4 4 4 4
(d)	0.3133	1 0 3 4 4 4 4
(e)	0.3356	1 0 3 4 4 4 4
(f)	0.3218	1 0 3 4 4 4 4
(g)	0.3384	1 0 3 4 4 4 4
(h)	0.3426	1 0 3 4 4 4 4

It is important to mention that most of the characters are used to test the method present a certain degree of noise or deformation. The noise is intrinsically produced during the transformation of the letters to other sizes and orientations.

Table 2 demonstrates moment of inertia based radial coding features of character 'X' with different sizes and different orientations (0, 10, 25, 30.55, 75, 90, and 110).

One can observe that the moment of inertia based radial coding features for character 'X' almost constant (with marginal variations) even though size, position and rotation of the character are changed.

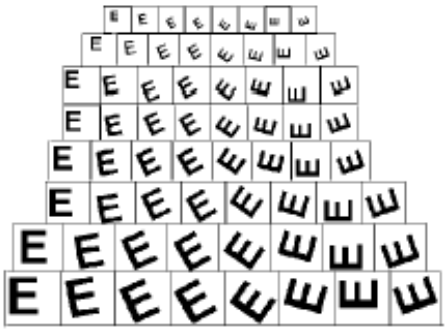
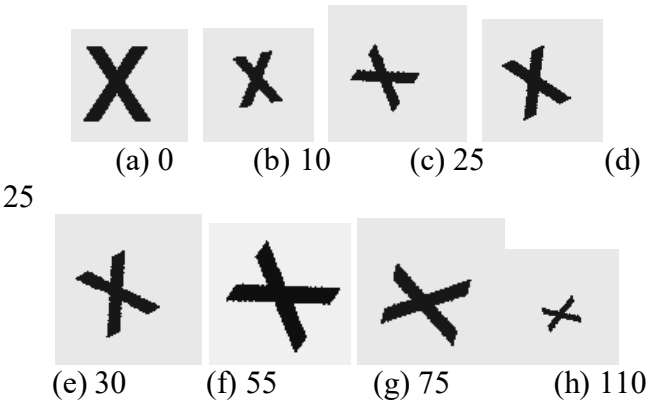


Figure 6: Testing images of letter 'E' for different orientations

Table 2: Moment of inertia based radial coding features for letter 'X' for different orientations and different sizes.



Figue 7: Testing character of letter 'X' for different orientations

These feature vectors can be used as input to the FMMN classification algorithm. The character recognition system is implemented on Pentium IV 1.4 GHz PC. The total database is used for the testing set of recognition purpose. The algorithm tested for this database moment of inertia based radial coding features. The percentage of recognition rate can be defined as

$$RECOGNITIONRATE = \frac{Number\ of\ tested\ samples\ being\ correctly\ recognized}{Total\ number\ of\ tested\ samples}$$

Initially, the FMMN algorithm is trained with different size of trained parameter θ *and* γ (sensitivity parameter) equal to one.

5.1 Results of single type of fonts

The results obtained with combination of moment of inertia and radial coding features shown in Table 3 and Table 4. The Table 3 shows the FMMN algorithm creates 404 hyperboxes and yields 100% recognition for training database. The table 4 shows the performance of FMMN algorithm with testing database and gives 98% recognition at which θ=0.03.

Table 3: Hyperboxes created and recognition rates obtained with the Training data set of moment inertia based radial coding Features

Font type	%Recognition rate
Microsoft Scan serif	78.0
Ariel Unicode	82.0
Ariel Narrow	78.0

Hyperbox size	No.of created	%Recognition
0.05	280	97.5
0.04	331	97.9
0.03	404	98.0

Table 4: Hyperboxes created and recognition rates obtained with the Testing data set of moment inertia based radial coding Features

Hyperbox size	No.of created	%Recognition
0.02	404	100

The trained classifier with moment of inertia based radial coding features used to find out the average percent recognition for each of the 26 letters. The ninety-six patterns of each character samples are given as input to the character recognition system

Letters	A	B	C	D	E	F	G	H	I	J	K	L	M
Percent Recognition	100	94	100	98	97	98	99	99	100	98	100	99	96

finds out the average percent recognition. The Table 5 shows the average percent recognition for each of the 26 letters and results shown in graph of Figure 8.

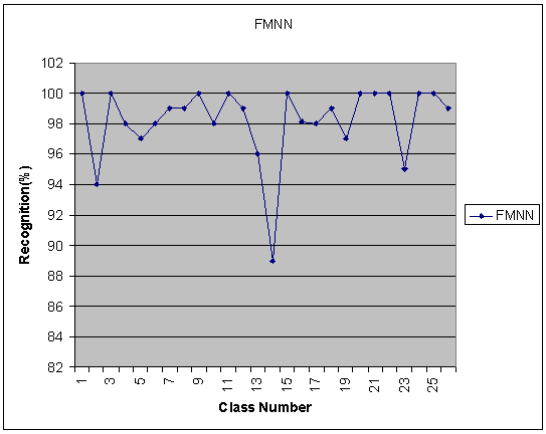


Figure 8 Average percent recognition of each of the 26 letters with graph.

Table 5: Average percent recognition for each of the 26 letters

Letters	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Percent Recognition	89	100	98	98	99	97	100	100	100	95	100	100	99

5.2 Results of different type of fonts

The character recognition system was also used test the different fonts (Arial Unicode, Arial Narrow, Microsoft scan Serif) of characters. The algorithm is trained with single font of database test with the different fonts. The Table 6 shows the percent recognition of different fonts. Mixed font of database prepared by taken a fifty percent of the data from each font of character. The algorithm is trained with mixed fonts of database test with the different fonts.

The Table 7 shows the percent recognition of different fonts.

Table 6: Percentage Recognition Rates of Three Different types of Font with Single font in Training at θ=0.03

Table 7: Percentage Recognition Rates of Three Different types of Font with Mixed fonts in Training at θ=0.03

Font type	%Recognition rate
Microsoft Scan	93.0
Ariel Unicode	97.0
Ariel Narrow	86.0

5.3 Results of handwritten characters

Character recognition system was also used to test for hand written characters of five different writers and seven different orientations (0, 10, 25, 30, 55, 75, and 90). The database prepare with these orientations for all five different writers. The fifty percent of the total database randomly selected used for training the classifier. The Table 8 shows the FMMN algorithm creates 270 hyperboxes and yields 100% recognition rate of training data set.

Table 8: Hyperboxes created and Recognition rates are obtained with the Training data set of moment of inertia based Radial Coding Features

Hyperbox size	No.of created	%Recognition
0.02	270	100

The total prepared database of hand written characters used for testing the FMMN algorithm. Table 9 shows FMMN algorithm yields 85% recognition rate for testing data set at which $\theta = 0.02$

Table 9: Hyperboxes created and Recognition rates are obtained with the Testing data set of moment of inertia based Radial Coding Features

Hyperbox	No. of created Hyperboxes	%Recognition rate
0.04	217	82.4
0.03	238	83.7
0.02	270	85.0

CONCLUSION

This work demonstrates a novel system to recognize the characters. The character recognition system is invariant to translation, rotation and scaling is reported to a very good recognition. This implemented recognition system based on FMMN classification algorithm is most robust and easy to implement. It is observed that the recall time of FMMN is small if the created hyperboxes are less. So choose the value of θ which will create less number of hyperboxes and recognize all the training patterns correctly.

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SIGNIFICANCE OF PROFESSIONAL COMMUNICATION AMONG ENGINEERING STUDENTS

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Abstract:

Communication skills are indispensible to students at all levels and in all walks of life throughout their professional and personal life. English Language communication has to be a dominant force. English Language communication is an inter linking process in an educational organization that pleases psychologically, unites the students socially, develops them functionally and establishes them professionally. It is an individual student necessity and educational institute imperative. Communication is a natural, ubiquitous behavioral process. Communication is the enabler of all management processes and functions. Generally students go on pep talk among themselves whiling away time or sharing pleasure or pain.

Sometimes students focus on baseless information created out of emotional thinking as sort of fanciful speculation. It is high time for the students to divert their unprofessional communication to professional communication. In view of the growing importance of English as a tool for a global communication and the consequent emphasis on training students to acquire language skills, the syllabus of English has been designed to develop linguistic and communicative competence of professional students. Communication is an important skill that not only reveals students' personality but also their domain knowledge, etiquette, and soft skills, etc. They develop professionalism among the students to communicate effectively with other peers. They need empathy, friendliness, professionalism in their speaking and attitude while interacting with others.

KEY WORDS: indispensible, dominant, pleases, imperative, fanciful

I. INTRODUCTION:

A large number of students enter the job market with an Engineering Degree every year. With limited number of opportunities, communication and language skills play a key role in increasing the employability of these candidates. Besides, the use of English has extended to all spheres of present day living. The primary objective of this paper is to prepare the professional students to use effectively and

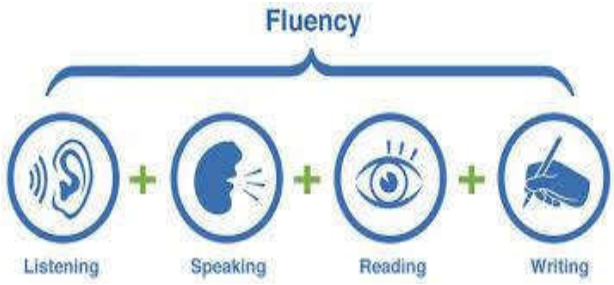
communicate confidently, especially in the context of engineering courses.

Objectives:

- Educate students in both the artistry and utility of the English language through the study of hands on learning through tasks, keeping theory based teaching to the minimum i.e. stressed more in the Text Book prescribed for engineering students throughout the country in the current academic year 2019-20.
- Students should be able to identify, analyze, interpret and describe the critical tasks, values, and themes that appear in literary and cultural texts and understand the way these ideas, values, and themes inform and impact culture and society, both now and in the past.
- Students should be able to ethically gather, understand, evaluate and synthesize information from a variety of written and various tasks in the Text Book, English for Engineers.
- Students must realize and adopt the policy of listening first anything next, then only they become good speakers. .

Communication skills are not only needed in day to day personal life, but also required at workplace and in professional life. We often find the certain situations which are challenging to handling, this is where having best communication skills become handy. Depending on the nature of our profession, we work in a team or interact with customers or other people.

"**I remind myself every morning: Nothing I say this day will teach me anything. So if I'm going to learn, I must do it by listening." – Larry King**



Every good communicator stresses on the importance of listening. With this basic lesson, let the professional students learn more to enhance their communication skills. Being successful at educational institution, workplace and in professional life with best communication skills make them progressive lifelong.

Let's get all the basics sorted first which provide skills for having best in communication, We can use these skills when we interact people, at workplace, in any profession and dealing with customers and others in professional life..

The one thing every great communicator does is start from scratch. Nobody is born great. We have to start from somewhere. It is best to start with basics. Understand what communication is and how we can effectively say what we intend to.

These are kinds of skills which are mentioned below. One great example is Steve Jobs' communication and negotiation style; he is regarded as someone who had the best presentation and negotiation skills in professional life. One of the great instances of having the best communication skills was the success of **Steve Jobs, Elon Musk** and others, although it's not the only factor which makes them successful, but definitely it's one of it.

11 ways to make the professional students competent in communication skills

1. Practice makes a student stand out of the crowd

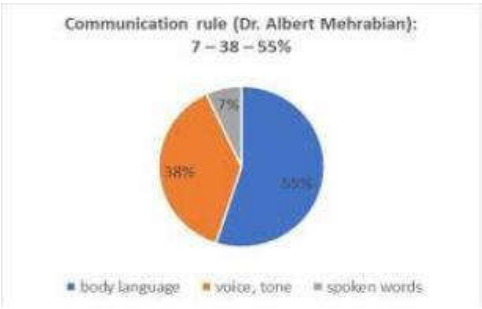
Pretty old but yet valid, this can take us a long way. The best approach is to practice it a lot. Whatever a student intends to do, let him rehearse it. While practicing, the faculty'll be able to assess students' performance.

2. Coordinate body and words

It is highly imperative that body says whatever we are saying. Body language including gestures and overall posture must be reflecting what we are trying to communicate. It is very unsatisfying if our body and words don't coordinate.

3. Maintain eye contact

Eye contact also has a great value. When we maintain eye contact with audience while communicating with them, it reassures that we are honest and sincere. Audience tends to believe us more when we maintain eye contact with them. Body language comprises more while speaking with any one on any occasion.



4. Speak slowly

It literally doesn't mean that we bore the audience with our low pitch and drooling speed. We just have to ensure that our speed is balanced and people can clearly listen each word we are saying.

5. Engage the listener

Engaging the listener means communicating in such a manner that people are interested in our expression. This is essentially important if we want to become an exceptional communicator.

6. Being a listener first

Listening helps us to understand what makes people listen. When we finally figure it out, we'll be able to make people listen to ours. Listening is the focus of every communication as it has a unique value in making us great communicators. Listening completely prepares us for answering in an effective way.

7. Tell stories (real ones)

Nothing gets the audience like stories and meaningful examples. We totally sell it when we tell a story. People listen to us more carefully and they become more interested. However, don't tell the fiction because when we tell real life stories and examples people understand that we are experienced and know what we are saying.

8. Let students participate

Be a friendly person who never gets offended when people ask questions. This not only makes the people interested but we get to learn and people value more. Nothing can prove our authenticity like open question and answer session.

9. Polish it

At this stage we finally give that pro touch that differentiates us from all mediocre conversations. Remember that we can't reach this stage without working on basics. Polishing is only required if we have certain skills.

10. Use humor

Humor is important if we want to sell our stories. Humor helps in impressing listeners. Humor validates our stories and polishes our existing skilsl. We should never worry to be a little clever and use humor. We'll shine more with humor.

11. Maintain positivity

This comes with great smile and exceptional attitude. People should feel comfortable and motivated when talking to us because we have this great attitude named positivity.

Strategic teaching techniques for effective communication skills for professional students.

- **Motivation:** Motivated students are an asset to an educational institution. Effective communication centers round the usage of words, speed of delivery of words, pitch modulation and body language. Using the right tools to communicate the right messages at the right time can salvage a crisis and motivate students to work towards success. Motivated students ensure not only the smooth and efficient functioning of project work but also increased congenial relationships with others.

- **Raising Morale** – Morale means "the capacity of a group of people to pull together persistently and consistently in pursuit of a common purpose". It is the product of motivation, which leads to zeal for action. The morale of the students fluctuates time to time. The faculty should therefore use effective communication to keep their morale high.

- **Inculcating the habit of Managerial efficiency**: - Communication helps in smooth operation of management. Managerial task can only be performed when communication system is effective.

- **Better decision**: – The success of any professional student can be measured in better decision. When the information, data and other facts are not effectively communicated, it hampers the decision making. So, when the facts are communicated to concerned peers, educational establishments and related persons. It is easy to make decisions promptly.

- **Removing controversies**- Effective communication allows smooth functioning that results conflict, controversies and disagreement can be resolved easily in students' professional as well as personal life.

Final word

There is always a room for improvement when it comes to communication skills. Thus make sure that we never stop taking these skills to the next level of improvement.

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A REVIEW ON NANO PARTICLES, THEIR PHASES AND HEALTH EFFECTS.

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ABSTRACT:

This study observes that Nano material's are an active of research but also an economic sector which addresses many application domains in various fields. Nano materials are chemical substances that are engineered with particle sizes between 1 to 100 nanometers in at least one dimension. It can be established that engineered nano materials derive many functional advantages from their unique properties. Free nano particles are formed through various process like breaking down of larger particles or by controlled assembly processes. Man made nanoparticles engineered to have the different desired size, desired chemical composition, different surface nature in solid phase and charge properties can be produced in the liquid phase mainly through controlled chemical reactions. The main nature of formation of nanoparticles in the gas phase is by a chemical reaction in which gases are converted into tiny liquid droplets, followed by condensation and growth. Natural phenomena and many human industrial and domestic activities, manufacturing or road and air transport release certain amount of nanoparticles into the atmosphere, In advance Nano particles are used in Technological applications with magnetic storage, electro communications ,microwave devices and Medical applications such as drug delivery systems .This paper addresses in particular difficulties in defining these materials,the state of knowledge on human or environmental toxicity and agencies in change of safety.

KEYWORDS : Nan Materials, Nano Particles, Phases, toxicity, Applications.

I. INTRODUCTION:

Nanomaterial's and nano manufactured goods represent areas of scientifiic research and industrial application in full expansion. They are already an industrial and economic reality. As far as industrial sectors, the introduction of these products should be considered in terms of potential effects of toxicity and other material[1]. Free nanoparticles are formed through either the breaking down of larger particles or by controlled assembly processes.Natural phenomena and many human industrial and domestic activities, such as cooking,

manufacturing or road and air transport release nanoparticles into the atmosphere[3].
In recent years, nanoparticles intentionally engineered for advanced technologies and consumer products have become a new source of exposure. At present it is not clear just how significantly human exposure to these engineered nanoparticles has increased, be it in the workplace, or through the use of nanotechnology-based products [4].

II. DEFINITION OF NANOMATERIAL'S

"Nanotechnology - terminology and definition for the "Nano objects", i.e. Nanoparticle, nanofiber and nano plate", namely:

(i) nano- definition considered the range of dimension between 1 and 100 nm.

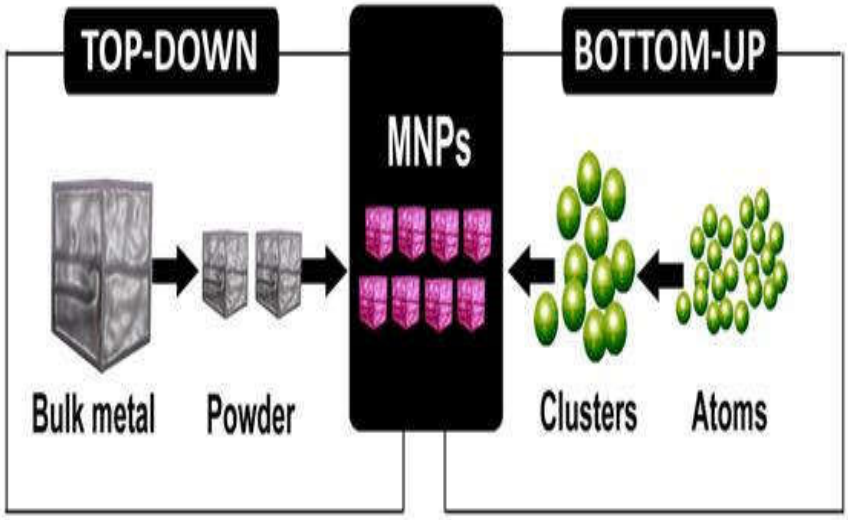
(ii) nano- objects are material with one, two or three external in the nano- domain dimension. Among these nano objects, nanoparticles include their three dimensions in the field of Nano; nano- oplates have one Nano sized dimension[2]

''Nanomaterial: means a material that meets at least one of the following criteria:

(i) Consists of particles ,with one or more external dimensions in the size range 1 nm- 100 nm for more than 1% of their number size distribution.

(ii) May have internal or surface structures in one or dimensions in the size range 1 nm-100 nm.

There are two approaches for the manufacturing of nanomaterials:



- The " **top-down** " approach involves the breaking down of large pieces of material to generate the required nanostructures from them. This method is particularly suitable for making interconnected and integrated structures such as in electronic circuitry.In the " **bottom-up** " approach,

single atoms and molecules are assembled into larger nanostructures. This is a very powerful method of creating identical structures with atomicprecision, although to date, the man-made materials generated in this way are still much simpler than nature's complex structures [5-7].

Sources of free nanoparticles:

Nanoparticles are formed through the natural or human mediated disintegration of larger structures or by controlled assembly processes. The associated processes occur either in the gas phase, in a plasma, in a vacuum phase or in the liquid phase, eventually followed by the intentional or unintentional transfer into one or more relevant fluid media and then to an individual receptor in an exposure setting [8-10].

Formation of nanoparticles in the liquid phase

Defined bottom-up production of nanoparticles in the liquid phase with respect to particle size, chemical composition, surface and charge properties occurs mainly through controlled chemical reactions (Frens 1973), and self limiting self assembly processes have evolved by controlling growth conditions. In view of the ecological cycling of nanomaterials, some emphasis has to be given to the corrosion and disintegration of bulk materials, where little knowledge is currently available (Oberdörster G et al 2005]. Naturally occurring processes generating nanosized structures in the liquid phase include erosion and chemical disintegration of organic (plant or microorganism debris) or geological (e.g. clays) parent materials. In all these types of disintegration process, the surface properties and their change through chemical reaction are critical in determining whether individual nanoparticles will be formed in the respective medium [11-14].

Formation of nanoparticles suspended in the gas phase

The main route of bottom-up formation of nanoparticles in the gas-phase is by a chemical reaction leading to a non-volatile product, which undergoes homogeneous nucleation followed by condensation and growth. Recently, this has become an important pathway for the industrial production of nanoparticle powders, which may be of metals, oxides, semiconductors, polymers and various forms of carbon, and which may be in the form of spheres, wires, needles, tubes, platelets or other shapes. This is also the unintentional pathway by which nanoparticles are formed following the oxidation of gas-phase precursors in the atmosphere, in volcanic plumes, in natural and man-made combustion processes, or in fumes associated with any man-made process involving volatilizable material at elevated temperature, such as welding or smelting, polymer fabrication, or even cooking .

As with the liquid phase case, disintegration processes of parent materials provide a pathway which only leads to nanoparticles suspended in the gas phase under special conditions. While in the liquid phase the presence of emulsifying agents accompanying an erosion or chemical disintegration process could support the suspension process, the dispersion of nanoparticles into a gas from liquid emulsions or dry powders is severely

limited by the strong adhesive forces between individual nanoparticles[15]. Therefore, any mechanically induced stress on the parent material mostly leads to particles in the micrometer range and above. Only under accidental conditions, e.g. in the case of uncontrolled release of a powder or an emulsion from a highly pressurized vessel could strong shear forces overcome these adhesive forces (Reeks and Hall 2001). In contrast, the spraying of liquids containing nanoparticles or soluble material at very low concentrations, followed by drying of the solvent, can lead to the resuspension of nanoparticles or to the formation of new nanoparticles from the solutes. This can lead to redistribution of nanoparticles, biological material or toxic substances into nanoparticulate airborne form[16].

The Sources of airborne nano particles:

In ambient air, the number of nanoparticles can be surprisingly similar in urban and rural areas, with as much as one million to one hundred million nanoparticles per litre of air depending on conditions.

In rural areas, nanoparticles are the product of chemical reactions involving compounds emitted by living organisms or by human activities such as wood burning.

In urban areas, most nanoparticles come from diesel engines or cars with defective or cold catalytic converters

In urban areas, the primary sources of nanoparticles are diesel engines or cars with defective or cold catalytic converters. Particularly, high-speed road traffic produces high numbers of nanoparticles of very small size.

In some workplaces, airborne nanoparticles may represent a potential health risk[17]. It is unlikely that nanoparticles would be released during manufacture because processes that generate them are often performed in closed chambers. Instead, exposure to nanoparticles is more likely to happen after the manufacturing process itself, or as a result of leaks arising from improper sealing. It is important to bear in mind that smaller nanoparticles remain airborne for longer periods of time than larger particles

III. OCCUPATIONAL SOURCES OF AIRBORNE NANOPARTICLES

Inhaled nanoparticles may represent a potential health risk. Aerosols in workplace environments may be derived from a wide variety of sources, depending on the type of activity and processes taking place. Nanoparticle aerosols arising from mechanical processes (e.g. the breaking or fracture of solid or liquid material) are unlikely to be formed. Grinding and surface finishing typically releases micrometre and submicrometre particles, possibly down to 100 nm but rarely below this. Most plasma and laser deposition and aerosol processes are performed in evacuated or at least closed reaction chambers. Therefore exposure to nanoparticles is more likely to happen after the manufacturing process itself, except in those cases of failures during the processing

(Luther 2004). In processes involving high pressure (e.g. supercritical fluid techniques), or with high energy mechanical forces, particle release could occur in the case of failure of sealing of the reactor or the mills. Nanoparticles exhibit increased diffusivity with decreasing size and therefore show delayed sedimentation in the earth's gravitational field, which translates into potentially increased lifetimes for nanoparticulate impurities at low concentration. In the presence of larger microparticles, as with the wide size distribution in aerosols such as smoke, the highly diffusive character of nanoparticles may lead to faster agglomeration or impaction on the larger particles. Furthermore, many particles, including metallic particles, are highly pyrophoric and there is a considerable risk of dust explosions.

IV. CHARACTERISTICS OF NANOPARTICLES ARE RELEVANT FOR HEALTH EFFECTS:

Toxicology of Nanoparticles:

Studies specifically dealing with the toxicity of nanoparticles have only appeared recently and, although now emerging in the literature, are still rare. Data concerning the behaviour and toxicity of particles mainly comes from studies on inhaled nanoparticles[18-20].

Health implications of nanoparticles used as drug carriers:

Particles for Drug Delivery

Carriers for Drug Delivery

Nanostructures and nanoparticles can be used for drug delivery purposes, either as the drug formulation itself or as the drug delivery carrier Current research focuses on cancer therapy, diagnostics and imaging, although many challenges still need to be solved .In addition, nanostructures are being investigated for gene delivery purposes Many different formulations involving nanoparticles have been used for drug delivery purposes, including albumin , poly(D,L-lactic-co-glycolide)acid (PLGA) (Panyam et al 2002, Weissenbock et al 2004), solid lipid formulations , cetyl alcohol/polysorbate nanoparticles ,hydrogels ,gold , polyalkylcyanoacrylate composites, magnetic iron oxide methoxy poly(ethylene glycol)/poly(ε-caprolactone) and gelatin . Albumin nanoparticles are already the subject of clinical studies for anticancer drug delivery purposes .

The use of nano particles as drug carriers may reduce the toxicity of the incorporated drug,although discrimination between the drug and the nano particle toxicity cannot always be made.The structure and properties of gold nanoparticles make them useful for a wide array of biological applications. Toxicity, however, has been observed at high concentrations using these systems. Goodman et al (2004) demonstrated that for 2 nm gold particles cationic particles were moderately toxic, whereas anionic particles were relatively non-toxic. Such very small sized gold nanoparticles were found to be non toxic when administered to mice for tumour therapy[21-23].

V. NANO SAFETY SUBSTITUTION

It means:

1) Replace toxic substance by less toxic substances,

2) Change the physical nature of the material,

3) Change the type of application: this approach relates to the replacement of an application in powder or liquid spray by an application in liquid phase,

4) Eliminate nanoparticles as soon as they are no longer necessary,

5) Favor forms which are non - dispersible in atmosphere including suspension in liquid or Use masters-mixtures.

VI. TECHNOLOGIES

This means implementing technical protection measures that are designed, as well as possible, to establish a barrier between workers and potentially dangerous substances or processes. Thus one effectively eliminates hazard exposure[24-25].

The following approach should be assessed

1) Use closed systems,

2) Use unbreakable containers or double containers for storage and transport,

3) Manufacture and use the substance on a form which limits its dispersion,

4) Capture pollutants at emitting source,

5) Air filtering prior to release,

6) Separate work premises and adapt ventilation of the premises

CONCLUSIONS

All of the country available studies, in vivo and in vitro; highlight the existence biological effects of nanomaterials in terms of functional, inflammation, modulations at cellular level for whole body. Still, little data are currently available, and it seems urgent to deepen existing awareness on the mechanisms involved in the dispersal of nanomaterials in the body. The risk assessment must not only take into account, but also their behavior and all of their life cycle.

Moreover, it is essential to know levels and situations of exposure, and therefore the condition of manufacture and composition of the products containing nanomaterials. In the absence of regulatory obligation, industrialists are very reluctant to communicate this information. In addition, epidemiological surveillance of workers exposed to nanomaterials should contribute decisively to the improvement of knowledge about their health effects possible medium and long term.

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SURFACE MODIFICATION OF BRASS FOIL

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ABSTRACT

A copper-based alloy is which the main additive is zinc (up to 50 percent). Brass is an alloy of copper and zinc. It has good hot and cold pressure workability, excellent mechanical properties, attractive color, and relatively low cost [1]. Brasses are resistant to corrosion in many media. Brasses are particularly susceptible to corrosion by solutions containing ammonia or amines. Alloys with more than about 15% of zinc may suffer dezincification, which leaves a weak, porous corrosion deposit of copper. Stress corrosion cracking, particularly by ammonia and amines, is also a problem with the brasses. Alloys containing more than about 15% zinc are most susceptible. Use of the annealed temper, and annealing or stress relieving after forming, reduces susceptibility to stress corrosion cracking. We have different types of brass materials like alpha, alpha-beta, beta and white. Classification of brass is depending upon the composition of copper and zinc. In this project the structure of untreated brass foil and brominated brass foil is studied. Here we used different experimental techniques like Energy Dispersive X-ray Spectroscopy (EDS), x-ray Diffractometer and field emission scanning electron microscope. Elemental composition is known by EDS data, structure of foil is known by XRD data [3], FESEM produces clearer, less electrostatically distorted images.

KEY WORDS:

Brass foil, crystal structure, Energy Dispersive x-ray Spectroscopy (EDS), X-ray Diffractometer and Field Emission Scanning Electron Microscope.

I. INTRODUCTION:

Classification of brasses: different types of

Class	Copper (%)	Zinc (%)	Notes
Alpha brasses	>65	<35	Alpha brasses are malleable, can be worked cold, and are used in pressing, forging, or similar applications. They contain only one phase, with cubic crystal.
Alpha-beta brasses	**55–65**	**35–45**	**Also called duplex brasses. Suited for hot working. It contains both α and β' phase; the β'-phase is body-centered cubic and is harder and stronger than α. Alpha-beta brasses are usually worked hot.**
Beta brasses	50–55	45–50	Can only be worked hot, and are harder, stronger, and suitable for casting.
White brass	<50	>50	Too brittle for general use. The term may also refer to certain types of nickel silver alloys as well as Cu-Zn-Sn alloys with high proportions (typically 40 %+) of tin and/or zinc, as well as predominantly zinc casting alloys with copper additive.

The classification is clearly explained in this table.

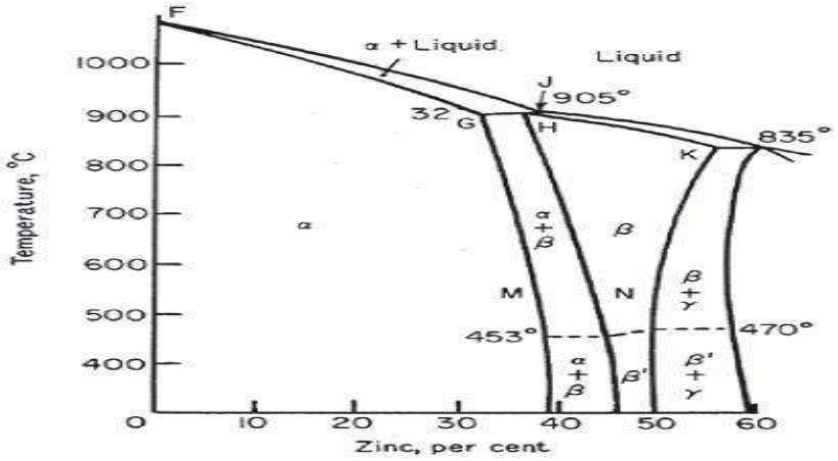

Fig. Phase diagram of Brass

The phase diagrams [5] of the different types of brasses are demonstrated in the following image.

In this phase diagram [5], α- phase is FCC,

β &β' are BCC, γ is a complex structure.

II. EXPERIMENTAL TECHNIQUES:

Various techniques were used to study the different properties of the material while doing the project. These techniques include X-ray Diffractometer (XRD) to determine the structural properties, field emission Scanning electron microscope (FESEM) and Energy Dispersive X-ray
Spectroscopy (EDS). In this chapter each of the above techniques is explained briefly.

2.1.Energy Dispersive X-ray Spectroscopy (EDS)

EDS identifies the elemental composition of materials imaged in a Scanning Electron Microscope (SEM) for all elements with an atomic number greater than boron. Most elements are detected at concentrations on the order of 0.1%.

2.2. Principle of Operation of SEM:

As the electron beam of the SEM is scanned across the sample surface, it generates X-ray fluorescence from the atoms in its path. The energy of each X-ray photon is characteristic of the element which produced it. The EDS microanalysis system collects the X-rays, sorts and plots them by energy, and automatically identifies and labels the elements responsible for the peaks in this energy distribution.

The EDS data are typically compared with either known or computer-generated standards to produce a full quantitative analysis showing the sample composition.

2.3. X-RAY DIFFRACTION:

The properties of a material can often be linked back to the arrangement of atoms in its crystal structure. X-ray diffraction [3] is a non-destructive analytical technique which can yield the unique fingerprint of Bragg reflections associated with a crystal structure.

One can regard a crystal structure as being built of layers, or planes, which each act as a semi-transparent mirror. X-rays with a wavelength similar to the distances between these planes can be reflected such that the angle of reflection is equal to the angle of incidence. We call this behavior `diffraction´ and it is described by Bragg's Law.

$$2d\sin\theta = n\lambda$$

When Bragg´s Law is satisfied, constructive interference of diffracted X-ray beams occur and a `Bragg reflection´ will be picked up by a detector scanning at this angle. The positions of these reflections tell us about the inter-layer spacing of atoms in the crystal structure, thanks to Bragg´s Law. Peak intensities give information about how much X-ray scattering is contributing to that reflection.

2.4. Field Emission Scanning Electron Microscopy (FESEM):

Principle of Operation:

A field-emission cathode in the electron gun of a scanning electron microscope provides narrower probing beams at low as well as high electron energy, resulting in both improved spatial resolution and minimized sample charging and damage. For applications which demand the highest magnification possible, we also offer In-lens FESEM.

Why Field Emission SEM?

- FESEM produces clearer, less electro statically distorted images with spatial resolution down to 1 1/2 nm. That's 3 to 6 times better than conventional SEM.
- Smaller-area contamination spots can be examined at electron accelerating voltages compatible with Energy Dispersive X-ray Spectroscopy.

Results and Discussions: EDS DATA

BRASS FOIL (NORMAL): TABLE 1

Element	Weight %	Atomic %
Cu K	60.66	61.34
Zn K	39.34	38.66
Total	100.0	

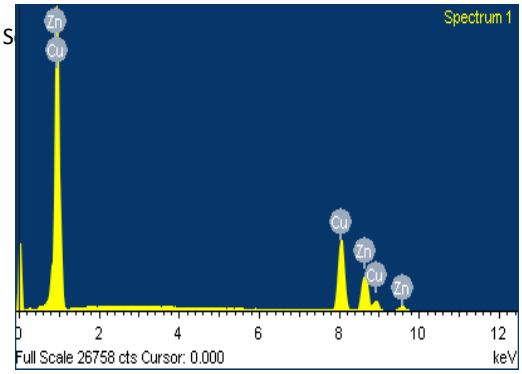

Fig1a:Shows the composition of cu and zn

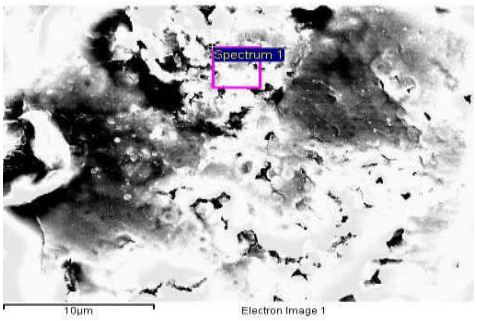

fig 1b: Shows the Morphology of Brassfoil

Element	Weight%	Atomic%
C K	3.12	12.67
O K	9.25	28.24
Ca K	0.71	0.86
e K	3.50	3.06
Cu K	4.68	3.60
Zn K	25.21	18.84
Br L	53.54	32.73
Totals	100.00	

Table 2: BROMINATED BRASS

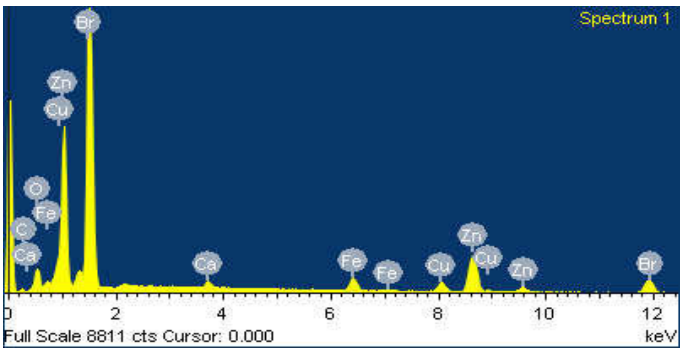

Fig 2a: shows the % of elements after bromination

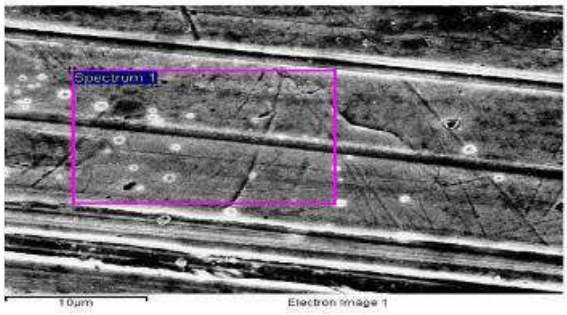

Fig: 2b Morphology of brominated brass

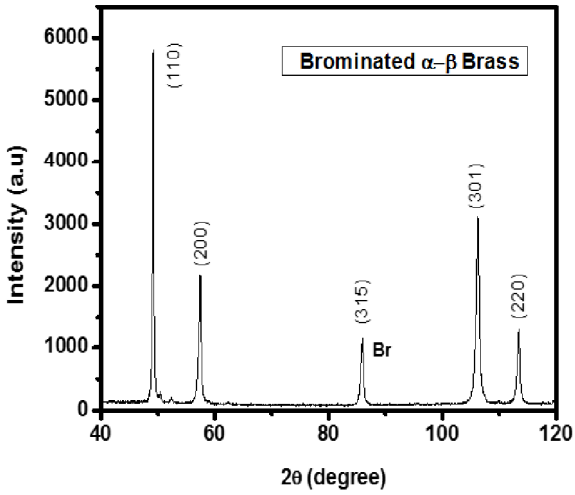

Fig 3b. XRDpattern of brominated α-β brass

Crystallite sizes and lattice parameters [4] found as 36 nm.

III. XRD data:[3] PURE BRASS & BROMINATED BRASS

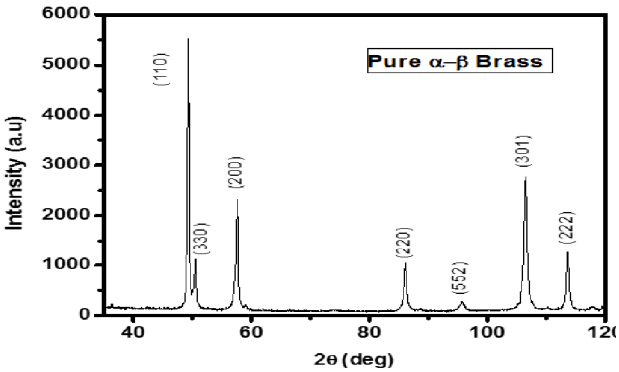

Fig 3a. XRD pattern of pure α-β brass

Clearly shows the α-β brass with cubic structure Crystallite sizes and lattice parameters [4] found as 27 nm.

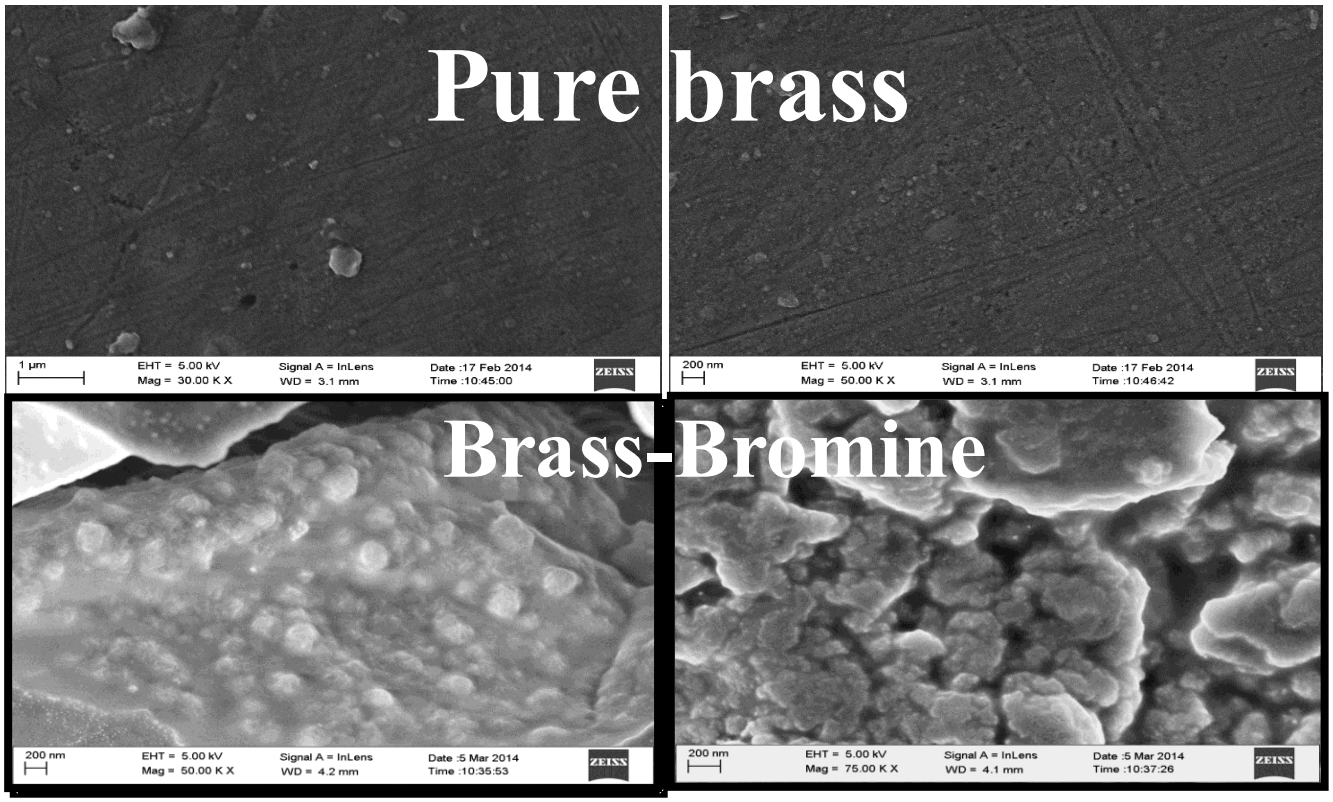

Fig 4. FESEM images clearly show s pure brass foil and brominated brass foil.

FESEM images of pure brass shows a microstructure with highly visible cracks in low and high magnification also but in case of bromine treatment we observed small cluster nanoparticles with 50-80 nm regimes. In figure Bromine brass shows very good image with clean morphology of nano-flake type morphology [6] with controlled dimension.

IV. CONCLUSIONS

The objective of the work in this project to modify the surface of commercial brass foil. Initial thickness of the brass foil is 0.4mm.To do this modification bromination technique was used. Initial structure of this foil without any treatment is cubic, after bromination structure changes to hexagonal.

From EDS data I deduced the composition of copper and zinc in the foil. From XRD, I knew the structure and crystallite size of my foil before and after treatment. From FESEM, I knew the morphology of my sample.

This preliminary work provides motivation for a detailed future study of structure, phase transition and phase stability of surface modified brass.

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ASSESSMENT OF INDUSTRIAL EFFLUENTS AND ITS IMPACT ON GROUND WATER QUALITY IN AND AROUND BALANAGAR, HYDERABAD,A.P, INDIA

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Abstract:
Due to rapid industrialization and overexploitation of the groundwater resources, there is a drastic change taking place in the Hyderabad urban environment. The present study area is Jeedimetla of Hyderabad, AP, India. The possible quality of the heavy metals major and trace elements in the hydrological system have been identified and quantified in the present study.

Depending on the environmental parameters, the trace metals and associated elements may form complexes and precipitate or become concentrated at several places. In the present study is an attempt made to evaluate the changes in the water quality of the Jeedimetla area.All trace elements, which include As, Se, B, V, Fe, Co, Pb, Cu, Zn, Cd, Mn, Ni, Mo, Ba, and Na, Mg, Si, Ca, Al, were analyzed using the highly sensitive inductively coupled plasma-mass spectrometer (ICP-MS). For most of the elements, the detection limits are around 1ppb.

Analytical data were processed with various computer programs for statistical evaluation. The impacts of natural and anthropogenic sources on the elemental concentration and the total area affected by each element have been deciphered using these graphs. The range and average concentrations of some of the trace elements of environmental concern in the Ground water.

The average concentrations are listed, and the world health organization (WHO) and minimum.National Standards (MINAS), Central pollution control board (CPCB) for water quality are also listed for comparison. Most of the trace elements show high concentrations (several orders of magnitude) in the groundwater of Jeedimetla in comparison to global average standards. Especially salts like Na, Ca, Mg, Se, are at peak levels and add turbidity to water and make it worst.

Key Words: environmental pollution, anthropogenic, irrigation practices, hydrogeochemistry

1. INTRODUCTION

Water is very vital for nature and can be limiting resource to men and other living beings. Without a well functioning water supply, it is difficult to imagine productive human activity be it agriculture or livestock. Water quality is influenced by natural and artificial effects including local industrial waste pollutants, geology and irrigation practices the hydrogeochemistry of water is important to quality in water supply planning for living areas. The geochemical character of any groundwater determines its quality and utilization. The quality is function of the physical, chemical and biological parameters

and it should be subjective, since which depends on a particular intended use.

The various on hydrogeochemistry of water quality have been carried out by various members. Laluraj et al.(2005) have been studied ground water chemistry of shallow aquifers in the costal zones of Cochin and concluded the ground water present in the shallow aquifers of some of the stations were poor in quality and beyond the potable limit as per the standard by World Health Organization (2004). Rapid increase of urbanization and industrialization leads to deterioration in hydrogeochemistry of ground water quality. Srinivas et al. (2000) and Jha and Verma (2000) have reported the degradation of the water quality in Hyderabad and Bihar, Respectively, Patnaik et al (2002) have studied water pollution generated from major industries similarly, waste pollutants or effluents. Discharged into streams may enter the aquifer body downstream. This also affects the ground water geochemistry. The studies on trace metals have been carried out (Jangir et al. 1990; Sharma et al.)Sharma et al (2004) Singh and Chandel (2003, 2006) pollution problems in ground water and industrial waste water have been studied. The specific objectives of the present study area 1) the investigations and interpretation of hydrogeochemistry of Jeedimetla and adjoining areas. 2) Find out the suitability of groundwater for irrigation and drinking purpose and 3) establish significant correlation among ton parameters of ground water samples.

Method

Balanagar area is located at Hyderabad city, in the NE of Andhra Pradesh state, is undergoing rapid urbanization and industrialization.

Groundwater samples collected from different hand pump, tube wells and ponds at 5 sampling points were analyzed. Samples were collected in good quality polythene bottles of 1-1 capacity. Sampling was carried out with out adding any preservatives in rinsed bottles for avoiding any contamination and brought to the laboratory. Only high pure (anal R Grade) chemicals double distilled water was used for preparing solutions for chemical analysis. Physical parameters like Ph, total dissolved solids, and electrical conductivity were determined at site with the help of digital portable analyzer kit. The samples collected and as per procedure (APHA 1995).

The total hardness (TH) in mg/l was determined by following equation (Todd 1980)

$$TH = 2.497\ Ca^{2+} + 4.115\ Mg^{2+}$$

Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
48.68	42.75	67.88	87.91	95.73

All the results compared with standard limits recommended by world health organization (WHO 2004).

2. AIMS AND OBJECTIVES:

- The present study area was undertaken with an objective to assess the quality of ground

water collected from Balanagar,Hyderabad,AP.

- To assess the quality of drinking water in the Balanagar .
- To determine various physic-chemical parameters in the water samples.
- To assess heavy metal concentrations in ground water and to locate the possible source of contamination.
- To study the impact of heavy metal pollutants on ground water and to know the health effects on the people living and using the water for different purpose.

3. MATERIALS AND METHODS:

METHODOLOGY

Sample collection

The total number of 5 sites were sampled during post-monsoon season (Feb 2013). Most of the water samples were collected from bore wells and acidified immediately to bring the pH of the solution to < 2.0. Clean polythene bottles of litre capacity soaked with 1:1 HNO3 and washed using detergent was used for groundwater sampling. These bottles were allowed to stand for several hours in double distilled water before taking to the field. The sample bottles were rinsed two to three times using the representative groundwater samples. Water samples were collected 30 cm below the water level in open wells using water sampler. Bore well water samples were collected directly from the pump sets. Since industrial pollutants contaminate the upper layer of soil, the samples were collected from wells that are being constantly used.

3. Sample preparation

All the samples were filtered in Whattman 42 filter paper and were diluted to 20 times for further analysis by ICP-MS. Care was taken to avoid contaminants to enter into the sample solution.

4. Sample analysis

Physical parameters of groundwater such as, pH and EC were determined in the field using digital meters immediately after sampling. Collected groundwater samples were transported to the laboratory on the same day. They were filtered using 0.45 microns Millipore filter paper and acidified wit[Abstract]h nitric acid (Ultrapore, Merck) for cations. For All trace elements (Li, Be, B, Si, V, Cr, Mn, Fe, Co, Cu, Zn, As, Se, Rb, Sr, Mo, Ag, Cd, Sb, Ba and Pb) were determined quantitatively by ICP-MS following Balaram (2003).

5. Instrumentation

A Perkin Elmer SCIEX, Model ELAN DRC II ICP-Mass Spectrometer (Concord, Ontario, Can-ada) was used throughout. The sample introduction system consisted of a standard Meinhard equalizer with a cyclonic spray chamber. All quantitative measurements were performed using instrument software. The software uses knowledge-driven routines in combination with nu-merical calculations to perform an automated interpretation of the whole spectrum. Several well-known isobaric interferences are programmed, and the corrections are automatically ap-plied.

Instrumental and data acquisition parameters are listed elsewhere (Balaram and Rao, 2003).

6. Calibration Strategies

In order to overcome matrix effects that are generally observed during the analysis of water samples, several methods can be used. Dilutions of the sample to bring down the total dissolved solids content to < 200 mg/L, use of internal standard for calibration etc., are effective for this purpose. By using alternative isotopes interferences can often be avoided, except for the mono-isotopic elements. NIST 1640 (certified reference material trace elements in natural water ob-tained from National Institute for Science and Technology, USA) was used to calibrate the sys-tem. The isotopes of measured elements in this work are free from potential polyatomic, iso-baric, and doubly charged ion interferences.

7. Sampling Area

The ground water samples from pumps were collected from the Balanagar, Hyderabad, Ap.

A total of 5 water samples were collected in presterilized bottles (schott duran et al. Germany)

And were stored at 2 to 4 degrees. The physicochemical properties such as hydrogen ion

Concentration (pH), total dissolved solids (TDS) in water sample were analysed on pH Bench top

Meter (Thermo electron corp. orion 5 star), using standard procedures. ICP-MS (perkin-Elmer

Sciex Elan drc II). ICP-MS is a type of producing ions (ionizations) with a mass spectrometer as a

Method of separating and detecting ions.ICP-MS is highly sensitive and capable of determination

Of a range of metals and several non-metals at concentrations

SAMPLING AREAS-TABLE 1.

S.NO	SAMPLE CODE	LOCATION AREA
1	SAMPLE 1	CITD, BALANAGAR
2	SAMPLE 2	NRSC, BALANAGAR
3	SAMPLE 3	IDS SCHOOL OF AUDITORIUM, BALANAGAR
4	SAMPLE 4	HAL AUDITORIUM, BALANAGAR
5	SAMPLE 5	BALAJI STEEL, BALANAGAR


Government of India
Department of Space
ISRO
NATIONAL REMOTE SENSING CENTRE
nrsc


हिंदुस्तान एरोनाटिक्स लिमिटेड
HAL
HINDUSTAN AERONAUTICS LIMITED

1. Tables and graphs

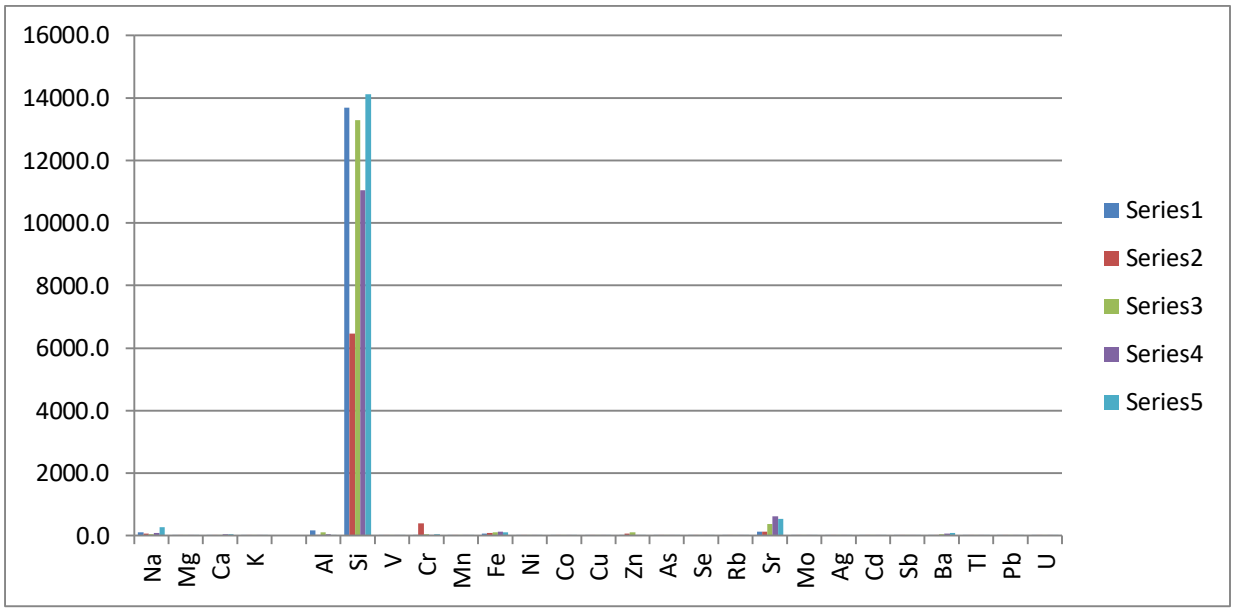
Table 1: Analytical data of major, minor and trace elements in groundwater samples collected from Balanagar, Ranga Reddy District, Andhra Pradesh.

ELEMENTS	unit	VA1	VB2	VC3	VD4	VE5
Na	ppm	111.3	52.69	41.85	83.82	257.6
Mg	ppm	6.241	5.766	15.66	25.51	24.06
Ca	ppm	10.35	11.11	24.88	33.09	35.71
K	ppm	1.625	1.341	1.400	1.286	1.591
Al	ppb	159.1	24.30	109.8	39.69	12.76
Si	ppb	13684	6454	13275	11044	14113
V	ppb	12.70	8.090	6.630	5.015	9.730
Cr	ppb	11.58	396.1	44.15	15.83	43.78
Mn	ppb	4.860	3.160	4.100	18.48	8.795
Fe	ppb	69.16	74.20	102.9	119.6	112.9
Ni	ppb	1.310	1.220	2.800	3.345	3.255
Co	ppb	0.175	0.095	0.265	0.425	0.775
Cu	ppb	6.770	19.51	12.75	7.745	19.92
Zn	ppb	11.63	65.77	104.5	17.76	25.28
As	ppb	1.420	1.255	0.710	1.150	2.695
Se	ppb	8.005	6.980	6.490	8.895	9.900
Rb	ppb	2.005	1.290	0.815	0.605	1.630
Sr	ppb	124.1	118.0	371.5	606.8	525.0
Mo	ppb	6.325	3.180	1.435	1.930	8.615
Ag	ppb	0.055	0.020	0.020	0.030	0.020
Cd	ppb	0.020	0.075	0.140	0.020	0.050
Sb	ppb	0.035	0.040	0.025	0.020	0.035
Ba	ppb	30.27	21.45	43.18	64.42	88.26
Tl	ppb	0.025	0.015	0.015	0.015	0.015
Pb	ppb	0.045	2.330	2.750	0.130	0.100
U	ppb	5.420	1.650	3.320	2.420	6.490

Table 2: Summary of the analytical data of major, minor and trace elements in groundwater samples collected from Balanagar, Ranga Reddy District, Andhra Pradesh

ELEMENTS	unit	min	max	mean	std	WHO	BIS
Na	ppm	41.85	257.6	109.4	87.17	<200	
Mg	ppm	5.766	25.51	15.45	9.407	<30	30
Ca	ppm	10.35	35.71	23.03	11.92	75	75
K	ppm	1.286	1.625	1.449	0.152		
Al	ppb	12.76	159.1	69.12	62.84	200	30
Si	ppb	6454	14113	11714	3170		
V	ppb	5.015	12.70	8.433	2.956		
Cr	ppb	11.58	396.1	102.3	164.9	50	50
Mn	ppb	3.160	18.48	7.879	6.302	500	100
Fe	ppb	69.16	119.6	95.74	22.82		300
Ni	ppb	1.220	3.345	2.386	1.044	20	
Co	ppb	0.095	0.775	0.347	0.269		
Cu	ppb	6.770	19.92	13.34	6.247	2000	50
Zn	ppb	11.63	104.5	44.98	39.41	3000	5000
As	ppb	0.710	2.695	1.446	0.746	10	50
Se	ppb	6.490	9.900	8.054	1.389		
Rb	ppb	0.605	2.005	1.269	0.574		
Sr	ppb	118.0	606.8	349.1	224.6		
Mo	ppb	1.435	8.615	4.297	3.074	70	
Ag	ppb	0.020	0.055	0.029	0.015		
Cd	ppb	0.020	0.140	0.061	0.050	3	10
Sb	ppb	0.020	0.040	0.031	0.008	50	
Ba	ppb	21.45	88.26	49.51	27.02	700	
Tl	ppb	0.015	0.025	0.017	0.004		
Pb	ppb	0.045	2.750	1.071	1.350	10	50
U	ppb	1.650	6.490	3.860	2.037	2	

GRAPH:



5. RESULTS AND DISCUSSION

Al:

ALLUMINIUM.In study area varys from 12.76 to 159.9with an average of 69.12.The permissible

limit of Al WHO 200 OR BIS 30. All the samples are exceeding the permissible limit except 2&5.

Si:

SILICON.In study area varys from 6454 to 14113 with an average Of 11714.The permissible limit of

Si WHO 0.05 .All the samples are exceeding the permissible limit. High Si in water Silicosis disease.

V:

VENEDIUM.In study area varys from 5.01 to 12.7with an average of8.43.The permissible limit

of V WHO 10. All the samples are below the permissible limit except sample1.

Cr:

CHROMIUM.In study area varys from 11.58 to 396.1 with an average of102.3.The permissible limit

of Cr WHO 50 OR BIS 50. All the samples are below the permissible limit except sample2.

Mn:

MANGANESE.In study area varys from 3.16 to 18.48with an average of 7.87.The permissible

limit of Mn WHO 500 OR BIS 100. All the samples are below the permissible limit.

Fe:

FERROUS.In study area varys from 69.16 to119.6 with an average of 95.74.The permissible limit of

Fe WHO 1-3 OR BIS 300. All the samples are below the permissible limit. High Fe in water cause siderosis.

Ni:

NIKEL.In study area varys from1.22 to 3.34 with an average of 2.38.The permissible limit of Ni

WHO 20. All the samples are below the permissible limit.

Co:

COBALT:In study area varys from0.09to 0.77 with an average of 0.34.The permissible limit of

Co WHO 0.2. All the samples are below the permissible limit except sample 4. . High Co in water

cause lazyness, headache, death.

Cu:

CUPPER:In study area varys from 6.77. to 19.92. with an average of 13.34.The permissible limit of

Cu WHO 1.5. All the samples are exceeding the permissible limit.

Zn:

ZINC:In study area varys from 11.63. to 104.5 with an average of 44.98.The permissible limit of Zn

WHO 500 OR BIS. All the samples are below the permissible limit.

As:

ARSENIC:In study area varys from0.71 to 2.69 with an average of 1.44.The permissible limit of

As WHO 10 OR BIS 50. All the samples are below the permissible limit. High As in water causes

cancer.

Se:

SELENIUM:In study area varys from 6.49. to 9.90 with an average of 8.05.The permissible limit

of Se WHO OR BIS.

Rb:

RUBIDIUM:In study area varys from0.60 to 2.005 with an average of 1.26.The permissible limit of

Rb WHO OR BIS.

Sr:

STRANICIUM:In study area varys from 118.0to 606.8 with an average of 349.1The permissible

limit of Sr WHO OR BIS.

Mo:

MOLYBDENUM:In study area varys from 1.43to 8.61 with an average of 4.29.The permissible

limit of Mo WHO OR BIS.

Ag:

SILVER:In study area varys from 0.02 to 0.055 with an average of 0.02.The permissible limit of

Ag WHO OR BIS 0.2. All the samples are below the permissible limit except sample 1&4 .

Cd:

CADMIUM:In study area varys from 0.02to 0.01 with an average of 0.06.The permissible limit of

Cd WHO 3 OR BIS 10. All the samples are below the permissible limit. High Cd in water Itai Itai

,anaemia diseases.

Sb:

ANTIMONY:In study area varys from 0.02 to 0.04 with an average of 0.03The permissible limit

of Sb WHO 50 OR BIS -.All the samples are below the permissible limit.

Ba:

BARIUM:In study area varys from 21.45 to 88.26 with an average of 49.51.The permissible limit of

Ba WHO 700 OR BIS-. All the samples are below the permissible limit.

Pb:

LEAD:In study area varys from0.45to 2.75 with an average of 1.07.The permissible limit of Pb

WHO 10 OR BIS 50. All the samples are below the permissible limit.

Tl:

TALIUM:In study area varys from 0.01to 0.02 with an average of 0.01.The permissible limit of

Tl WHO OR BIS.

U:

URENIUM:In study area varys from 1.65 to 6.49 with an average of 3.86.The permissible limit of

U WHO 2 OR BIS 5. All the samples are below the permissible limit except sample1&5

5. CONCLUSIONS

The groundwater in the area is generally alkaline in nature and the pH varies from 7.2 to 8.61. Based on the concentration of TDS, 11 samles are with in the *"permissible limits"* both for drinking and irrigation while the remaining 3 samples useful only for *"irrigation"*. Based on Wilcox's (1948, 1955) classification 4 samples fall in the fields of excellent to good, 9 samples that in good to permissible and one sample falls out side of the figure indicates that it is not useful for irrigation.

Classification based on SAR alone for irrigation suitability indicates that all samples are suitable for irrigation purpose.

According to USSL classification, most of the samples belong to C_2S_1 and C_3S_1 category suggesting that the Rangapur water is suitable for agriculture. The Gibbs diagram indicates that majority of the groundwater fall in the rock dominant field.

The quality of groundwater is controlled by lithology apart from other factors like land use pattern. Based on the above observations it is noticed that the groundwater in the present study area except few samples are suitable for both drinking and agriculture. But it is observed that the people are suffering with endemic diseases and agricultural crop production is declined drastically. Detailed study of trace elements is expected to unravel the suitability of the water of various purposes.

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EFFECTIVE COMMUNICATION IN MARKETING

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ABSTRACT: Marketing Communication emerges as a powerful tool that guides practitioners in developing and implementing marketing communications more consistently and effectively. Despite its continuing appeal little is known about its physical or visible form in marketing communication process, but the emergence of this concept has become one of the most significant examples of development in the marketing discipline. It is the most innovative function of marketing endorsed by advertising and marketing practitioners. Marketing Communication has moved beyond communication to the process of using promotional elements in a unified way so that a synergistic communication effect is created and achieved. The present study explore on the purpose of drawing out whether Integrated Marketing Communication could indeed be seen as an effort towards promotion in practice and also find out some challenges and future of integrated marketing communications for business.

I.INTRODUCTION:

Integration occurs when separate people or things are brought together, like the integration of students from all of the district's elementary schools at the new middle school, or the integration of snowboarding on all ski slopes. You may know the word differentiate, meaning "set apart." Integrate is its opposite. Marketing communication includes Advertising, Sales Promotion, Events and Experiences (sponsorship), Public Relations and Publicity, Direct Marketing, Interactive Marketing, Word-of-Mouth Marketing, Personal Selling. These tools of communication are collectively called as Marketing Communication Mix, concept of integrated marketing communications involves the solution of two interrelated problems: creating a system of communication messages using different communications tools that would not contradict each other, which would be coordinated among themselves, forming a single favorable image of the communicator; maximize the effectiveness of communications tools by searching for optimal various means. We made the conclusion that the use of an integrated approach reduces the costs of the company, since the integrated marketing communications carefully coordinates and mutually links the use of all elements of the marketing mix.

II. KEY WORDS:

Integrated Approach, Marketing Mix, Communications Tools, Integrated Marketing Communication, System of Communication, Communicator

III. MARKETING COMMUNICATIONS TOOLS:

Each marketing communications tool has certain advantages along with disadvantages, each tool has a specific purpose in terms of achieving the goals of product promotion, and therefore, the most effective way of promotion will be integrated marketing communication. It is integrated marketing communications that allows manufacturers to coordinate and strengthen their communications in order to achieve maximum impact Combining various marketing communications tools (MK) allows you to get a synergy effect when the combined use of individual marketing tools (MI) allows you to achieve a greater result than with their separate use. The synergy effect is achieved by combining the advantages inherent in each communications tools separately. Integrated marketing communications rebuilds marketing communications in order to see them as they are seen by the consumer - as the flow of information from a single source. Thus, the concept of integrated marketing communications involves the solution of two interrelated problems:

- Creating a system of communication messages using different communications tools that would not contradict each other, which would be coordinated among themselves, forming a single favorable image of the communicator;
- Maximize the effectiveness of communications tools by searching for optimal various means. The development of an integrated marketing communications strategy consists of nine steps:
- Assessment of the situation: identification of possible difficulties and opportunities. In assessing the situation, the main attention should be paid to factors affecting the effectiveness of marketing messages. Marketing communications can solve the problems of image, consumer attitudes, product perception or dissemination of information about it.
- Goal setting: communication goals can be planned with a focus on the impact of the strategy being developed on the consumer. The objectives of marketing communications usually consist of several categories:
  A) Creating awareness;
  B) Achieving understanding
  C) Ensuring changes in the relationship eniya to the product and its perception;
  D) achieving changes in consumer behavior
  D) Reinforcements of previous decisions.
- Target audience selection: within integrated marketing communications, target audiences are identified for specific communication activities. At the same time, the target audience is much wider than the target market. For example, the target toy market is mainly children. At the same time, their parents, grandmothers, etc. may also be included in the composition of their target audience
- The choice of marketing communications mix. Different kinds activities used to achieve marketing communication goals form a communication mix. Composition communications mix is selected individually for different market

segments and different market situations. Communication tools may include advertising media, sales promotion, PR, direct marketing, personal selling, etc.

IV. UNDERSTANDING THE MARKETING – COMMUNICATION:

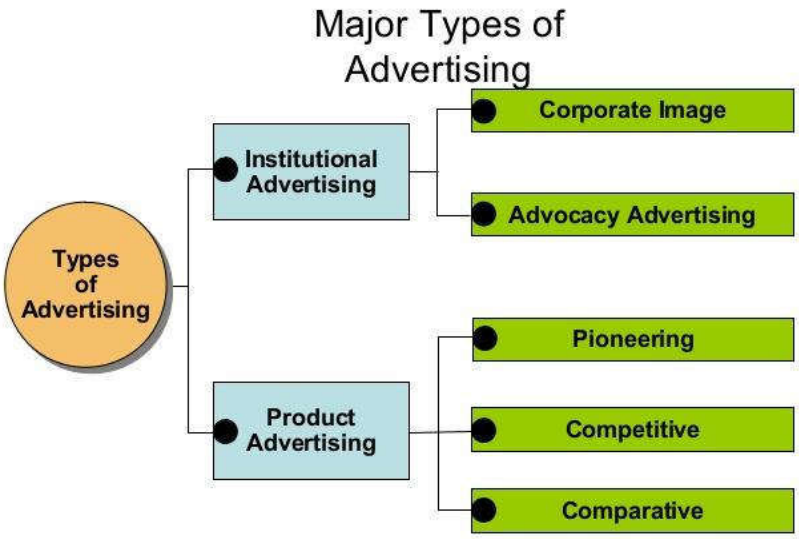
Positive effect on strengthening customer commitment. Recently there has been a tendency to reduce brand loyalty. This is due to the fact that the number of available goods is growing and at the same time sales promotion measures are activated. The unrestricted use of sales promotion measures ensures that even the most loyal consumers are beginning to expect special offers and lower prices from the company. Such excessive sales promotion creates for I companies have great difficulty in ensuring the commitment of customers to their brand name. In this case, the price factor becomes more important than the name factor of the manufacturer of the goods. Therefore, many companies use more complex marketing programs to strengthen consumer commitment to a particular brand than just advertising, such as direct marketing, public relations, organization of special marketing events, etc. New contacts are needed to implement bilateral contacts between the company and its target audience. Moreover, the initiative to establish contact can or should come directly from the consumer. In the near future, these types of communications will complement or even replace those types of mass communications that have been used in the recent past or are being used now. In this direction, many firms began to pay great attention to the use of the so-called relationship marketing relationship with the client). The use of relationship marketing allows you to identify current and potential customers of increased value and link them to the brand by providing each of them with special signs of attention.

Most company executives target marketing communications to meet the personal needs and desires of customers. Relationship marketing fits in well with integrated marketing communications, since a program to create strong customer relationships requires more than just advertising a product through the media. Its implementation requires the use of a fully integrated communication process. This should take into account the features of all types of marketing appeals and all aspects of the transfer of information about the company and its brand.

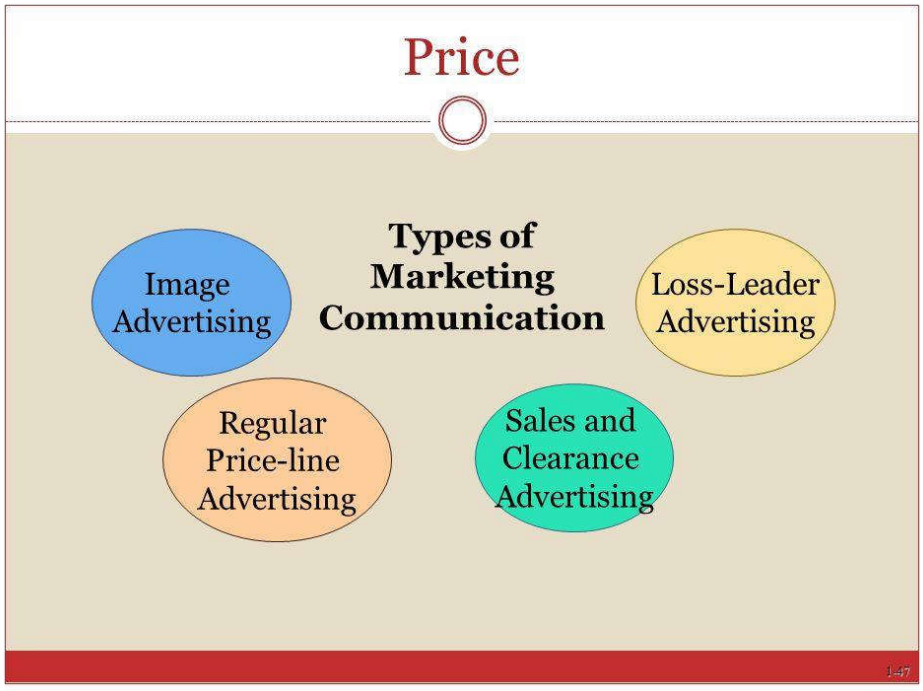
V. ADVERTISING AND INTEGRATED MARKETING COMMUNICATIONS

The following strengths of advertising: -

- Reach a mass audience stimulate large-scale demand;
- Give brand recognition
- Position the brand or product
- To expand knowledge of a particular brand
- Ensure repeatability of the treat men
- Serve as a reminder. Reveal the following weaknesses of advertising: -
- Advertising can be considered as something intrusive and, accordingly, it will try to avoid it can pollute the information environment
- It wastes a large part of its impact because of its mass orientation. Advertising should be used in the integrated marketing communications to maximize its strengths
- Taking into account other tools MK and with them.
- Advertising is very good when it builds brand image, appealing to a wide audience through the media.



VI. TYPES OF MARTKETING – COMMUNICATIONS



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TYPE OF PROMOTION	SENDER	ENCODING	TRANSFER MECHANISM	DECODING BY RECEIVER	RESPONSE	FEEDBACK
Personal selling	Canon Office Equipment	Sales presentation on new model office copier	Canon sales representative	Office manager and employees in local firm discuss Canon sales presentation and those of competing suppliers	Order placed Canon copier	Information that for customers are reacting positively to the message
Two-for-one coupon(sales promotion)	Wendy's Hamburgers	Wendy's marketing department and advertising agency	Coupon inserted in weekend newspaper	Newspaper reader sees coupon for hamburger and saves it	Hamburgers purchased by consumers using the coupon	Information that customers are reacting positively to the message
Television advertising	Movie producer	Advertisement for a new movie is developed by the producer's advertising agency	Network television during programs with high percentage of viewers in target market	Audience sees ad but few decide to go to the movie	Small number of movie tickets purchased	Communication failed to interest and motivate the target market

VII. CONCLUSION: Marketing is the most exciting of all business sports. It is the heartbeat of every successful business. It is continually changing in response to the explosion of information, the expansion of technology, and the aggressiveness of competition, at all levels and everywhere.All business strategy is marketing strategy. Your ability to think clearly and well about the very best marketing strategies, and to continually change and upgrade your activities, is the key to the future of your business. Product is considered as main element of the marketing mix, Price is understood through the value of the product which is paid by the buyer to purchase the product. Place or distribution strategy of marketing mix is concerned to make products accessible to customers at favorable time and place. The last element of marketing mix, promotion strategy is focused to various activities like publicity, public relations, sales promotion

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A STUDY ON MUTUAL FUNDS

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ABSTRACT:

Mutual funds mobilize the savings of the people and channelize it to the money and capital market. One of the main advantages of mutual funds over any other investment to small investor is that they give small investors access to professionally managed, diversified portfolio of equities, bonds and other securities, which is rather impossible for a small investor to create with a small amount of capital he/ she owns. Mutual funds constitute a very important component of the capital market in developed countries and are now becoming vibrant in emerging markets like India. The origin of mutual funds industry in India can be traced in the enactment of the Unit Trust of India (UTI) Act in 1963. Due to historic reasons, the UTI enjoyed the total monopoly in the initial years and until now continues to maintain the largest market share. The industry has now moved from complete monopoly to that of a monopolistic competition. Presently, the share of Net Assets of mutual funds is more than 7 percent of India's gross domestic product (GDP). Also, the monies accredited to mutual funds form an adequate part of gross domestic savings (GDS) in the country.

I.INTODUCTION:

Individual investors have developed keen interest within the capital market, attaining higher returns and capital gains in conjunction with transaction concessions. Since little or no investors typically haven't got adequate time, knowledge, expertise and resources for directly approaching the capital market, they have to believe associate intermediate that undertakes wise investment choices and provides the advantages of skilled experience. this is often what a investment company will. Mutual funds square measure dominated by SEBI. SEBI has the authority to issue pointers and to supervise and regulate the in operation of mutual funds through Mutual Funds rules, 1993 square measure amended from time to time. Mutual funds offer stability arid property to the exchange conjointly. An investment company could be a pool of investment managed professionally for the aim of buying varied securities and culminating them into a powerful portfolio which is able to supply enticing returns over and on top of the riskless returns that are presently being offered by the market. Investment company could be a money product that invests in stocks or bonds.

II. REVIEW OF LITERATURE

Literature on no depository financial institution performance analysis is massive. some analysis studies that have influenced the preparation of this paper well are mentioned throughout this section Sharpe,

C.Srinivas Yadav and Hemanth N C (Feb 2014) Have studied Performance of chosen Equity Growth Mutual Funds in India: associate Empirical Study throughout initial Gregorian calendar month 2010 To thirty initial would possibly 2013. The study evaluates performance of chosen growth equity funds in Asian nation, disbursed exploitation portfolio performance analysis techniques like Sharpe and Treynor live. S&P CNX corking has been taken as a results of the benchmark. The study conducted with fifteen equity growth Schemes (NAV) were chosen from high ten AMCs (supported AUM) for the quantity first June 2010 to thirty first could 2013(3 years).

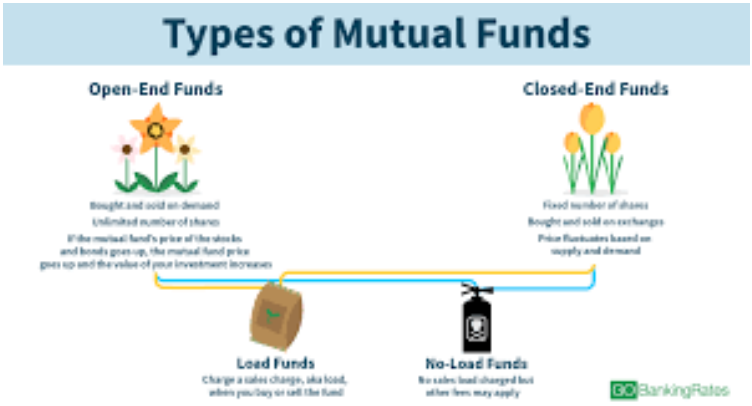
Mrs.V. Sasikala and Dr. A. Lakshmi (Jan 2014) Have studied The no depository financial organization Performance Between 2008 And 2010: Comparative Analysis. The paper entitled "comparative analysis of non depository financial institution performance between 2008 & 2010. The paper was undertaken to know the once meltdown amount risks and returns of 2008 high hundred mutual funds and compare with 2010 high hundred mutual funds open in Business recently. The analysis of alpha, beta, variance, Sharpe relation and R-squared ar declare high, low, average, on prime of average and below average of risks and square measure offered of funds.

Dr. E. Priyadarshini (2013) has done Analysis of the Performance of Artificial Neural web work Technique for prediction non depository financial institution web and Values. throughout this paper, Internet and Values of 4 Indian Mutual Funds were expected exploitation Artificial Neural Network once eliminating the redundant variables exploitation PCA and put together the performance was evaluated exploitation customary arithmetic measures like MAPE, RMSE, etc.

III. KEY TERMS:

Portfolio, Corpus, Diversified equity mutual funds, Balance fund, SIP, NAV

IV. TYPES:



1. Mutual Fund

A mutual fund is an investment security type that enables investors to pool their money together into one professionally managed investment. Mutual funds can invest in stocks, bonds, cash and/or other assets. These underlying security types, called *holdings* combine to form one mutual fund, also called a *portfolio*.

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2. Mutual Fund Loads

Loads are fees charged to the investor when buying or selling certain types of mutual funds .There are four types of loads: **Front-end loads** are charged up front (at the time of purchase) and average around 5% but can be as high as 8.5%.

3. Mutual Fund Share Class:

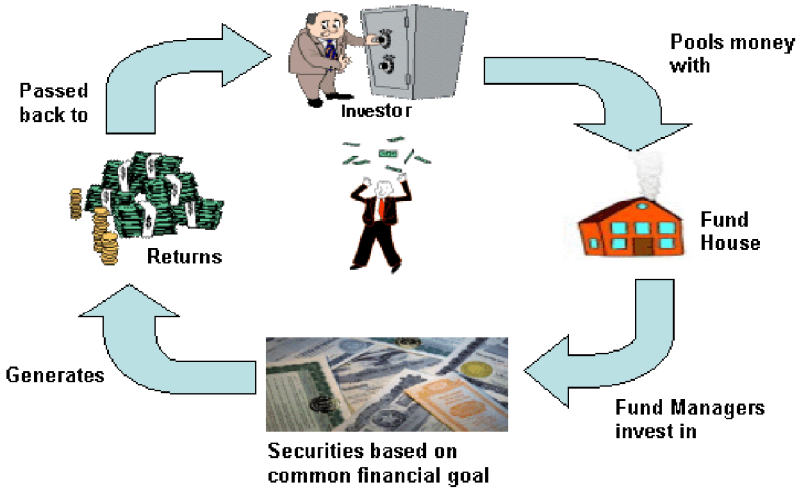
Each mutual fund has a share class, which is basically a classification of how the fund charges fees. There are several different types of mutual fund share classes, each with its own advantages and disadvantages, most of which center upon expenses.

- Class A shares are also called "front load" funds because their fees are charged on "the front" when the investor first buys shares of the fund. The loads typically range from 3.00% to 5.00%. A shares are best for investors who are using a broker and who plan to invest larger dollar amounts and will buy shares infrequently. If the purchase amount is high enough, investors may qualify for "breakpoint discounts."
- Class B Share Funds are a share class of mutual funds that do not carry front-end sales charges, but instead, charge a contingent deferred sales charge (CDSC) or "back-end load." Class B shares also tend to have higher 12b-1 fees than other mutual fund share classes.For example, if an investor purchases mutual fund Class B shares, they will not be charged a front-end load but will instead pay a back-end load if the investor sells shares prior to a stated period, such as 7 years, and they may be charged up to 6% to redeem their shares. Class B shares can eventually exchange into Class A shares after seven or eight years. Therefore they may be best for investors who do not have enough to invest to qualify for a break level on the A share but intend to hold the B shares for several years or more.
- Class C Share Funds charge a "level load" annually, which is usually 1.00%, and this expense never goes away, making C share mutual funds the most expensive for investors who are investing for long periods of time.The load is usually 1.00%. In general, investors should use C shares for short-term (less than 3 years).
- Class D Share Funds are often similar to no-load funds in that they are a mutual fund share class that was created as an alternative to the traditional and more common A share, B share and C share funds that are either front-load, back-load or level-load, respectively.

- Class Adv Share Funds are only available through an investment advisor, hence the abbreviation "Adv." These funds are typically no-load (or what is called "load-waived") but can have 12b-1 fees up to 0.50%. If you are working with an investment advisor or another financial professional, the Adv shares can be your best option because the expenses are often lower.
- Class Inst Share Funds (aka Class I, Class X, or Class Y) are generally only available to institutional investors with minimum investment amounts of $25,000 or more.
- Load-Waived Funds are mutual fund share class alternatives to loaded funds, such as A share class funds. As the name suggests, the mutual fund load is waived (not charged). Typically these funds are offered in 401(k) plans where loaded funds are not an option. Load-waived mutual funds are identified by an "LW" at the end of the fund name and at the end of the ticker symbol. For example, American Funds Growth Fund of America A (AGTHX), which is an A share fund, has a load-waived option, American Funds Growth Fund of America A LW (AGTHX.LW).
- Class R Share Funds do not have a load (i.e. front-end load, back-end load or level load) but they do have 12b-1 fees that typically range from 0.25% to 0.50%. If your 401(k) only provides R share class funds, your expenses may be higher than if the investment choices included the no-load (or load-waived) version of the same fund.

4. Expense Ratio

Even if the investor uses a no-load fund, there are underlying expenses that are indirect charges for use in the fund's operation. The expense ratio is the percentage of fees paid to the mutual fund company to manage and operate the fund, including all administrative expenses and 12b-1 fees. The mutual fund company would take those expenses out of the fund prior to the investor seeing the return. For example, if the expense ratio of a mutual fund was 1.00%, and you invested $10,000, the expense for a given year would be $100. However, the expense is not taken directly out of your pocket. The expense effectively reduces the gross return of the fund. Put differently, if the fund earns 10%, before expenses, in a given year, the investor would see a net return of 9.00% (10.00% - 1.00%).



5. Index Funds

An index, with regard to investing, is a statistical sampling of securities that represent a defined segment of the market. For example, the S&P 500 Index, is a sampling of approximately 500 large capitalization stocks. Index funds are simply mutual funds that invest in the same securities as its benchmark index. The logic in using index funds is that, over time, the majority of active fund managers are not able to outperform the broad market indexes. Therefore, rather than trying to "beat the market," it is wise to simply invest in it. This reasoning is a kind of "if you can't beat 'em, join 'em" strategy. The best index funds have a few primary things in common. They keep costs low, they do a good job of matching the index securities (called tracking error), and they use proper weighting methods. For example, one reason Vanguard has some of the lowest expense ratios for their index funds is that they do very little advertising and they are owned by their shareholders. If an index fund has an expense ratio of 0.12 but a comparable fund has an expense ratio of 0.22, the lower cost index fund has an immediate advantage of 0.10. This only amounts to only 10 cents savings for every $100 invested but every penny counts, especially in the long run, for indexing.

6. Market Capitalization

With investment securities market capitalization (or market cap), refers to the price of a share of stock multiplied by the number of shares outstanding. Many equity mutual funds are categorized based on the average market capitalization of the stocks that the mutual funds own. This is important because investors need to be sure of what they are buying. *Large-cap Stock Funds* invest in stocks of corporations with large market capitalization, typically higher than $10 billion. These companies are so large that you have probably heard of them or you may even purchase goods or services from them on a regular basis. Some large-cap stock names include Wal-Mart, Exxon, GE, Pfizer, Bank of America, Apple and Microsoft. *Mid-cap Stock Funds* invest in stocks of corporations of mid-size capitalization, typically between $2 billion and $10 billion. Many of the names of the corporations you may

recognize, such as Harley Davidson and Netflix, but others you may not know, such as SanDisk Corporation or Life Technologies Corp. *Small-cap Stock Funds* invest in stocks of corporations of small-size capitalization, typically between $500 million and $2 billion. While a billion-dollar corporation may seem large to you, it's relatively small compared to the Wal-Marts and Exxons of the world. A subset of small-cap stocks is "Micro-cap," which represents mutual funds investing in corporations with average market capitalization usually less than $750 million.

7. Mutual Fund Style

In addition to capitalization, stocks, and stock funds are categorized by style which is divided into Growth, Value or Blend objectives. *Growth Stock Funds* invest in growth stocks, which are stocks of companies that are expected to grow at a rate faster than the market average. *Value Stock Funds* invest in value stocks, which are stocks of companies that an investor or mutual fund manager believes to be selling at a price lower than the market value. Value Stock Funds are often called Dividend Mutual Funds because value stocks commonly pay dividends to investors, whereas the typical growth stock does not pay dividends to the investor because the corporation reinvests dividends to further grow the corporation. *Blend Stock Funds* invest in a blend of growth and value stocks. Bond funds also have style classifications, which have 2 primary divisions:

1) Maturity/Duration, which is expressed as long-term, intermediate-term, and short-term,

2) Credit quality, which is divided into high, investment grade, and low (or junk).

8. Balanced Funds

Balanced Funds are mutual funds that provide a combination (or balance) of underlying investment assets, such as stocks, bonds, and cash. Also called hybrid funds or asset allocation funds, the asset allocation remains relatively fixed and serves a stated purpose or investment style. For example, a conservative balanced fund might invest in a conservative mix of underlying investment assets, such as 40% stocks, 50% bonds, and 10% money market.

9. Target Date Retirement Funds

This fund type works like its name suggests. Each fund has a year in the name of the fund, such as Vanguard Target Retirement 2055 (VFFVX), which would be a fund best suited for someone expecting to retire in or around the year 2055. Several other fund families, such as Fidelity and T. Rowe Price, offer target date retirement funds. Here's basically how they work, other than just providing a target date: The fund manager assigns a suitable asset allocation (mix of stocks, bonds, and cash) and then slowly shifts the holdings to a more conservative allocation (fewer stocks, more bonds, and cash) as the target date draws closer.

10. Sector Funds

These funds focus on a specific industry, social objective or sector such as health care, real estate or technology. Their investment objective is to provide concentrated exposure to specific industry groups, called sectors. Mutual fund investors use sector funds to increase exposure to certain industry sectors they believe will perform better than other sectors. By comparison, diversified

mutual funds--those that do not focus on one sector--will already have exposure to most industry sectors. For example, an S&P 500 Index Fund provides exposure to sectors, such as healthcare, energy, technology, utilities, and financial companies. Investors should be careful with sector funds because there is increased market risk due to volatility if the sector suffers a downturn. Over-exposure to one sector.

Recommendations – Companies tie up:-

- Aditya Birla Sun Life Frontline Equity **Fund** (G)
- SBI Bluechip **Fund** G.
- Mirae Asset Emerging Bluechip **Fund** G.
- L&T India Value **Fund** (G)
- Kotak Select Focus **Fund** (G)
- ICICI Prudential Equity and Debt **Fund** G.
- ICICI Prudential Bluechip **Fund** G.
- Reliance Small Cap **Fund** (G)

CONCLUSION: Mutual funds are a popular investment avenue among investors, as they are easy to invest in and give higher returns as compared to other traditional asset classes such as FDs or saving bank deposits. Mutual fund business is one all told the fastest growing business in Republic of India and it's already established in foreign countries. Finance in mutual funds might be a heap of safe as compared to equity likewise as a result of it offer handsome returns. Supported differing types of equity and debt mutual funds the following conclusion area unit usually created.

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DECISION MAKING IN PLANT LAYOUT – PRODUCTION

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I. ABSTRACT: The study seeks to a Plant location refers to the choice of optimal place which is best or favorable at which production plant can be established such that efficiency and effectiveness can be maximized. It was decided by entrepreneur before establishing a new enterprise. The plant Layout refers to the physical arrangements of production facilities. It is the configuration of various departments work centers and equipments in the conversion process, this is floor plan of physical facilities, which are used in the production, these process depends in functional conditions, techniques, experience and scope of performance in future concern. It is a choice of the region where the men, materials, money, machines and equipments are bought to forward together for setting up a factory or business. Productivity is defined as a total output per one unit of a total input. In control management, productivity is a measure of how efficiently a process runs and how effectively it uses resources.

II. KEY WORDS: Operation Management, Layout, Facilities, Technology Obsolescence, Value Added Product / Services, Sub System, Buy or Make decision, Productivity

III. INTRODUCTION: Organization aims to promote its product among customers which helps to obtain substantial sales order, the term is communicated to the production subsystem which is concerned with the management of physical resources for the production of an item or provision of service. To manufacture a product as per the specifications, the production functions needs to organize its resources like raw materials, equipments, labour and working capital according to the predetermined production plan. Technology obsolescence may force some industries to use the phase in strategy for introducing the next model of same product or service to retain and improve its market segment. It is amply clear that all functional subsystem of any business organization are interwoven by many linkages. Production and Operations Management is the process which combines and transforms various resources used in the production / operation sub system of an organization into value added product / services in a controlled manned as per the polices of the organization. The set of

interrelated management activities which are involved in manufacturing certain products is called Production management.

IV. MATERIALS CLASSIFICATION:

For the selection of a location to start a production was divided into two types:-

(A) Ubiquities: The Raw materials include water, air, sand etc which is available everywhere which helps in the operational research by using " Model Driven Architecture" which contains core theme on " How to capture each kind of knowledge in a form that transferable , reusable, teachable and deployable."

(B) Localized Materials: The raw materials that are found in some specified locations

Ex: - Iron, coal, Bamboo, Wood etc

It was divided into two types

- Pure Materials
- Weight lose Materials

V. PRINCIPLES OF LAYOUT:

1. The Principle of minimum travel
2. The Principle of sequence
3. The Principle of usage
4. The Principle of compactness
5. The Principle of safety and satisfaction
6. The Principle of flexibility
7. The Principle of minimum investment

VI. FACTORS AFFETING PLANT LAYOUT:

→ Policy Management
→ Plant Location
→ Nature of the Product
→ Volume of Production
→ Geographical constraint – Transportation
→ Availability of floor space
→ Nature of Manufacturing process
→ Repair equipments and availability
→ Economical situation & Country constraint
→ Availability of Infra Structure

VII TYPES OF INDUSTRIES:

(A) Synthetic: Initiate from a Natural Product

In these type of industries several elements under go in production process to form a finished products (Two or more materials to form an output)

Ex: Chemical and Paper industry

(B) Analytical : Systematic, logical, methodology

It involves in conversion of raw material into different elements, raw material divided and sub divided into several useful units

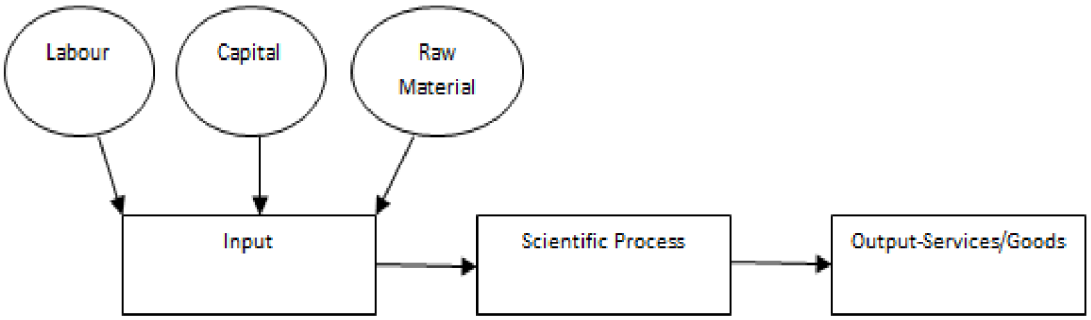
Ex: Oil refinery – Separates crude oil into Kerosene, diesel, petrol

(C) *Conditioning:* These industries to produce products with variable physical properties

Ex: Metal working industry

(D) Extractive : Such industries extract one element from the group of elements

Ex: Metal from ore



VIII LOCATION BASED ANALYSIS METHODS:

(A) Line Balance Procedure Method:

Line of **Balance** (LOB) **Line** of **Bal ance** (LOB) is a management control **process** for collecting, measuring and presenting facts relating to time (see Schedule Control), cost and accomplishment – all measured against a specific plan.

$$\mathbf{Xa} = \frac{\text{Sum of the task time}}{\text{Cycle time}}$$

(B) Centroid Method:

This method helps in business to identify the location of facilities used for manufacturing and other product related aspects. It is also called as Agglomerative Clustering Method.

$$X = \frac{\text{Sum of volume X Sum of Coordinators}}{\text{Sum of Volume per day}}$$

(C) Location Based Scoring Method:

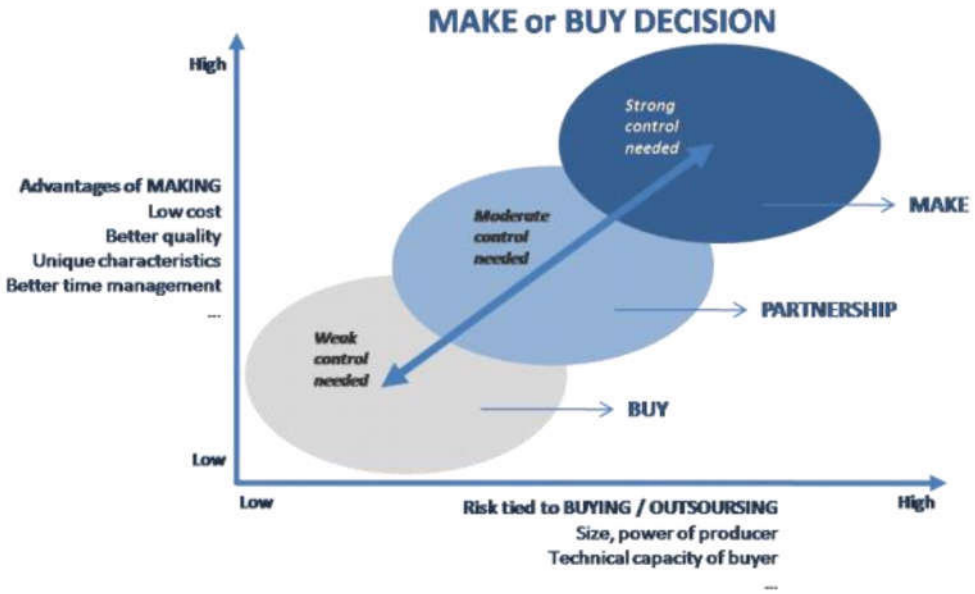
The scoring model is a quantitative analysis method that reveals relationships between several, difficult to compare key figures for locations, regions or areas. The goal is to derive indicators to aid in decisions regarding each location or area. These criteria in search with availability of Infra structure, Size of Market, Tax benefit concession – geographical constraints, availability of labour and resources etc.

IX. ECONOMIC ORDER QUANTITY:

Buy Opinion

It is very first step in process planning and it is the deciding factor whether the product or service made in an organization or should brought from others The make-or-buy decision is the act of making a strategic choice between producing an item internally (in-house) or buying it externally (from an outside supplier Issues like government regulation, competing firms, and market trends all have a strategic impact on the make-or-buy decision.

Make Opinion



Buy Decision = Q1= Economic order Quantity = $\sqrt{\frac{2C_oD}{C_c}}$

Total Cost = $D \times P + \frac{DCo}{Q1} + \frac{Q1 \times Cc}{2}$

Make Opinion = Q2= Economic Order Quantity = $\sqrt{\frac{2SD}{Cc(1-D/R)}}$

Total Cost = $D \times P + \frac{D \times S}{Q2} + Cc\,(R - D)\,\frac{Q2}{2 \times R}$

Where

D = Demand in the Year / Month/ Quarter

P = Purchase Price per Unit

Cc = Carrying Cost per unit in Year / Month/ Quarter

Co = Ordering Cost / Order

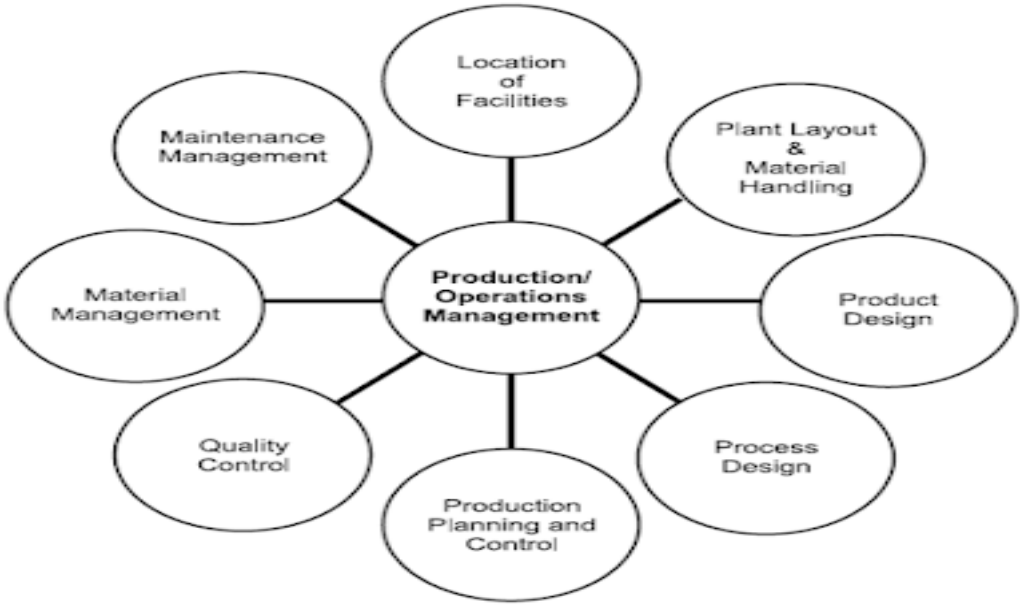
S = Set up time

EOQ = Economic Order Quantity

R = Production rate

Q1 = Economic Order Size – Buy

Q2 = Economic Production Size - Make



XI. RECOMMENDATIONS:

- Choosing the geographical constraint plays an important role in Production company
- Transportation is the criteria to make time and money saving process which was interlinked to geographical section
- Choice of owner depends on Buy or Make decision which provides result after the production
- Working out the decision making regarding Buy or Make should be performed with perfect margins then the industry will have best financial strength
- Grabbing familiar idea regarding Locating the problems (political, economical) issue (legal) , availability of labour (skilled and semi skilled), reducing the cost of production.
- The Company has indicated a low inherent risk regarding the appropriateness of the location of the flow meters whereas the verifier deems the risk to be higher requiring more robust control activities such as maintenance or better location on the inlet to the emissions sources.
- The `process activity` for enhancing human resource for the on board ship`s staff with regards to competency and training was found to be in sufficient.

X. CONCLUSION :

Choosing the best location for a which to apt a production / manufacturing industry it is crystal clear that to workout 360 degrees monitoring like transportation, labour availability, decision regarding make or buy a material to make product into finished goods. Effective and Efficient¬Strategic Implications regarding Competitive Priorities (regarding capacity, process, flexibility, cost, quality, customer, image. Layout will meet Firm's competitive requirements, which may results for customer relation management.

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Gender Discrimination and its Impact on Employee Performance at Work Place

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Abstract : This research paper explores the issue of gender discrimination in workforce and its impact on the satisfaction and motivation, commitment and enthusiasm and stress level of employees. Close ended questionnaire was administered from 526 males and females oflower, middle and higher category employees of public and private health and education departments of Hyderabad . Gender discrimination in workforce was measured through independent samples-t test. The analysis shows that females were discriminated more than males in private organizations. Thus the findings show that females are discriminated more than males in private sector than in public sector. The impact of gender discrimination on satisfaction &motivation, commitment & enthusiasm and stress level was assessed through Pearson product moment correlation co-efficient. The results show that gender discrimination decreases satisfaction & motivation and commitment & enthusiasm level of employees, and increases the stress level in the employees.

Key words: Gender discrimination, Workforce, Satisfaction & Motivation, Commitment & Enthusiasm, Stress Level.

I .Introduction :

In (1998 Decenzo,) has explained that HRM in any organization is concerned with the staffing, training, developing, motivating and maintaining the employees. Staffing is concerned with recruiting and selection ,strategic human resource planning,. , HRM, Fifty years ago was considerably simpler because work force was strikingly homogenous. Now-a-days work force scenario has changed has changed from homogeneous to heterogeneous type.Managing diversity is very essential for any organization, especially in this era of globalization. Managing diversity is required to close the unfair discrimination and thus enable employees to compete on equal basis.

II . Literature Review :

Researchers found that women in Sweden suffer more from sticky floor effects than glass ceilings. Their study also showed that women with small children face a largest gender penalty in careers. Gender penalty is larger for younger and older women and less for middle aged women. There was no any empirical support in their study that women have lesser career opportunities in the private sector than in public sector, relative to men. Susan et al (1998) have focused on the work place gender discrimination rational bias theory. According to this theory, decision makers may choose to discriminate if they believe that their superiors or others having power over their careers expect or prefer it. The findings of their research showed that businessmen discriminated women and people at the top of the organization are most biased against women than people at the bottom. Their study has also confirmed that management support discrimination, though those discriminations were less than the findings of earlier research, reflecting increasing equal opportunity. It was also confirmed through their research that the discrimination is more because of external pressures than from internal. Habib (2000) has studied the effects of Brick Wall and Glass ceiling in public administration of Bangladesh. His analysis has shown that women are discriminated in civil services of Bangladesh from entry to the higher posts (Glass Ceiling). Social cultural factors are the principal stumbling blocks and build a wall for entry of woman into civil services. Their career path was hindered by the impediments of the systematic and attitudinal reasons. Government laws and regulations in this regard are proving ineffective. However, that discrimination was not for the women who came from upper class. This disparate treatment against women had implications for their morale, motivation and performance. Uzma (2004) found out that identity is created through the society, environment and parents. It is a two-way process - how people view you and how you view yourself. Attitude of parents towards their children formulate their identity. Parents usually consider their daughters as weak, timid, and too vulnerable; they need to be protected by the male members of the society. Because of this reason females cannot suggest or protest. This is the first step of subjugation and suppression. According to her; even the educated females have the double identity – professional and private. Another finding of her research was that the income of the women is not considered as the main financial source for the family, but as supplementary to the income of their males. She also found that those results were not valid for the upper and advanced families, where complete freedom is given to their females.

Research Methodology: The study objective is to add few factors and dimensions of gender discrimination which are responsible for the effect on employee performance/Productivity. Here the research will present the relationship between gender discrimination and employee productivity in

Telecom sector of Pakistan, narrow down to the telecom of telenor and Ufone of Islamabad..

Independent variables :

Independent variables affect the dependent variables either negatively or positively, it depends the circumstances and vary to vary in different studies. Sex(Gender) discrimination and its dimensions are the independent variable. Gender discrimination is one of the leading social problems all over the world.

Dependent variable:

The concerned study variable is known as dependent variable which may be affected/influenced by the other independent variables and can be described the variation of discrimination over the productivity of the organization. Productivity is the major variable (dependent).

III.. Gender Discrimination :

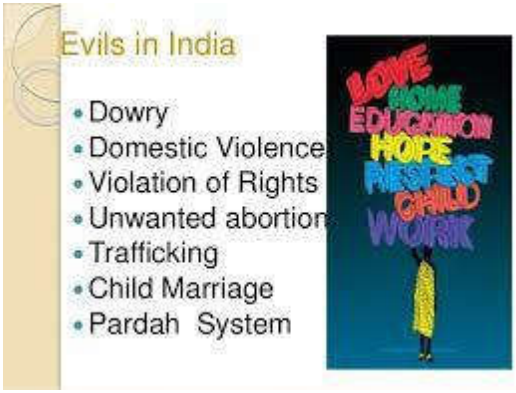
No law has ever attempted to define precisely the term' discrimination said Wayne (1995', in the context of workforce, it can be defined as the giving of an unfair advantage (or disadvantage) to the members of the particular group in comparison to the members of other group. Narrating the decisions of the courts, Ivancevich (2003) writes that in interpreting title VII of the 1964 Civil Rights Act and other laws, the United States' courts have held that both intentional (disparate treatment) and unintentional (disparate impact) acts of covered entities may constitute illegal employment discrimination.

IV. Statement of the Problem :

Gender discrimination turns the employees emotionally brittle, simple peace loving employees transform into paranoid and suspicious, fearful and angry individuals. Elimination of Gender

Discrimination is crucial for the satisfaction and motivation, commitment and enthusiasm and less stress of the employees.

V. Problems in India: The Marriage Market



VI. Dowry:

The custom of dowry in Indian marriages is a deep-seated cultural phenomenon that has been described as one of the largest obstacles to "confront India on her road to economic and social justice. The custom is held responsible for a number of problems perpetrated against the nation's women, including dowry violence, bride burning, and wife murder. I argue that dowries exist because of a combination of two reasons. First, there is an excess supply of women in the Indian marriage market that results in the use of dowry as an equilibrating mechanism. Secondly, a differential in the patterns of human capital accumulation of men and women have led to a larger positive benefit from marriage for women than for men, the net difference of which is theoretically equivalent to the amount of the dowry. Both these explanations for the existence of dowry are fundamentally.

VII. Domestic violence:

According to a National Family and Health Survey in 2005, total lifetime prevalence of domestic violence was 33.5% and 8.5% for sexual violence among women aged 15–49.[A 2014 study in The Lancet reports that although the reported sexual violence rate in India is among the lowest in the world, the large population of India means that the violence affects 27.5 million women over their lifetimes. However, A survey carried out by the Thomson Reuters Foundation ranked India as the most dangerous country in the world for women.

VIII. National Crime Records Bureau says reported that reported crime rate of 46 per 100,000, rape rate of 2 per 100,000, There are several domestic violence laws in India. The earliest law was the Dowry Prohibition Act 1961 which made the act of giving and receiving dowry a crime. In an effort to bolster the 1961 law, two new sections, Section 498A and Section 304B were introduced into the Indian Penal Code in 1983 and 1986. The most recent legislation is the Protection of Women from Domestic.

IX. Discussion and Conclusion:

Employee (male/female) refers to the personnel who executes different functions, duties and responsibilities in order to achieve the organizations/institutes objectives. Organizational productivity and performance affected by employee performance and employee performance affected by gender discrimination. The survey conducted in telecom sector especially ufone and telenor companies‟ employees male and female in Islamabad for the research study to find out the relationship and affect on employee productivity. Therefore statistical tools employed correlation and regression analysis and model summary shows the significant relationship between gender discrimination and employee productivity. All hypotheses proved and claimed about significant association and relationship between gender discrimination & employee productivity. Gender differences in hiring, gender biasness in promotion and gender disparity in provision of goods and facilities have negative relationship with productivity.

The human resource managers should be careful while hiring & promotion of the employees and providing facilities to employees in order to avoid any gender discrimination because it has a direct relationship on employee productivity and which will reduce organizational productivity. The human resource managers should provide facilities and provision of goods according to the ratio of men and women. In the mean while promotion of employees on merit and seniority wise. They must accept the importance of female workers and realize the international scenario of women fair representation and quotas in hiring, and facilities in organizations, otherwise they will get defame and bad reputation in corporate sector of the world which will reduce international business cooperation and lose large number of business orders. The decline in number of business orders from all over the world will affect the profitability and survival of the organizations.

Therefore, top management must avoid discriminatory practices in hiring, promotion, and facilities to the employees irrespective of what is his/her gender. Positive and loyal culture will build in the organization which will increase the productivity and profitability of the organization.

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TALENT MANAGEMENT

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ABSTRACT:

This paper observes that study of entering a new era: the emergence of "Talent Management." While strategic HR continues to be a major focus, HR and L&D organizations are now focused on a new set of strategic issues: How can we make our recruiting process more efficient and effective by using "competency-based" recruiting instead of sorting through resumes. Talent management is also known as HCM (Human Capital Management), HRIS (HR Information Systems) or HRMS (HR Management Systems), and HR Modules. Organizations are made up of people: people creating value through proven business processes, innovation, customer service, sales, and many other important activities. As an organization strives to meet its business goals, it must make sure that it has a continuous and integrated process for recruiting, training, managing, supporting, and compensation acting these people. This paper strives to understand the Talent Management as an emerging concept and seeks to understand its objectives, process, and critical success factors.

I INTRODUCTION:

The 21st century brings a unique and unprecedented set of challenges and potential opportunities for organizations. The competitive landscape is increasingly global in scope. Today, even small or midsize companies are challenged to compete on a global scale. The number of multinational corporations has doubled since 1990 . Growth opportunities are more prevalent in developing regions of the world where the middle class and new consumers are emerging rapidly. In fact, the global middle class is expected to grow by 172 percent from 2010 to 2030. At the same time, there are shifts in the available talent pool and workforce demographic. An aging demographic in the West is yielding to higher proportions o f college graduates coming from Latin America, Russia, and Asia. Individuals are being asked to do more with less, but they also have higher expectations for their employers and are more mobile than previous generations. Consumers also have higher expectations, and the companies that make the best use of technology and data analytics to better understand their customers and break down barriers will win . The pace of market growth, the speed of innovation, and ever - changing demographics create more

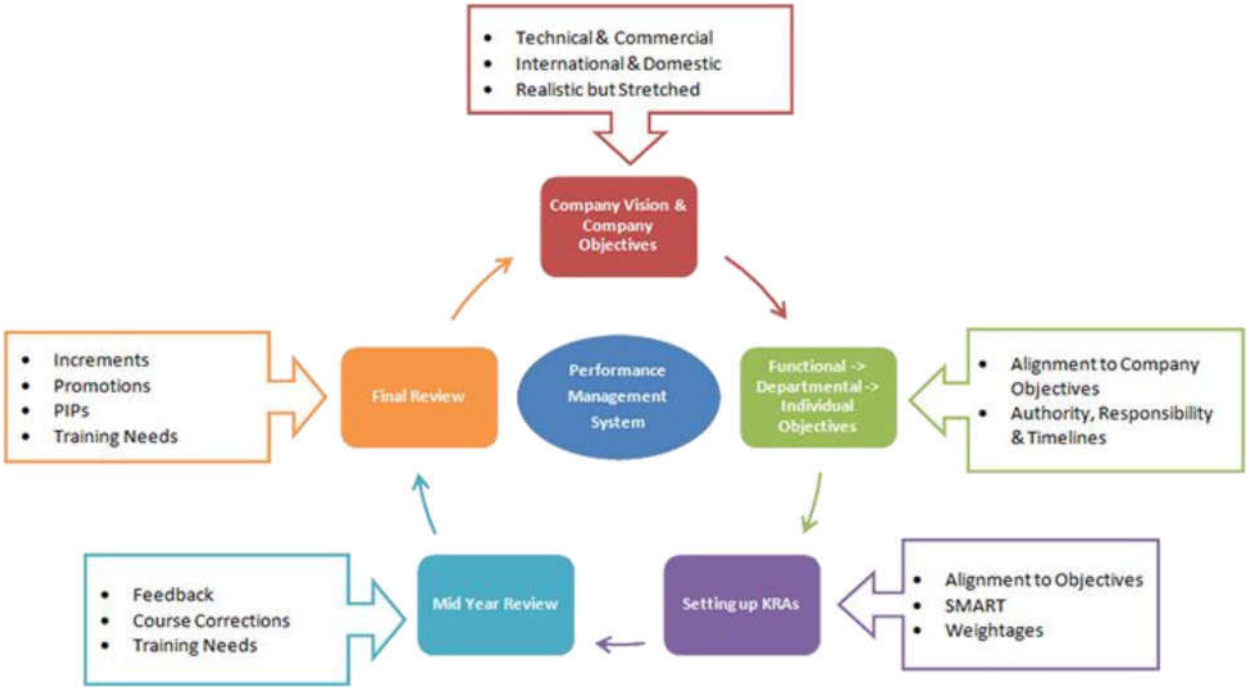
opportunities to both create and extract value, but its often more difficult to pinpoint those opportunities and act upon them. So, how do companies compete in this increasingly complex and changing environment? One of the central differentiators for companies is a sound business strategy. Leaders who are adept at creating winning strategies, make an integrated set of choices regarding issues such as where the business will be active, how to get there, how to win, the specific actions and moves, and the model of profit generation . A business strategy articulates the direction a business will pursue and the steps it will take to achieve its goals. A good strategy has at least three characteristics: it creates value, it‟s unique, and it cannot be imitated

II. OBJECTIVES OF STUDY:

1. To assess the role of Talent Management in Industry.

2. To analyze the Talent Management Process

3. To find out the critical success factors of Talent Management.



III. OBJECTIVES OF TALENT MANAGEMENT

i. ***Recruiting the Talent:*** The actual process of hiring starts from here. This is the stage when people are invited to join the organization.

ii. ***Selecting the Talent:*** This involves meeting with different people having same or different qualifications and skill sets as mentioned in job description. Candidat es who qualify this round are invited to join the organization.

iii. ***Training and Development:*** After recruiting the best people, they are trained and developed to get the desired output.

iv. ***Retention***: Certainly, it is the sole purpose of talent management process. Hiring them does not serve the purpose completely. Retention depends on various factors such as pay package, job specification, challenges involved in a job, designation, persona l development of an employee, recognition, culture and the fit between job and talent.

v. ***Promotion:*** No one can work in an organization at the same designation with same job responsibilities. Job enrichment plays an important role.

vi. ***Competency Mapping:*** Assessing employees‟ skills, development, ability and competency is the next step. I f required, also focus on behavior, attitude, knowledge and future possibilities of improvement. It gives you a brief idea if the person is fir for promoting further.

vii. ***Performance Appraisal:*** Measuring the actual performance of an employee is necessary to identify his or her true potential. It is to check whether the person can be loaded with extra responsibilities or not.

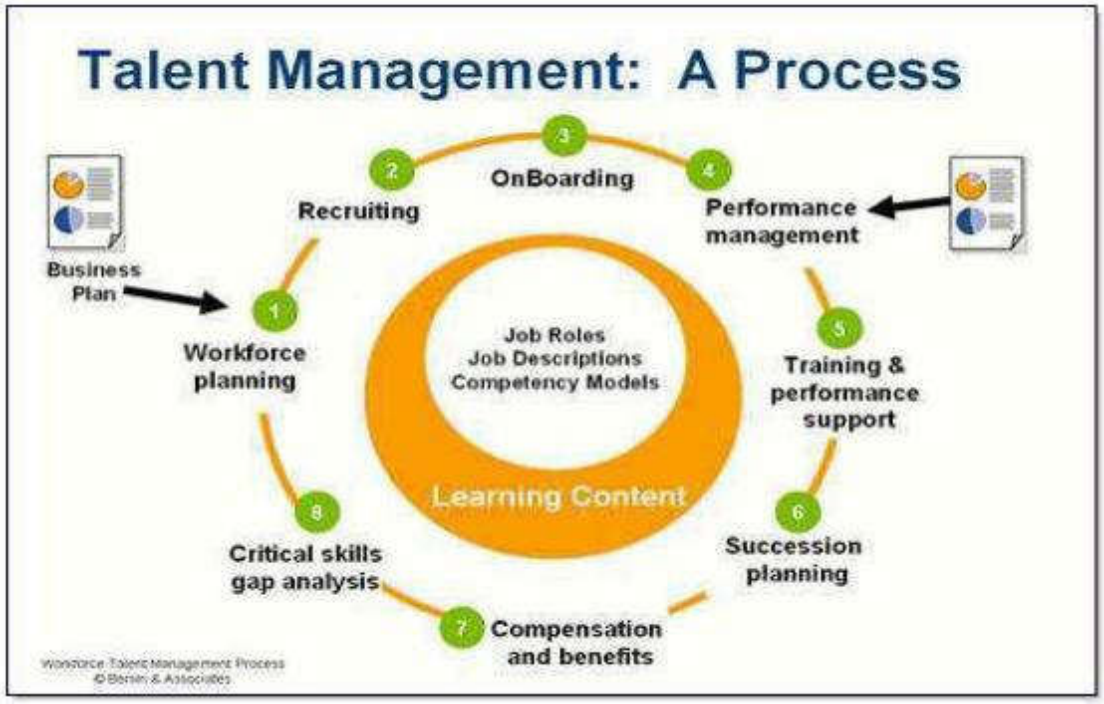
viii. ***Career Planning:*** If the individual can handle the work pressure and extra responsibilities well, the management needs to plan his or her career so that he or she feels rewarded. It is good to recognize their efforts to retain them for a longer period of time.

ix. ***Succession Planning:*** Succession planning is all about who will replace whom in near future. The employee who has given his best to the organization and has been serving it for a very long time definitely deserves to hold the top position. Management needs to plan about when and how succession will take place.

x. ***Exit:*** The process ends when an individual gets retired or is no more a part of the organization

IV. TALENT MANAGEMENT PROCESS

Organizations are made up of people creating value through proven business processes, innovation, customer service, sales, and many other important activities. As an organization strives to meet its business go als, it must make sure that it has a continuous and integrated process for recruiting, training, managing, supporting, and compensating these people.



Workforce Planning : Integrated with the business plan, this process establishes workforce plans, hiring plans, compensation budgets, and hiring targets for the year

Recruiting : Through an integrated process of recruiting, assessment, evaluation, and hiring the business brings people into the organization.

On Boarding: The organization must train and enable employees to become productive and integrated into the company more qu ickly.

Performance Management: By using the business plan, organization establishes processes to measure and manage employees. This is a complex process in itself.

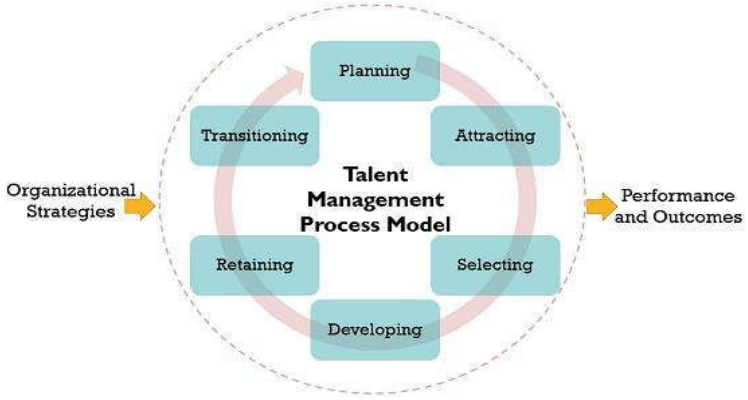
Training and Performance Support: Of course this is a critically important function. Here we provide learning and development.

Succession Planning: As the organization evolves and changes, there is a continuous need to move people into new positions. Succession planning, a very important function, enables managers and individuals to identify the right candidates for a position. This function also must be aligned with the business plan to understand and meet requirements for key positions 3-5 years out. While this is often a process reserved for managers and executives, it is more commonly applied across the organization.

Compensation and Benefits: Clearly this is an integral part of people management. Here organizations try to tie the compensation plan directly to performance management so that compensation, incentives, and benefits align with business goals and business execution.

Critical Skills Gap Analysis: This is a process we identify as an important, often overlooked function in many industries and organizations. While often done on a project basis, it can be —businesscritical." For example, today industries like the Federal Government, Utilities, Telecommunications, and Energy are facing large populations which are retiring. How do you identify the roles, individuals, and competencies which are leaving? What should you do to fill these gaps? We call this "critical talent management" and many organizations are going through this now.

Critical Success Factors of Talent Management Strategy Alignment to Corporate Strategy Ensuring that the talent strategy is closely aligned with the corporate strategy must be a priority. In developing a talent strategy, both internal and external factors should be taken into account, including fact ors influencing talent management. Strategic analysis from the business perspective should fed into an HR forecast which can help shape an organization„s tailored approach to talent management. Often organizations are at different stages of talent manageme nt strategy development. Research suggests that for a number of organization„s there was a desire to progress through the stages highlighted in following figure making the transition to a more formal, strategically-integrated approach.



Inclusive versus Exclusive Approaches: Some organizations adopt an inclusive approach to talent manage ment creating a ―whole workforce approach to engagement and talent development, while others develop a more exclusive focus segmenting talent according to need. Regardless of which approach organizations adopt, fairness and consistency must be applied in a talent management processes. Diversity considerations must also be built -into talent management processes to ensure that organizations are able to draw from the widest pools of talent possible. Involving the Right People Careful considerations need to be paid to involving the right stakeholders in the talent management strategy. Clearly, HR specialists have an important role to play in providing support and guidelines in the design and development of approaches to talent management that will fit the needs of the organization.

CONCLUSION: Talent management in an organization aims at ensuring employee recruitment, training and development, performance reviews and their compensation. Working towards enhancing a good talent management system in the organization ensures these components of human resource contribute to the success of the organization. The advantages that the components bring to the organization also outweigh the disadvantages considering organizations benefit from these approaches. These ensure the organization attracts highly qualified employees and finds it easy to retain them and hence improving their human resource element. Talent management enhances reviews that prove vital in developing employees. They reveal employee weaknesses and result in the development of training needs and programs that will improve the skills of the employees hence maintaining their talents. Employee talents also develop and change with changes in the organization needs hence increasing and improving their ability to execute their roles. Therefore, the application of talent management proves an ideal approach in employee development and improving the performance of each personnel.

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A STUDY ON ASSET ALLOCATION OF MUTUAL FUNDS

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ABSTRACT

An investment is a commitment of funds made with the expectation of some return in the form of capital appreciation. Different investment avenues are available to the investors such as fixed deposits, insurance, post office savings/ national savings certificate, gold/e-gold, bonds, public provident fund (PPF), real estate, shares, commodities, etc. Mutual fund is one of the important investment vehicle that offer good investment prospects to the investors. Mutual fund is a trust that pools the savings of various individuals by issuing units to them and then invests it in various securities such as shares, debentures and bonds as per the stated objectives of the scheme. Further, this investment revenue offers several benefits to the investors as diversification, professional fund management, liquidity, transparency etc. Today a wide variety of mutual fund schemes are available for the investors such as Open-ended, Close-ended, Interval, Growth, Income, Balanced, Equity Linked Saving Schemes (ELSS) and Exchange Traded Funds (ETF), etc. These schemes are catering to the investors' needs, risk and return tolerance

I. KEYWORDS: Asset Allocation, Mutual Funds, Maximum Returns, Minimum Risk

II.INTRODUCTION:

The theory is that the capitalist will reduce risk as a result of every plus category incorporates a totally different correlation to the others; once stocks rise, as an example, bonds usually fall. At a time once the exchange begins to fall, land could begin generating above-average returns

The amount of AN investor's total portfolio placed in every category is set by An plus allocation model. These models ar designed to replicate the private goals and risk tolerance of the capitalist.

Any additional, individual plus categories is sub-divided into sectors (for example, if the plus allocation model needs four-hundredth of the full portfolio to be invested with in stocks, the portfolio manager could advocate totally different allocations at intervals the sector of stocks, like recommending a particular share in large-

capitalization, mid-cap, banking, producing, etc.)

III. OBJECTIVES OF THE STUDY

- To minimize volatility and. maximizing returns
- The method involves dividing your cash among classes that don't all reply to a similar economic process within the same means at a similar time.
- To determined supported your age, lifestyle, goals and risk taking appetency.
- For example a conservative capitalist are told to carry five hundredth in equity mutual funds, forty fifth in debt mutual funds and five-hitter in gold funds.

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IV. SCOPE OF THE STUDY

This project includes the ways of study risk come analysis, applied math techniques like risk, average come, variance, Variance, Sharpe quantitative relation, Turn over quantitative relation, plus allocation are used for the analysis.

V. RESEARCH METHODOLOGY

Primary information:

The info that is directly collected from the businesses

Secondary information:

Within the gift project work {the information the info the information} has been collected from pronto on the market sources that's secondary data like websites, newspapers journals, articles etc.

VI. REVIEW OF LITERATURE

Cummings J.R (2016) Examined the link between fund size and performance for two major superannuation business sectors in Australia: retail and not-for-profit, using a particular but confidential information. Results advocate that members show pride in being endowed in larger superannuation funds for three reasons: (i) larger not-for-profit funds supply diversification edges of investment in extra and classes likewise as unlisted property and private equity, (ii) larger funds in every sectors avoid the dimensions diseconomies in investment returns documented in studies of equity Mutual Funds and (iii)larger funds build substantial savings by spreading fastened in operation prices (such because it infrastructure) over a bigger plus base.

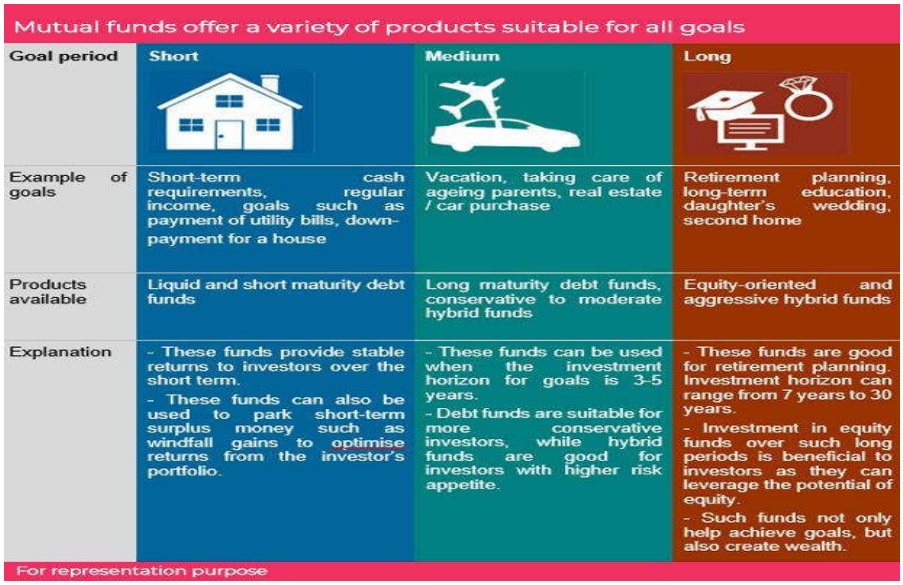
Haque, Tariq H. and Ahmed, Abdullahi D (2015) Found that Australian open-end investment company investors ought to avoid high fee funds as these funds generate relatively low after-fee risk-adjusted returns every unconditionally and in weak economic conditions.High-fee living Australian wholesale funds perform comparatively powerfully in each weak

economic conditions and flatly. High-fee funds in different styles of Australian Mutual

Funds usually don't perform powerfully either in weak economic conditions or categorically. Among low-fee funds, it had been typically true that those that perform poorly categorically but well in weak economic conditions can charge over those that perform poorly categorically and poorly in weak economic conditions.

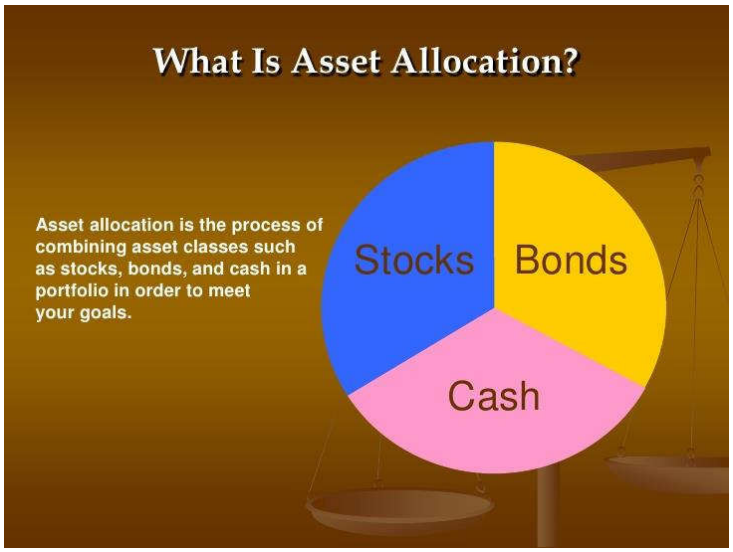
Patwa, Prerna and Agarwal, Kshama (2014) Evaluated the performance of equity funds by analyzing a sample of 4 firms every from each the sectors and 5 schemes of comparable nature. It evaluated the risk-return profile of the funds. Testing the hypotheses victimization Mann-Whitney U-test, the study discovered that there is a important distinction between the performances of personal and public sector Mutual Funds and that the personal sector has performed higher than the general public sector.

Agrawal D (2011) In his paper titled live performance of Indian Mutual Funds, delineate regarding Mutual Funds size and plus allocation. The paper analyzes Indian open-end investment company business valuation mechanism with empirical studies on its valuation. It to boot analyzes data at every the fund-manager and fund-investor levels. The study discovered that the performance is stricken by the saving and investment habits of the folks and also the second facet the confidence and loyalty of the fund manager and rewards affects the performance of the MUTUAL FUNDS business in country.



VII. ASSET ALLOCATION:

Asset allocation funds are mutual funds that invest in a varied class of assets. These assets can be equity-oriented, debt-oriented or even other asset classes like gold, other metals, and commodities.



Asset allocation funds are meant for risk-averse investors. Equity is an important asset class to have because it helps beat inflation. But equity can also be volatile, which makes it unsuitable for all investors. This is where asset allocation funds come into the picture.

Different asset allocation funds invest a part of their assets in equities and the rest in other assets. This helps them generate good returns while reducing risks.

VIII. DIFFERENT TYPES OF ASSET ALLOCATION FUNDS

Asset allocation funds can be broadly classified into two categories:

a. Dynamic Asset Allocation Funds

These funds keep changing/adjusting the proportion of assets in their portfolio according to the market fluctuations. When one particular asset class is expected to do well, the fund increases allocation to that asset and vice versa.

b. Static Asset Allocation Funds

Static asset allocation funds have a pre-decided percentage of funds allocated to different asset classes. The most popular type of funds here are balanced funds that invest at least 65% of their assets in equities and the rest primarily in debt.

IX. IMPORTANCE OF ASSET ALLOCATION FUNDS

Investors should consider asset allocation funds because of the following reasons:

a. Diversification

Investors who want to minimize their risk for a given time frame can invest in different classes of assets and diversify their portfolio.

b. Control over volatility

If an asset class performs outstandingly in one year, there is no certainty that it will perform equally well in the next year as well. The asset class can underperform as well. By investing in a diversified portfolio, your investments will not get affected greatly by one asset class.

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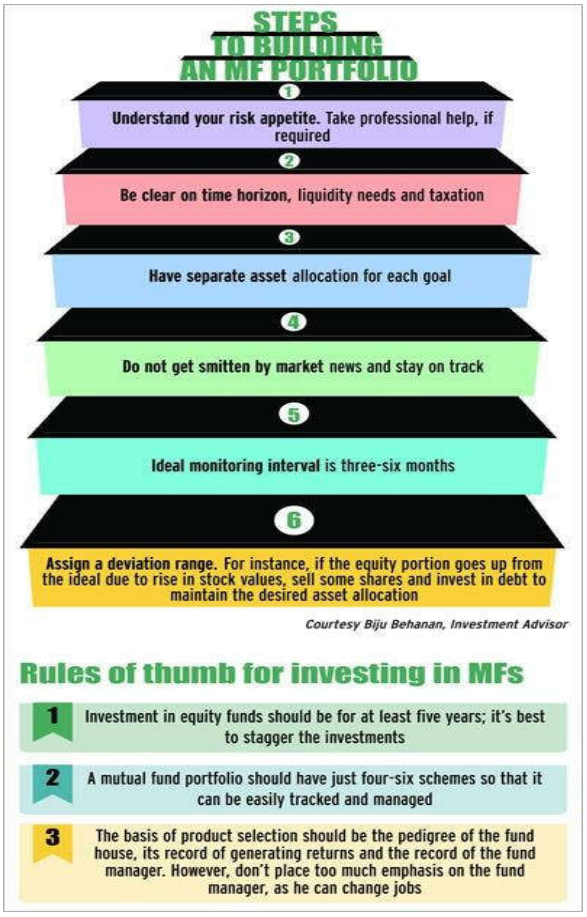

X. CONCLUSION: Asset allocation in practice, you have learnt how to determine different investor objectives with respect to risk and return and investor constraints such as investing in sustainable sectors or being concerned with taxation or currency issues. Mutual fund business is one in all the quickest growing business in Asian nation and it's already established in foreign countries. investment in Mutual Funds could be a ton of safe as compared to equity moreover because it provide handsome returns. supported differing kinds of equity and debt mutual funds, the subsequent conclusion is created.

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LEVELS OF MANAGEMENT IN ORGANIZATIONAL STRUCTURE

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ABSTRACT

This title is exploring the levels of management in organizational structure. Management in all business and organization activities is the act of coordinating the effort of people to accomplish desire goals and objectives using available resources efficiently and effectively management comprises planning, organization ,staffing, leading or directing and controlling and organization. People in all of the organization operate and work in dynamic environment. But they don't operate same level they operate different level, The hierarchy of the operation in the organization is called as level's of management. A part of an organization that maintains responsibility for the productivity and the work performance of employees. There are generally three levels of management within an organization including top-level, middle-level, and first level that are tiered in numbers with more first level managers, a smaller amount of middle managers, and less top-level managers within one organization. Each level possesses certain job responsibilities within their position to ensure the effective overall operation of the organization.

I.OBJECTIVE: The objectives of this lesson are to enable to define management; to describe the nature and scope of management; to know the difference between management and administration; to understand various levels of management; and to describe the various skills that are necessary for successful managers.

II.INTRODUCTION

The term LEVLES OF MANAGEMENT refers to a line of demarcation between various managerial positions in an organization. The number of levels in management increases when the size of the business and force increases and vice versa. The levels of management determines a chain of command, the amount of authority and status enjoyed by any managerial position. In an organization three levels of management usually identified. Management is essential not only for business concerns but also for banks, schools, colleges, hospitals, hotels, religious bodies, charitable trusts etc. Every business unit has some objectives of its own. These objectives can be achieved with the coordinated efforts of several personnel. The work of a number of persons are properly co-ordinate to achieve the objectives through the process of management is not a

matter of pressing a button, pulling a lever, issuing orders, scanning profit and loss statements, promulgating rules and regulations. Rather it is the power to determine what shall happen to the personalities and happiness of entire people, the power to shape the destiny of a nation and of all the nations which make up the world. Management is a vital aspect of the economic life of man, which is an organized group activity. It is considered as the indispensable institution in the modern social organization marked by scientific thought and technological innovations. One or the other form of management is essential wherever human efforts are to be undertaken collectively to satisfy wants through some productive activity, occupation or profession.

III. DEFINITION OF MANAGEMENT

although management as a discipline is more than 80 years old, there is no common agreement among its experts and practitioners about its precise definition. In fact, this is so in case of all social sciences like psychology, 5 sociology, anthropology, economics, political science etc. As a result of unprecedented and breath-taking technological developments, business organizations have grown in size and complexity, causing consequential changes in the practice of management. Changes in management styles and practices have led to changes in management thought. Moreover, management being interdisciplinary in nature has undergone changes because of the developments in behavioural sciences, quantitative techniques, engineering and technology, etc. Since it deals with the production and distribution of goods and services, dynamism of its environments such as social, cultural and religious values, consumers' tastes and preferences, education and information explosion, democratization of governments, etc., have also led to changes in its theory and practice. Yet, a definition of management is necessary for its teaching and research, and also for improvement in its practice. Many management experts have tried to define management. But, no definition of management has been universally accepted. Let us discuss some of the leading definitions of management:

Peter F. Drucker defines, "management is an organ; organs can be described and defined only through their functions".

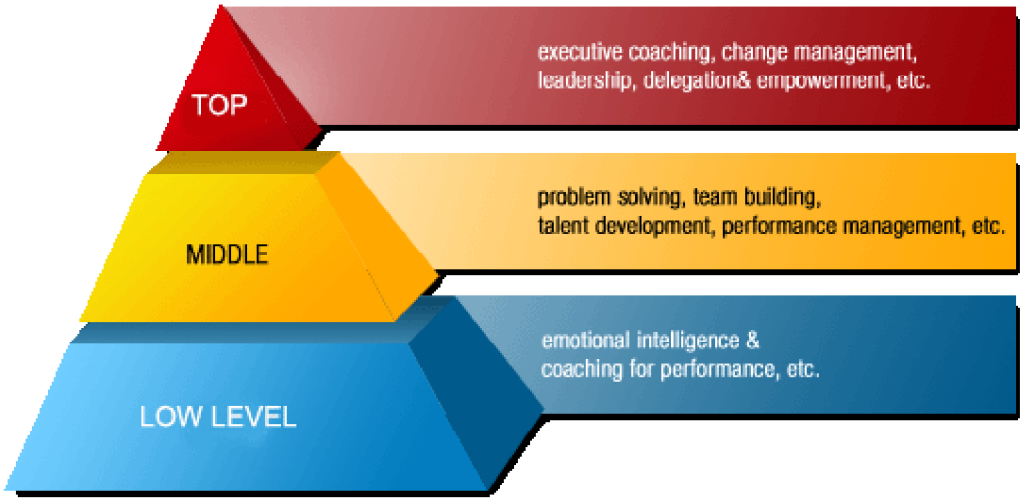
According to Terry, "Management is not people; it is an activity like walking, reading, swimming or running. People who perform Management can be designated as members, members of Management or executive leaders."

Ralph C. Davis has defined Management as, "Management is the function of executive leadership anywhere."

James Lundy, "Management is principally a task of planning, coordinating, motivating and controlling the efforts of other towards a specific objective. It involves the combining of the traditional factors of production land, labour, capital in an optimum manner, paying due attention, of course, to the particular goals of the organization."

IV. LEVELS OF MANAGEMENT :

- Top level management/Administrative level
- Middle level management
- Lower level management/ supervisory



TOP LEVEL MANAGEMENT

Top level management is a team consisting of manager from different functional levels. They are analyze, evaluate and deal with external environment. Top level management have a maximum authority in the organization and they are responsible for welfare and survival of the organization.

Roles and responsibilities of Top level management

- Top level management lays down the objectives and broad policies of enterprise.
- It issues necessary instruction for preparation of department budgets, procedure, schedules etc.
- It prepares strategic plan and policies for the enterprise.
- It controls and coordinates the activities of all the departments.
- It provides guidance and direction.

MIDDLE LEVEL MANAGEMENT

Middle level management is a second level of management. It consists of all the branch managers and departmental managers. They are responsible to the top management for the functioning of their department. They devote more time to organizational and directional functions. In small organization, there is only one layer of middle level of management but in big enterprises, there may be senior and junior middle level management

Roles and responsibilities of middle level management

- They execute the plans prepared by top level managers.

- They make plans for the sub-units of the organization.
- They participate in employment & training of lower level management.
- They give the report to the top level management.
- They diagnose and resolve problem within and among work group.
- They design and implement effective group and intergroup work and information system.

LOWER LEVEL MANGEMENT

Lower level management is third level management and it is also called as a supervisory/operative level of management. It consists of supervisors, foremen, section officers, superintendent etc. It is concern with the direction and controlling function of the management.

Roles and responsibilities of lower level management.

- They assign work to workers and they guide and instruct the workers.
- They also responsible for the proper quality and quantity of production.
- They arrange the materials, machines, tools etc.
- They make performance report of the workers.
- They spend more time in directing and controlling.
- The lower level managers make daily, weekly and monthly plans.

V. ADMINISTRATION IS A HIGHER LEVEL FUNCTION : Oliver Shelden subscribed to the first viewpoint. According to him, "Administration is concerned with the determination of corporate policy, the coordination of finance, production and distribution, the settlement of the compass of the organization and the ultimate control of the executive. Management proper is concerned with the execution of policy within the limits set up by administration and the employment of the organization in the particular objects before it... Administration determines the organization; management uses it. Administration defines the goals; management strives towards it". Administration refers to policy-making whereas management refers to execution of policies laid down by administration. This view is held by Tead, Spriegel and Walter. Administration is the phase of business enterprise that concerns itself with the overall determination of institutional objectives and the policies unnecessary to be followed in achieving those objectives. Administration is a determinative function; on the other hand, management is an executive function which is primarily concerned with carrying out of the broad policies laid down by the administration.

VI. ADMINISTRATION VS. MANAGEMENT Basis Administration Management

1. Meaning Administration is concerned with Management means getting the formulation of objectives, plans the work done through and and policies of the organization with others.

2. Nature of Administration relates to the decision- Management refers to execution work making. It is a thinking function. of decisions. It is a doing function.

3. Decision Administration determines what is to Management decides who shall Making be done and when it is to be done implement the administrative decisions.

4. Status Administration refers to higher levels Management is relevant at lower of management levels in the organization.

VII. CONCLUSION

These are the three levels in an organization top level, middle level and lower level. Top level is the highest level which has the maximum authority. Middle level is a link between the top level and lower level, Middle level receives the order from the top level and gives the instructions to the lower level and lower level consists the supervisors, foremen etc. who are in direct contact with the workers and responsible for controlling and maintaining the production. environment of an organization as well as in the outlook of the organizational members. Each member begins to see himself as a resource to others and is willing to lend his support to his colleagues when it is neededThe change must be for the better so that it develops the organization and such organizational development should be directed towards improvement in organizational health and welfare of the members. The basic purpose of such development is to improve the operational as well as interpersonal skills of employees and it also helps members to develop interpersonal competence including communication skills and an insight into themselves and others. It improves communication channels at all levels of the hierarchy and build team spirit among workers as that their inter-group relationships are highly cordial.

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BUSINESS ENVIRONMENT & CULTURAL DIMENSIONS IN ORGANIZATIONAL PERFORMANCES

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ABSTRACT: The study obverses that estimating the performance of the organization has always been of interest to management teams and researchers. In this regard, some researchers focused on determining definitions and how to measure organizational performance. The main objective of this study is to overview of organizational performance index definition and performance measurement. The history of performance is classified into six different subcategories. Various ideas and opinions on each of the performance subcategories are discussed. This review paper is applicant for researcher and student to better to understand definition and modelling of performance in organizational studies.

II. KEY WORDS: Business Environment, Organizational, Performance and Effects of Business Environment on OrganizationalPerformance, organizational performance index, organizational theory, performance measurement, efficiency, effectiveness.

III. INTRODUTION: Organizational performance comprises the actual output or results of an organization as measured against its intended outputs (or goals and objectives).According to Richard et al. (2009) organizational performance encompasses three specific areas of firm outcomes: financial performance (profits, return on assets, return on investment, etc.)Product market performance (sales, market share, etc.); and shareholder return (total shareholder return, economic value added, etc.). The term Organizational effectiveness[2] is broader.Specialists in many fields are concerned with organizational performance including strategic planners, operations, finance, legal, and organizational development. The cultural dimension of globalization' explores the intensification and expansion of cultural flows across the globe. Critics of cultural globalization claim that the world is being homogenized or 'Americanized'. Steger compares the current study of globalization to the ancient Buddhist parable of blind scholars and their first encounter with an elephant. Similar to the blind scholars, some globalization scholars are too focused on compacting globalization into a singular process and clashes over "which aspect of social life constitutes its primary domain" prevail.

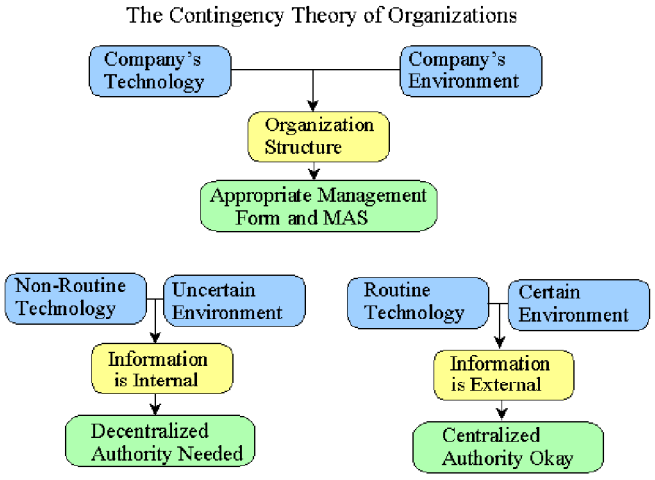
III. OBJECTIVE : One of the most critical assets of an organization used to be

machinery, but in the 21st century, it is knowledge. This knowledge can refer to creativity, ideas, expertise or experience. Employees are often the owners of this knowledge. Organizational culture can promote or hinder knowledge sharing. Multicultural organizations often face challenges in creating organizational cultures where employees feel safe to share knowledge. Organizational culture within a multicultural organization is critical to performance efficiency.

IV. ORGANIZATIONAL CULTURE'S IMPACT ON PERFORMANCE EFFICIENCY

Clear and open communication makes for an effective organizational culture. Multicultural organizations need to recognize and respect cultural rules. If cultural rules are broken, it can delay and hinder the knowledge sharing needed for performance efficiency. Being able to share the problems that prevent optimal performance and the consistency to achieve that performance can be hindered by ignoring cultural cues. By understanding and respecting cultural rules, effective leaders can create an environment where knowledge is shared freely.

V. Organizational environment is a set of forces that surrounding an **organization** that have the potential to affect the way it operates and access to scarce resources. ... Contingency theory posits that there is no one best way of structure and manage organizations.



Types of Environment

Micro Environment: the skill and ability of employees, their attitude to work, relations between managers and subordinates etc. may be regarded as internal environment of business.

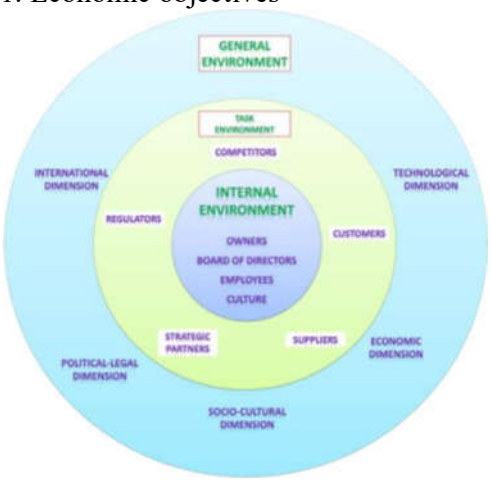
These are important factors effect business operations.

Macro Environment: on the other hand, external environment refers to all those aspect of the surroundings of business, which are not with in control of the

managers and mayaffect activities to a great extent.

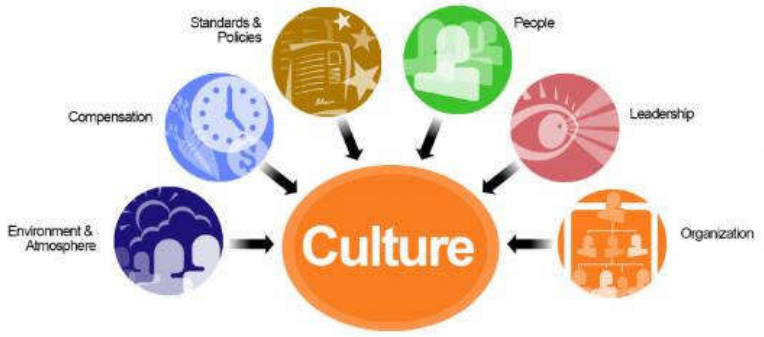
Objectives of business environment

1. Economic objectives
2. Social objectives
3. Human objectives
4. National objectives



VI. CULTURE:

A culture is a way of life of a group of people-the behaviour's beliefs, values ,and symbols that they accept, generally without thinking about them, and that are passed along by communication and imitation from one generation to the next. Culture is a symbolic communication.



Dimensions of culture:

*Neutral Vs emotional

* Neutral: culture in which emotions not shown -High neutral countries ,people act stoically and maintain composure(e.g., Japan, and u.k)

Emotional: Emotions are expressed openly and naturally

-high emotions and cultural: people smile a lot, loudly, greet each other with enthusiasm (e.g., Mexico , Netherlands ,Switzerland)

*Specific Vs diffuse

- specific: large people space shared with others and small private space guarded closely

* high specific culture: people open, extroverted; strong separation work and personal life (e.g.,Austria,U.K.,U.S)

- Diffuse: public and private spaces similar size, public space guarded because shared with private space; people indirect introverted ,work/private life closely linked (e.g., Venezuela,china,spain)

* Achievement Vs Ascription

- Achievement culture ;status based on how well perform functions (Austria,Switzerland,U.S.)

-Ascription culture: status based on who or what person is (e.g., Venezuela, China, Indonesia)

-TIME:

-Sequential: only one activity at a time: appointments kept strictly, follow plans as laid out (U.S.)

- Synchronous: multi-task, appointments are approximate, schedules subordinate to relationships (e.g., France, Mexico)

* THE Environment

- Inner-directed: people believe in control of outcomes (U.S., Switzerland, Greece, Japan)

- Outer-directed: people believe in letting things take own course(China, many other Asian countries)

VII. RECOMMENDATIONS:

- Embrace transparency. Transparency isn't just positive for employees.
- Recognize and reward valuable contributions.
- Cultivate strong coworker relationships. ...
- Embrace and inspire employee autonomy. ...
- Practice flexibility. ...
- Communicate purpose and passion. ...
- Promote a team atmosphere. ...
- Give and solicit regular feedback.

VIII. CONCLUSION:

Business environment involve internal and external environment. Business environment is important for an organization to identify the weaknesses and threats. This helps an organization to reduce the risk of getting failure in their operation and development in new product. The culture within an organization is very important, playing a large role in whether it is a happy and healthy environment in which to work. In communicating and promoting the organizational ethos to employees, their acknowledgement and acceptance of it can influence their work behaviour and attitudes.

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OVERVIEW OF E-COMMERCE AND PRESENT GLOBAL TRENDS

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ABSTRACT: E- commerce stands for electronic commerce. In other word sit is called as e-trade or e- business. E- commerce is a transaction of goods and services conducted electronically between business and customer over computer network such as internet. This saves time for participants on both ends. It has a pretty good role in our daily life also. In daily life there are many applications of e- commerce. The main services provided by e-commerce are e- mail, video- conferencing, electronic shopping, electronic banking etc. We can see how important it is for any kind of business. In this paper we will discuss about how e-commerce effects the consumers and business both positively and negatively, and we also talk about the types of e-commerce. More consumer demands appear in the internet than any other transmission mediums today. According to Morgan Stanley U.S. Investment Research, the internet only takes four years to reach fifty million people while television take more than ten years and radio about 38 years. It demonstrates that the internet has a huge potential to grab many customers in a short amount of time, which in turn can become a target market for growing firms.

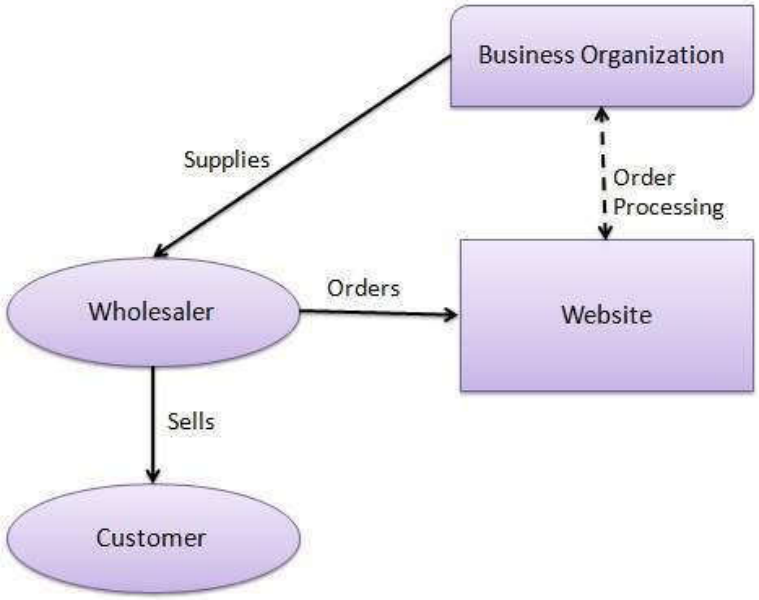
I.INTRODUCTION: Electronic commerce is all started in 1979 by MICHAEL ALDRICH an english inventor, innovator and entrepreneur. He enabled online transactions by inventing online shopping. It is the process of execution of commercial transactions electronically with the help of technologies of EDI electronic data interchange, EFT electronic fund transfer, supply chain management, internet marketing etc….In these cases customer deals directly with producer/sellers and intermediaries who offers a wide range of goods and services.E-commerce is the largest sector of the electronics industry. It is generally used to improve the efficiency and effectiveness of a company's sales efforts. Instead of taking orders from customers manually like by making telephone calls or meeting personally, orders are received digitally through internet.

II. KEY WORDS: Types of e-commerce, pros and cons of e-commerce, top e-commerce websites in the world.

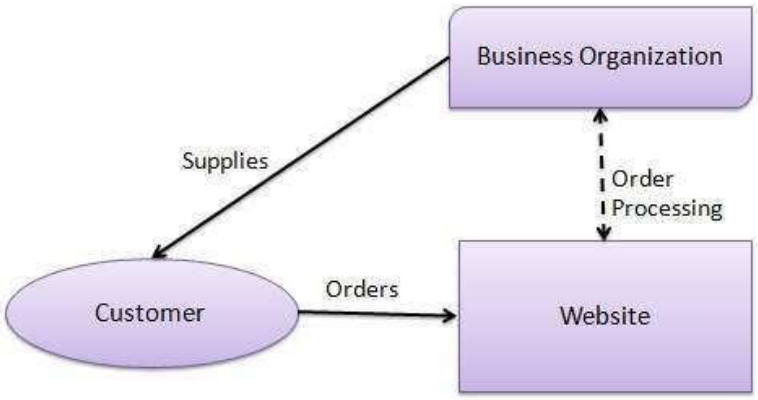
III. TYPES OF E-COMMERCE: It is basically divided into six types

- Business To Business
- Business To Customer
- Customer To Customer
- Customer To Business
- Business To Government
- Government To Business.

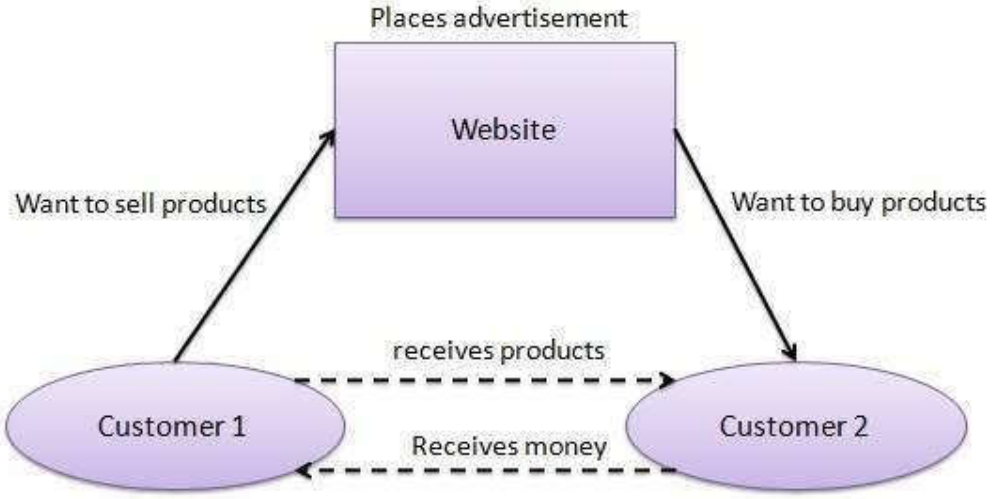
BUSINESS TO BUSINESS(B2B):In this case both the seller and the buyer are business entity. In this the business organisation will sell its product to another business organisation/intermediate who will sell goods to the final consumer B2B covers a large number of applications, which enables business to form relationships with their distributors, re-sellers, suppliers, etc. Examples for B2B are bulk bookstore, kick starter etc..



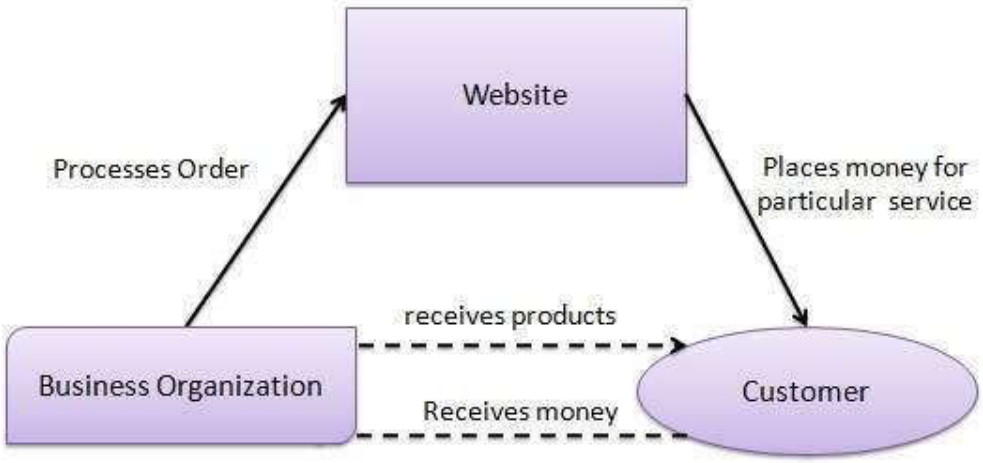
BUSINESS TO CUSTOMER(B2C):In this case,the seller is a business organisation whereas the buyer is the customer. Typically electronic stores are set up on the internet to sell goods to customers. Some of the examples of B2C are AMAZON,FLIPKART, WALMART etc….B2C not only includes the products but it also offers services as well. The decision-making process for a B2C purchase is a much shorter than a business-to-business (B2B) purchase. In business to customer the customer first visit the website of the product which he want then he will compare the prices and qualities of the product, he will select the product place the order, then the organisation will accept the order and dispatches the product.



CUSTOMER TO CUSTOMER(C2C):This refers to a situation where buyer and seller are customers. with the help of e-commerce, online auctions provide an effective means for supporting C2C e-commerce. In this model the customer can sell their property, car, motor vehicles etc..Or rent a room by providing information on the website. Some websites will not charge for its service. some other customer may opt the product of the first customer by seeing the advertisement on the website. Examples are OLX,QUICKER and other websites.



CUSTOMER TO BUSINESS(C2B):this is a new form of commerce in which a consumer specifies the requirements to a business, which provides a product that means these requirements. these requirements could be as simple as an acceptable price, customisation of an existing product or creating a new product. This type of E-commerce is mostly used for individual consumer giving services or products to an organization or a company. Especially if you from software field, you can give your services and use your skills by using some website like freelancer, fiver etc, the companies are waiting to hire a skilled service and all this is done by C2B model.



IV. PROS AND CONS OF E-COMMERCE:

PROS TO ORGANISATION:

1. Organisation can expand their market globally with less capital investment and it can easily locate more customers, suppliers and business partners globally.
2. E-commerce helps in reducing the paper based information bt digitalsing the info.
3. E-commerce provides better customer service and also improves brand image of the company.

PROS TO CUSTOMERS:

1. Customer can buy the product or service at anytime from anywhere 24*7.
2. E-commerce provide many option with quick delivery to the customer.
3. It provides many option customer can compare and select cheaper and better quality.

PROS TO SOCIETY:

1. Customer need not travel to buy a product, thus reduces traffic and air pollution.
2. E-commerce helps in reducing the cost of production, so everyone can effort the product.
3. E-commerce enable rural areas to access services and products.

CONS OF E-COMMERCE:

1. SECURITY: Many people fear of providing information regarding personal and financial even though lot of improvements are made regarding securing customer data Certain websites do not have capabilities to conduct authentic transactions.

2. TAX ISSUES**:** Sales tax is another bigger issue when the buyer and seller are in different locations the computation of sales tax poses problems.

3. PRODUCT SUITABILITY: People have to believe on the images shown, and have to purchase the product. Sometimes the product will be different from the image shown on internet. LACT OF TOUCH AND FEEL keeps the people far from online shopping.

4. HIGH LABOUR COST :To develop and manage the website of the organisation highly talented and technical work force is required. The organisations have to incur lot of expenses to retain talented people.

5. SEVERE COMPETITION : There are unimaginable portals for a single product because of that the competition increases .this forces the company to reduce their prices by discounts.

V. TOP E-COMMERCE WEBSITES IN THE WORLD:

1. AMAZON
2. WALMART
3. EBAY
4. TARGET
5. ALIBABA
6. FLIPKART
7. NEWEGG

VI. CONCLUSION:

E-commerce is continuously progressing and is becoming more and more important to **businesses** as technology continues to advance and is something that should be taken advantage of and implemented. From the inception of the Internet and **e-commerce**, the possibilities have become endless for both **businesses** and consumers. However, there are some negatives about e-commerce. Despite security protocols (like HTTPS); businesses with the internet were more likely to be the victims of security loss. Information loss, computer virus, theft/hacking, and manipulating their internal systems, are big issues of today's e-commerce. They try to secure all transactions with SSL (Secure Sockets Layer for private transactions through internet) security standards. Hosting your store in a secure hosting environment or displaying a disclaimer during the checkout process helps to ensure that the visitor is in a safe environment. However, intellectual property protection still seems to be an issue of today. E-Commerce is an evolution that helped our traditional economy adapt to the new digital world, using electronic technology through the internet, resulting in more competitions, more marketplaces, faster transactions, and more advanced technologies to make activities between customers and producers more active. Internet has changed economy so much that most of the business activities today are made in the web. Therefore, we as customers and internet users are responsible to keep our e-commerce healthy and safe so that e-business can be more reliable in the

future. That way, every single person in the world will be able to take advantage of e-commerce.

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Study on Importance of Soft Skills, A pathway for successful career

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ABSTRACT:

This paper makes a survey of the importance of soft skills in students' lives both at college and after college. It discusses how soft skills complement hard skills, which are the technical requirements of a job the student is trained to do. The paper exhorts educators to take special responsibility regarding soft skills, because during students' university time, educators have major influence on the development of their students' soft skills. Embedding the training of soft skills into hard skills courses is a very effective and efficient method of achieving both an attractive way of teaching a particular content and an enhancement of soft skills. Soft skills fulfil an important role in shaping an individual's personality. It is of high importance for every student to acquire adequate skills beyond academic or technical knowledge.

I.INTRODUCTION:

For decades employers as well as educators frequently complain about lack insoft skills among graduates from tertiary education institutions.

Research conducted by Harvard University, the Carnegie Foundation and Stanford Research Centre have all concluded that 85 per cent of job success comes from having well-developed soft and people skills, and only 15 per cent of job success comes from technical skills and knowledge (hard skills).

These statistics were extrapolated from a study published in 1918 by the Carnegie Foundation. For almost 100 years, we learned that soft skills are critical to the success of any organization.

Based on a number of surveys on the skills required by graduates undertaken by Microsoft, Target Jobs, the BBC, Prospects, NACE and AGR and other organisations, the skills which are deemed most important are:

- Ability to express ideas clearly and confidently in speech
- Work confidently within a group
- Understand the commercial realities affecting the organisation
- Gather information systematically to establish facts and principles for problem solving
- Ability to take initiative, identify opportunities and being proactive in putting forward ideas and solutions
- Determination to get things done, make things happen and constantly look for better ways of doing things
- Ability to express thoughts and ideas clearly in writing
- Ability to plan and execute effectively
- Adapt successfully to changing situations and environments
- Manage time effectively, prioritise tasks and work to deadlines

II. WHAT ARE SOFT SKILLS?

Before going any further in debating the importance of soft skills we have to clarify the question "What exactly are soft skills?" This basic question is not easy to answer, because the perception of what is a soft skill differs from context to context. A subject may be considered a soft skill in one particular area, and may be considered a hard skill in another. On top of it the understanding of what should be recognised as a softskill varies widely. Knowledge in project management for instance is "nice to have"for an electrical engineer, but it is a "must to have" for a civil engineer. Training incultural awareness might be useful for a chemist, but it is an absolute necessity forpublic or human resources management in societies of diverse cultures.

Interesting enough the internationally renowned encyclopaedias have little to sayabout soft skills. The online encyclopaedia "Wikipedia" gives a very broad definitionof soft skills, which leaves much room for discussion:

"Soft skills refer to the cluster of personality traits, social graces, facility withlanguage, personal habits, friendliness, and optimism that mark people to varyingdegrees. Soft skills complement hard skills, which are the technical requirementsof a job." (Wikipedia, 2007)

Soft skills are in two types.

Internal Soft Skills:

- Self-confidence
- Self-awareness
- Self-compassion
- Accepting criticism
- Critical thinking/problem solving
- Resilience
- Perseverance
- Emotional management
- Perceptiveness
- Growth mindset
- External Soft Skills

External Soft Skills:

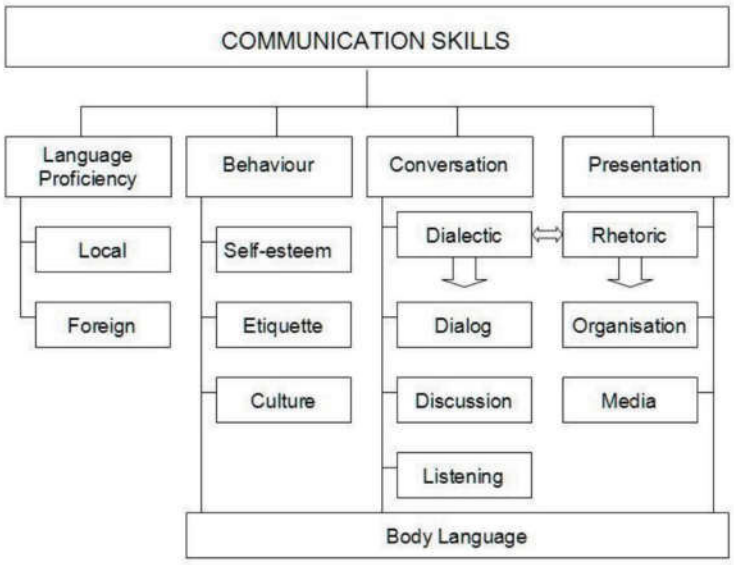
- Collaborative teamwork
- Effective communication
- Interpersonal skills
- Self-Promotion
- Managing conflict
- Adaptability
- Networking
- Influence
- Negotiation
- Expectation management

Above list of examples of soft skills based on the Wikipedia definition.

What are the most important soft skills?

Again the answer regarding the importance of soft skills depends very much onthe context and one's personal perception. However, there is one property thatimmediately comes to most people's mind when soft skills are mentioned: thoseare the communication skills. And indeed, it is the talent of communication skills, which is mostly lacking among graduates from colleges and universities.

When asking people what exactly they understand to be communication skills,one will receive a wide range of answers, because communication skills include a lot of different aspects. Following figure offers an overview of important factors shaping a person's communication skills.



The collection of aspects spans from basic language proficiency, which in multi-lingual societies like Namibia may not be taken for granted, to advanced topics likeDialectic or Rhetoric, which are sophisticated skills in their own right. Minimumrequirements for a graduate of a tertiary institution should be ample proficiencyinspoken and written language, a certain amount of self-esteem that will be reflected in conversation skills and body language, adequate discussion skills,and of major importance, good presentation skills in order to be able to marketoneself and one's ideas. However, communication skills are not only necessary for aperson's professional career, but are even more contributing to one's so-called socialcompetence, a fact which applies to many other soft skills, too. Good social skills arealso reflected at the working place and hence recursively further the career.However, if we continue drilling down deeper into Communication skills theissue will become even more complex. In the English speaking world "Languageproficiency is the ability to speak, read, and write Standard English in a business like
way. One may have the 'hard' skill of knowing what usage is correct and what isincorrect, but lack the 'soft' skills of knowing when to use only standard forms andin what tone to use them." (Waggoner, 2002). In this definition our basic soft skill"Communication Skills" itself is divided into a "soft" and a "hard" part.
Furthermore, adequate communication skills are a prerequisite for a range of othersoft skills like moderating discussions or conflict management.

Another pair of soft skills frequently lacking in tertiary education is critical andstructured thinking. Both go hand in hand with problem solving abilities. Especiallyin today's information society it is of high importance to critically filter the endlessstream of incoming data, analyse it, and make informed decisions based on it.Analytical skills also form the base for developing solutions to any kind of problem.And also in this case the soft skills are of equal usefulness in a person's professionaland private life.

A last soft skill that should be highlighted here is creativity. This skill is oftenmisinterpreted as being only useful for artists, whereas in the science or businessarena only structured logical thinking should be applied. However, this perceptionis wrong. Applying creativity results in "thinking out of the box", which means thatgiven conventional rules and restrictions are left aside in order to find innovativeapproaches to problem solving. If Albert Einstein had not bypassed the guidelinesof Newton's old established physics, and even discarded a bit of common sense,he probably would not have arrived at his revolutionary new view on physics.Brainstorming and mind mapping are well known applications of creativity in the
business world.

III. CAN PERSONAL TRAITS AND HABITS BE CHANGED?

As we recognised earlier, a large part of soft skills relates to personal traits andhabits. Thus, an interesting question to ask is whether a person's traits and habitscan be changed or improved. Anybody raising children or living with a partner whohas irritating habits, might be tempted to answer that the task of changing personaltraits is extremely difficult, if not impossible. The corporate trainer and instructionaldesigner Rukmini Iyer has a strikingly simple answer to this question: "There is alot of argument in industry as to whether it is possible to enhance soft skills in afew hours of training, especially when one considers the fact that a person has livedwith those traits all his life. To this, the answer is harsh but real -- a professional whowants to do well in his / her career does not really have a choice." (Iyer, 2005)

A key aspect in this regard is a person's ability to recognise and acknowledgecertain behavioural shortfalls or plain bad habits. As a German proverb states:"**Self-recognition is the first step towards improvement**". As soon as a deficit hasbeen identified, one can start working on its elimination.

For example, many people are not fond of doing small talk, a common characteristic among those working in a scientific or technical environment. The reasons might vary shyness, introverted character, lack of "how-to", boredom, etc. However, small talk is an important part of the communication skills necessary to display social competence. Once having acknowledged this truth, a person can undergo a simple self-training or guided training to improve the lacking skill. There are for instance many books available on the issue of "Small Talk". Forthwith, the person can make it a habit at parties or social gatherings to initiate a conversation with at least three strangers. While the first times might require quite an effort, after a few months the frequent chatting with strangers will become second nature. With such and similar easy exercises even a very introverted person can appear reasonably sociable.

In summary, it means that negatively perceived personal traits could be changed or successfully covered
by undergoing self-imposed training. The only prerequisite is that one acknowledges one's weakness and takes the decision to change it. Training will most likely be unsuccessful if one is not fully convinced

that it will lead to any improvement or that the improvement will be beneficial.

IV. WHY ARE SOFT SKILLS IMPORTANT?

After having elaborated so much on soft skills, the answer to why they are consideredas being so important is still open. There are numerous reasons for having a criticallook at a person's soft skills.

One straightforward reason is today's job-market, which in many fields is becomingever increasingly competitive. To be successful in this tough environment,candidates for jobs have to bring along a "competitive edge" that distinguishesthem from other candidates with similar qualifications and comparable evaluationresults. And where do they find this competitive advantage? In bringing along
additional knowledge and skills, added up by convincing personal traits and habits.
This sounds familiar.
Understandably, employers prefer to take in job candidates who will be productivefrom a very early stage on. If a graduate from university first has to be trainedon putting more than three sentences together,how to do a proper presentation,or how to chat in a pleasant and winning manner with colleagues andcustomers,this graduate will not qualify as a quick starter. Also basic knowledge in businessmanagement, project management and general economy will improve the chancesof a job candidate considerably.

Already during the job interview itself good communication skills are invaluable.They can even serve to successfully cover up weaknesses on the hard skills side.Don't we all know colleagues who are splendid talkers, but there is no actionforthcoming from their side? The advantages of displaying positive traits likecourtesy, honesty, flexibility, common sense, flawless appearance, etc. during a jobinterview have not even to be discussed.

Vice versa, it unfortunately happens very seldom that a job candidate who wasrejected because of inadequate soft skills is told the truth about the reason forrejection, e.g. "Your body language showed that you seemed to feel very insecure,and you had problems to express yourself and present yourself in a convincingmanner". Even so this evaluation may sound harsh at first glance; this kind offeedback would help a job seeker a lot in improving his/her style for oncominginterviews. However, instead employers usually give no reason or even vaguemisleading reasons for rejections, which are of no help at all for the unluckycandidates.

Once employed, the success story of people who know how to master soft skillscontinues because of much better career opportunities. Simple fact, which can be verified in daily business life, is that employers prefer to promote staff members with superior soft skills. Good hard skills alone are not necessarily enough anymore to be a first choice when it comes to promotion. Soft skills are shaping human beings' personality. Any educator's dream is that graduates, especially from tertiary education institutions, should not only beexperts in a certain field but matured personalities with a well-balanced, roundedoff education.

However, this characteristic is reflected in soft skills, not in hardskills.

During the last decades in many societies the opinion on soft skills has changedconsiderably. Whereas in the past the mastering of hard skills was rated first andsoft skills were considered as "nice to have", the perception has been turned upsidedown. As mentioned before, good communication skills can easily be used to coverup a lack in hard skills. Nowadays in general, people who are extroverted, who aregood in marketing themselves, and who are socialising easily are rated superiorto others who lack those attributes. The good old technician, an ace in his field,but being introverted and talking less than ten complete sentences a day is notappreciated any longer.

This development is not necessarily positive, and it must be allowed to ask thequestion, whether today soft skills are overemphasised.

V. WHERE CAN SOFT SKILLS BE ACQUIRED?

We already identified two methods of learning or improving soft skills. One wayis enrolling for formal training, e.g. taking evening classes on Rhetoric, languages,presentation skills, conflict or cultural management. This is a well-proven conceptwith the advantage of having some kind of certificate at the end of the course, whichmight come in handy for job applications. The slight sarcasm in the last sentence
is intentional, because it is not always guaranteed that a certain course actuallysuccessfully enhanced a person's soft skills.

The other way of acquiring soft skills we looked at is self-training, usually based onbooks. As we saw earlier, changing of personal traits often requires long-term practiceand therefore self-training might be more useful regarding the improvement of thiscategory of soft skills. Additionally, during the last decade another method of self-training has become increasingly popular: Electronic Learning, usually abbreviatedto e-learning. The article "Yes, web based training can teach soft skills" (Horton,2007) emphasises the practicality of this approach.

A very pleasant way of self-training one's soft skills is frequent socialising withfriends, colleagues and other members of society. This may sound astonishing,but meant here is socialising consciously, i.e. with the purpose in mind to enhancecertain soft skills. We know already that in this way we can improve our small talkcapabilities, but there are a lot more soft skills especially related to Communication
skills, which can be practiced while chatting and discussing with others in aninformal manner: e.g. language proficiency in general, listening, discussing,etiquette, self-esteem, or body language.

Hopefully, at most education institutions at all levels teaching methodology hasbeen changed or will be changed towards more student centred learning. Such ashift goes hand in hand with embedding soft skills into the teaching of hard skills.

VI. WHAT CAN LECTURERS DO TO ENHANCE THEIR STUDENTS' SOFT SKILLS?

A first step in improving soft skills of students is to raise their awareness aboutthe importance of soft skills and the consequences of shortcomings in this regard.Students should be encouraged to enhance their soft skills by applying the methodswe mentioned before, e.g. reading dedicated books, attending courses, and joiningclubs or societies to broaden their horizon, like debating societies, Toast Masters
who are practicing Rhetoric, or scientific societies who offer presentations anddiscussions.

A formal approach to the problem would be to incorporate soft skills subjects intoa programme's curriculum. On lower levels a course that requires students to do abit of research and to present their results to the class afterwards has been proven asbeing quite effective. On graduate level a course on management skills, includinge.g. some communication skills together with the management of time, conflict,
cultural issues, and of major importance, oneself, has in practice been well receivedby students.

However, very often the curricula are already overloaded with hard skills courses,making it almost impossible to add or substitute courses. Furthermore, otherlecturers might be ignorant of the importance of soft skills and hence, do not supportdedicated courses in this regard. A very elegant way of offering soft skills trainingto students is to embed it into the teaching of hard skills. This way, no changes
to a programme's curriculum are necessary; instead the change will be reflectedin the lecturers' teaching methodology. An increase in group discussions, lettingstudents do presentations, and using special methodologies like De Bonoor Neuro-Linguistic Programming (NPL)can be applied throughout a course. This approachto practicing soft skills requires some re-thinking and re-planning of existing hard
skill courses. During a presentation at the Polytechnic of Namibia Professor RobKruegeroffered an interesting approach to the problem by turning the purpose ofa lecture upside down, i.e. making the content of a lecture the vehicle to teach softskills. An example would be a mathematics teacher who plans a lecture by firstlydetermining what soft skills s/he wishes to enhance on that day, and then secondly
considers how the required mathematics content can be arranged to support thisgoal. Correctly applied, such an approach to teaching will automatically increasethe attractiveness and effectiveness of a course regarding both, hard skills and softskills.

VII. CONCLUSION

Considering the fact that during the last decades in society the perceived importanceof soft skills has increased significantly, it is of high importance for everyone toacquire adequate skills beyond academic or technical knowledge. This is notparticularly difficult. Once a shortcoming in a certain area of soft skills has beenidentified at oneself, there are numerous ways of rectifying such a deficiency.Educators have a special responsibility regarding soft skills, because duringstudents' School and University time they have major impact on the developmentof their students' soft skills. Besides raising awareness regarding the importance ofsoft skills and encouraging students to improve their skills, lecturers

should activelypractice soft skills with their students. A very effective and efficient way of doingthis is to include soft skills training into the teaching of hard skills. As a positiveside effect the lessons will become more attractive, which in turn will increase thesuccess rate of learners.

Soft skills fulfil an important role in shaping an individual's personality bycomplementing his/her hard skills. However, over-emphasising it to such an extentshould not taint the importance of soft skills, that hard skills, i.e. expert knowledgein certain fields, are demoted to secondary importance.

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RECRUITMENT AND SELECTION

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ABSTRACT

Everything you need to know about the recruitment and selection process in HRM. One of the main recruitment and selection is Human resource planning ensures that right kind and right quality of employees are employed so as to achieve the organizational goals. Recruitment and selection are the two crucial steps in Human Resource process. Recruitment is an activity of establishing contact between employers and applicants. Selection is a process of picking up more competent and suitable employees.

I. KEY WORDS

Recruitment, Selection, Candidates, Organization, Jobs, Factors, Interviews

II. INTRODUCTION

The importance of ensuring the selection of the right people to join the workforce has become increasingly apparent as the emphasis on people as the prime source of competitive advantage has grown. Beaumont (1993) identifies three key issues that have increased the potential importance of the selection decision to organizations. First, demographic trends and changes in the labour market have led to a more diverse workforce, which has placed increasing pressure on the notion of fairness in selection.

Second, the desire for a multi-skilled, flexible workforce and an increased emphasis on team working has meant that selection decisions are concerned more with behavior and attitudes than with matching individuals to immediate job requirements. And third, the emphasis between corporate strategy and people management has led to the notion of strategic selection: that is, a system that links selection processes and outcomes to organizational goals and aims to match the flow of people to emerging business strategies.

Selective hiring (i.e. the use of sophisticated techniques to ensure selection of the 'right' people) is frequently included in the 'bundles' of best HR practice (see, for example, Pfeffer, 1998). The contribution of effective recruitment and selection to enhanced business performance is also illustrated by the findings of empirical studies.

For example, a study into small and medium-sized manufacturing establishments

(Patterson et al., 1997) found the acquisition and development of employee skills through the use of sophisticated selection, induction, training and appraisals to have a positive impact on company productivity and profitability. Thus the practice of recruitment and selection is increasingly important from an HRM perspective.

At the same time, however, many of the traditional methods of recruitment and selection are being challenged by the need for organizations to address the increased complexity, greater ambiguity and rapid pace of change in the contemporary environment. This chapter, therefore, discusses key contemporary approaches to recruitment and selection, and examines the influence of external and internal factors on the process. After clarifying what we mean by recruitment and selection, we begin by describing the external context in which recruitment and selection occur, including government policy and legislation.

Next, we turn our attention to the internal organizational context in order to examine factors that might account for variations in recruitment and selection practice. We then explore the systematic approach to recruitment and selection, and discuss recent developments at each stage of the process. In the final section we emphasis the two-way nature of recruitment and selection, and consider ethical issues in the treatment of individuals. The chapter concludes with a summary and a number of self-test exercises.

III. DEFINITION

The recruitment and selection process is concerned with identifying, attracting and choosing suitable people to meet an organization's human resource requirements. They are integrated activities, and 'where recruitment stops and selection begins is a moot point' (Anderson, 1994). Nevertheless, it is useful to try to differentiate between the two areas: Whitehill (1991) describes the recruitment process as a positive one, 'building a roster of potentially qualified applicants', as opposed to the 'negative' process of selection.

So a useful definition of recruitment is 'searching for and obtaining potential job candidates in sufficient numbers and quality so that the organization can select the most appropriate people to fill its job needs' (Dowling and Schuler, 1990); whereas selection is concerned more with 'predicting which candidates will make the most appropriate contribution to the organization – now and in the future' (Hackett, 1991)

IV. PRINICIPLES OF RECRUITMENT AND SELECTION

When focusing on the recruitment and selection of employees for your business, there are some general considerations you should always keep in mind:

- The first point to recognize about recruitment is that it is a process with a number of key stages, all of which combine to enhance your chances of finding the best

candidates available for any advertised position.

- It is also worth pointing out that in terms of leading and managing employees if you are not recruiting the best people available, then it is always going to be an uphill struggle to manage them day-to-day.
- Another general rule is that when seeking to fill any vacancy you should always consider the internal candidates that could be promoted to the available post and then recruit externally for the more junior position.
- Too often senior managers pay scant attention to the recruitment process and only become actively involved when a senior post is being filled, or at the end of the process for a quick 'final' interview. This is a mistake and you should be concerned with the quality and suitability of every employee who joins your business.
- It is often assumed that interviewing is something that any experienced manager can do. Again, this is a mistake: yes, anybody can conduct an interview, but few can do it well unless they are appropriately trained. Nobody in your business should conduct interviews without adequate training.
- There are many legal issues associated with the recruitment process and you should familiarize yourself with all relevant legislation.

The principle objective of the recruitment process should be to recruit, select and appoint employees appropriate to the present and future needs of your business.

V. FACTORS AFFECTING RECRUITMENT AND SELECTION:

Recruitment is a significant purpose of the Human Resource Management in a business, and it is ruled by a combination of numerous factors. Active HR Professionals must understand these factors manipulating the recruitment and take required actions for the improvement of the business.

At times when market condition changes, the organization also wants to screen these alterations and learn how it have emotional impact the incomes and analyze these functions for making recruitment an real process.

We have Internal Factors as well as External Factors that affect the recruitment procedure. In this we will be debating these factors in detail.

➢ INTERNAL FACTORS:

Organizations have control over the internal factors that affect their recruitment functions. The internal factors are −

- Size of organization
- Recruiting policy
- Image of organization
- Image of job

• SIZE OF ORGANIZATION:

The most significant issues moving the recruitment process are to expand the size of the organization, recruitment planning is

compulsory for hiring more resources, which will be handling the future operations.

- **RECRUITING POLICY:**

Signing from internal or external bases of group is also a factor in recruitment policy of an organization, which touches the recruitment process. It states the purposes of the recruitment and offers a framework for the application of recruitment programs.

- **IMAGE OF ORGANIZATION:**

Organizations having a decent positive image in the market can effortlessly entice competent resources. Keep up good public relations, given that public services, etc., certainly helps an organization in improving its standing in the market, and thereby appeal to the best likely resources.

- **IMAGE OF JOB:**

Just like the image of the institute, the image of a job plays a precarious role in employment. Jobs having a positive brand in terms of better payment, advancements, credit, and good work environment with career growth opportunities are considered to be the characteristics to entice qualified candidates.

- **EXTERNAL FACTORS:**

External factors are individuals that cannot be measured by an organization. The external factors that disturb the recruitment process include the resulting −

- **DEMOGRAPHIC FACTORS** − Demographic factors are associated to the features of possible employees such as their age, religion, literacy level, gender, occupation, economic status, etc.
- **LABOR MARKET** − Labor market panels the demand and supply of labor. For instance, if the supply of people having a precise skill is less than the demand, then the employing will need more hard work. On the other hand, if the demand is less than the supply, the hiring will be relatively easier.
- **UNEMPLOYMENT RATE** − If the unemployment rate is high in an exact area, hiring of capitals will be simpler and easier, as the number of candidates is very high. In contrast, if the unemployment rate is low, then recruiting tends to be very difficult due to less number of resources.
- **LABOR LAWS** − Labor laws replicate the social and political surroundings of a market, which are produced by the central and state governments. These laws command the compensation, working environment, security and health regulations, etc., for dissimilar types of employments. As the government changes, the laws to change.
- **LEGAL CONSIDERATIONS** − Job reservations for different castes such as STs, SCs, OBCs are the best instances of legal concerns. These concerns, passed by government, will have a positive or negative impact on the recruitment policies of the organizations.

- **COMPETITORS** – When governments in the similar business are contending for the best capable resources, there is a requisite to examine the competition and offer the resources packages that are best in terms of industry values.

VI. RECRUITMENT AND SELECTION PROCESS

The five steps involved in recruitment process are as follows:

(i) Recruitment planning (ii) Strategy Development (iii) Searching (iv) Screening (v) Evaluation and Control.

TYPES OF RECRUITMENT AND SELECTION

In this chapter, we will shed some light on the confidences of hiring and employing methods, used by the recruiters. Recruitment is approximately classified into two different categories − Internal Sources and External Sources.

➢ INTERNAL SOURCES OF RECRUITMENT:

Internal bases of employment refer to appointment employees within the group internally. In other words, candidates looking for the diverse positions are those who are presently employed with the similar organization.

At the time recruitment of teams, the initial contemplation should be given to those staffs who are presently working within the organization. This is an significant source of staffing, which delivers the chances for the growth and utilization of the current resources within the organization.

Internal sources of recruitment are the best and the coolest way of choosing resources as presentation of their work is previously known to the organization. Let us now debate more on the numerous internal sources of recruitment.

- **PROMOTIONS:**

Promotion refers to advancement the team of the employees by estimating their presentation in the organization. It is the procedure of shifting an employee from a lower position to a higher position with more tasks, remuneration, facilities, and status. Many organizations fill the higher vacant positions with the process of promotions, internally.

- **TRANSFERS:**

Transfer refers to the procedure of switching from one job to another without any alteration in the rank and duties. It can also be the shifting of employees from one department to another department or one location to another location, depending upon the requirement of the position.

Let's take an instance to know how it works. Take on there is a financial corporation called ABC Ltd. Having two branches, Branch-A and Branch-B, and an employee from Branch-A accepting from his job accountabilities. Therefore, this position has to be occupied for the continuance of the project with Branch-A. In this situation, as a substitute of searching or sourcing new candidates, which is time consuming and costly, there is an opportunity of shifting an employee from Branch-B to Branch-A, contingent upon the project necessities and the proficiencies of that respective employee. This internal shifting of an employee from one branch to alternative branch is called as Transfer.

- **EXTERNAL SOURCES OF RECRUITMENT:**

External bases of recruitment refer to hiring staffs outside the organization outwardly. In other words, the candidates seeking job chances in this case are those who are external to the organization.

External employees carry innovativeness and fresh opinions to the organization. Though hiring over external sources is a bit costly and tough, it has marvelous potential of driving the organization forward in achieving its goals. Let us now debate in detail the numerous external sources of recruitment.

- **DIRECT RECRUITMENT**

Direct recruitment mentions to the external source of employment where the recruitment of experienced candidates is done by assigning a notice of opportunity on the notice board in the organization. This technique of sourcing is also called as factory gate recruitment, as the blue-collar and technical workers are hired over this process.

- **EMPLOYMENT EXCHANGES**

As per the law, for definite job vacancies, it is compulsory that the organization offers details to the employment exchange. Employment exchange is a government object, where the particulars of the job seekers are stored and given to the bosses for filling the vacant positions. This external recruitment is cooperative in hiring for inexpert, semi-skilled, and skilled workers.

VII. CONCLUSION

An effective recruitment and selection process reduces turnover, we also get much better results in our recruitment process if we advertise specific criteria that are relevant to the job. Failure to recruit and select for the long term can result in high turnover. The recruitment and selection process is the time we not only identify a candidate who has the experience and aptitude to do the job that we are looking to fill, but also to find someone who shares and endorses our company's core values. The candidate will need to fit in well within our company's culture. The selection and recruitment process should provide our company with an employee who adapts and works well with others in our business.

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CONSULTANCY MANAGEMENT – CRITERIA OF MARKETING STANDARDS

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ABSTRACT: The observation that impacts on management consultants help businesses improve their performance and grow by solving problems and finding new and better ways of doing things. It's not just in the private sector either many firms work with public sector organizations to help develop their services and, where necessary, reduce costs and make savings. As a consultant works as n a nutshell, and provide expert opinions, analysis, and recommendations to organizations or individuals, based on their own expertise. They're essentially fixers, serving as objective troubleshooters, and providing strategies to prevent problems and improve performance. Knowledge being democratized and information becoming more and more accessible to anyone, the role of management consultants is rapidly changing.

KEY WORDS: Consultancy, research and survey, organization growth, SWOT Analysis

I.INTRODUCTION: A consultant usually an expert or professional in a specified filed and has wide knowledge of the subject matter. The first is to provide expert advice in the areas in which we specialize. The experience of our professional consultant's means that are ideally placed to provide our clients with the knowledge, information and advice they required consulting or consultancy firm is a business of one or more experts (consultants) that provides professional feedback to an individual or an organization for a fee. The deliverable of a consultant is usually advice or a recipe to follow to achieve a company objective, leading to a company project. Consultant will be to work in partnership with clients, advising

them how to use information technology in order to meet their business objectives or overcome problems. It will work to improve the structure and efficiency of information technology systems in various organizations. Principle or practice, which is generally accepted between practitioners and academics as an integral part of the marketing concept and/or the marketing management processes, and conform to integrity and ethical conduct in the profession of marketing. *ref [1]*

II. **STANDARDS – TREND:**

Criteria regarding to estimating the Standards in Present Market

i. Information regarding the market and competition – estimating / predicting the situation,

ii. Analyzing the price criteria as a part of SWOT Analysis,

iii. Product / Service Management,

iv. Planning – Short term/ long term

v. Budgeting,

vi. Promotion - project to the client / customer,

vii. Enchasing the product for next attempt,

viii. Accepting the change or feedback for betterment

The standards will provide a framework and reference for training programs and marketing designations *ref [2]& ref [8]*

III. CONSULTATION & TYPES:

Expert Model: It is a model of telling, assuming and selling as per the client perception or giving expert service or information, the buyer is an individual manager or representative of some group in an organization it defines a needed and concludes that the organization has neither the resource nor the time to fulfill that needed. This model is almost by definition totally content oriented.

Assumptions:

- Whether or not the manager has correctly diagnosed his own needs
- Regarding the content communicated in proper way or not
- Requirements were accurately assessed the capabilities of consultant to provide the information service
- Consequences of having the consultant gather information or implementing the changes as per marketing standards
- Whether or not external reality than objective studied

Doctor - Patient Model: The core of this model is that client experience some symptoms that something went wrong but does not have due as how to go about figuring out what is wrong or how to fix it. This process is delegate completely to the consultant along with obligation to come up with a remedy, in this scenario client is totally depend up on consultant until such a time as the consultant make a prescription, unless consultant engages the client in becoming more active.

Assumptions:

- It is testing and supporting process after the deployment for resolving the issues
- Client has correctly interpreted the symptoms of sick ' area"
- Client has thought the consequences i.e., is willing to accept and implement whatever remedy given
- If the result is success the attempt is success

Process Consultation: It is the creation of relationship with the client that permits the client to perceive , understand and act on the process events that occur clients internal and external environment in order to improve the situation as defined by the client. *ref[3]*

Key Focus Areas of Process Consultation

- It build a relationship and permits consultant and client to deal with reality
- Remove the area of ignorance
- Acknowledge the consultant behavior's as being always on intervention
- Help the client to figure out what they should do about the situation

Assumptions

- Client not only needs help in making an initial diagnosis but it would be benefit from the participation in the process of decision making
- Constructive intent and some problem solving – logical mindset for approaching the problem solving issues
- That the client is ultimately the only one who knows what form of solution will work *ref [4]*

IV. **PRINCIPLES OF CONSULTATION**:

- Always try to gather the information past present for designing the future instance as per market standards
- Staying with reality avoiding the gossips and wastage
- Access to the ignorance and accepting the feedback
- Importance to the Time Management
- Problem and solution
- Continuity and should go with the flow
- Sharing the problem regarding the doubt and getting the " Clarity of thought" *ref [7]*

V. **ROLES AND RESPONSIBILITIES:**

- Conducting research, surveys and interviews to gain understanding of the business
- Analyzing statistics
- Detecting issues and investigating ways to resolve them

- Assessing the pros and cons of possible strategies
- Compiling and presenting information orally, visually and in writing
- Making recommendations for improvement, using computer models to test them and presenting findings to client
- Implementing agreed solutions
- Developing and implementing new procedures or training. *ref[5]*

VI. KEY SKILLS:

- Commercial awareness
- Good numerical skills
- Attention to detail
- Analytical skills
- Excellent interpersonal skills
- Tact and persuasive ability
- Team working skills
- IT skills
- Good oral and written communication skills
- Self-motivation *ref [6]*

VII. CONCLUSION: Consultants offer advice and expertise to organizations to help them improve their business performance in terms of operations, profitability, management, structure and strategy by basing marketing standards. Although the workload can be heavy, consulting is a sociable profession with plenty of networking opportunities. The work stretches across a variety of areas, including management, strategy, IT, finance, marketing, HR and supply chain management.

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CORPORATE SOCIAL RESPONSIBILITY AND EMPLOYEE ENGAGEMENT

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Abstract

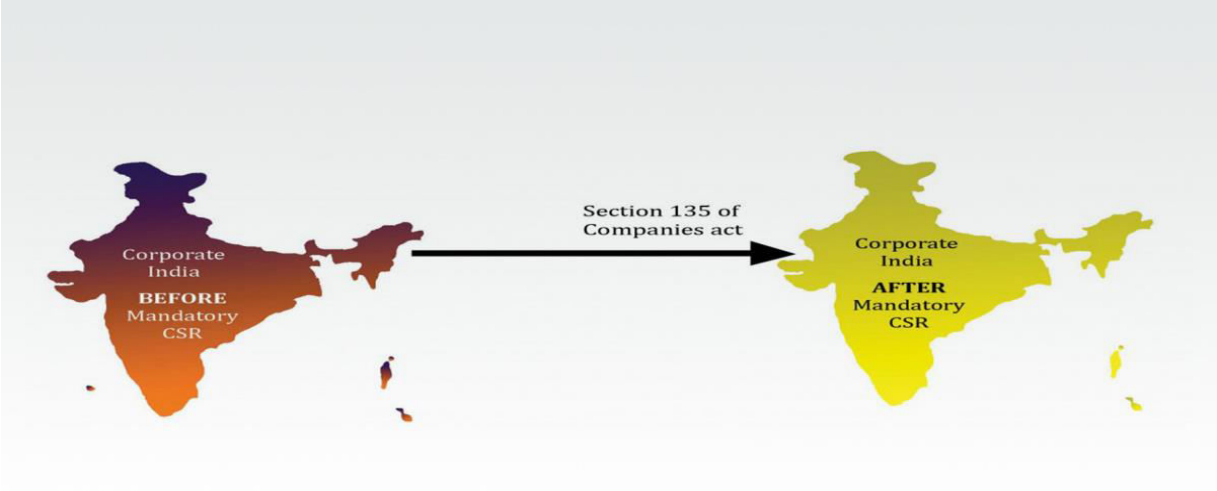
Corporate Social Responsibility is the way through which corporate companies address the every stakeholder. Corporate Social Responsibility moving far ahead from its age old domain of charity has now reached to a new mark of corporate responsiveness and action to social issues and sustainability in order to advance further towards a new era of collective future action for factoring the sustainable business strategy and development of the society. The purpose of this paper is to know the reasons for growth of CSR in India and to know what potential benefits of CSR to companies are. This paper also looks at a new framework for employee engagement and its practical applications and benefits for communities and corporations. Employee Engagement through service learning in executive development programs and innovative corporate-community volunteerism highlight how this can depend employees' identities as corporate citizens.

Introduction

In moderns days it not enough for businesses to simply buy and sell their products and services without considering the world in which they operate. The term "corporate social responsibility" came into existence in the late 1960s and early 1970s after many multinational corporations formed the term stakeholders, meaning those on whom organization activities have an impact. . It was used to describe corporate owners beyond shareholders as a result of an influential book by R. Edward Freeman, Strategic Management: Companies must voluntarily do business in an economically, socially and environmentally responsible manner to be sustainable for long term. Corporate social responsibility refers to business practices involving initiatives that

benefit society and its people. A business's CSR can encompass a wide variety of tactics, from giving away a portion of a company's proceeds to charity which benefits society to implementing "greener" business operations. The concept of CSR rests on the ideology of give and take. Companies take resources in the form of raw materials, human resources etc from the society. By performing the task of CSR activities, the companies are giving something back to the society (Companies Act 2013 (Companies Act) according to this act it is mandatory to every company to practice CSR in INDIA. CSR policy functions as a built-in, self –regulating whereby business monitors and ensures its active compliance with the power of the law, standards, and norms.

CSR in INDIA



India is the first country in the world to make corporate social responsibility (CSR) mandatory, following an amendment to the *Companies Act, 2013* in April 2014. Businesses can invest their profits in areas such as education, poverty, gender equality, and hunger as part of any CSR compliance.

The amendment notified in *the Companies Act, 2013* requires companies with a net worth of INR 500 crore (US $70 million) or more, or an annual turnover of INR 1000 core (US $140 million) or more, or net profit of INR 5 crore (US $699,125) or more, to spend 2 percent of their average net profits of three years on CSR.

Prior to that, the CSR clause was voluntary for companies, though it was mandatory to disclose their CSR spending to shareholders. CSR includes but is not limited to the following:

- Projects related to activities specified in the Companies Act; or
- Projects related to activities taken by the company board as recommended by the CSR Committee, provided

those activities cover items listed in the Companies Act.

The methodology of CSR

CSR is the procedure for assessing an organization's impact on society and evaluating their responsibilities. It begins with an assessment of the following aspects of each business:

- Customers;
- Suppliers;
- Environment;
- Communities; and,
- Employees.

The most effective CSR plans ensure that while organizations comply with legislation, their investments also respect the growth and development of marginalized communities and the environment. CSR should also be sustainable – involving activities that an organization can uphold without negatively affecting their business goals.

Organizations in India have been quite sensible in taking up CSR initiatives and integrating them into their business processes.

It has become progressively projected in the Indian corporate setting because organizations have recognized that besides growing their businesses, it is also important to shape responsible and supportable relationships with the community at large.

Companies now have specific departments and teams that develop specific policies, strategies, and goals for their CSR programs and set separate budgets to support them.

Most of the time, these programs are based on well-defined social beliefs or are carefully aligned with the companies' business domain.

Employee Engagement and CSR

Most companies today are doing something to engage their employees. The "war for talent" has seen employers pitch starting bonuses, flexible hours, challenging projects, the latest mobile technology, and amenities ranging from a concierge service

to health club memberships in hopes of attracting young talent and retaining "high-potentials" who might otherwise look elsewhere. This is certainly a step up from treating employees like expendable parts that could be replaced without a second thought. And it works: but only up to the point that another employer offers the same or better incentives or until the economy goes into recession and employers cut out the frills. Over the past few years, corporate social responsibility (CSR) has been heralded as a new "tool" to recruit and retain employees. Because (2006) Cone found that three of four of the generation (born 1978 to 1998) want to work for a company that "cares about how it impacts and contributes to society and its people." It is also found that, among those already in the workforce, nearly seven in ten say that they are aware of their employer's commitment to social/environmental causes, and 65 percent say that their employer's social/environmental activities make them feel loyal and responseble to their company.

Why Add CSR to Employee Engagement?

Why would a company concern itself with and seek to activate the people's identities as citizens of a corporation, community, society and group ? One reason is that when employees find that their company welcomes the full range of their interests and aspirations, including, for instance, a personal desire to serve society and/or protect the envoriment, they feel welcome to bring their "whole selves" into the workplace. This brings more commitment to one's work, a deeper connection to a company, and a broader sense of meaning associated with one's job and employment. As an example, leading CSR companies regard employees as important stakeholders who express their voices not only in employment and practices in nature, also on social issues related to employment. These firms have diversity councils, work/family forums, and associations of minorities, women, and gay/ lesbians, whereby employees can share their interests. These affinity groups not only provide input to and feedback on company policies and practices, but they also influence public positions taken by their firms.

- Witness, as an example, the increasing number of companies in the USA taking an stand on gay rights or joining forces with other firms in a coalition of businesses, Voices for Working Families, to promote work and balance family.
- A second reason is that when employees feel free to bring these multiple identities into the working place , they become a microcosm of the markets and societies in which a firm operates. Recognizing the, top companies like IBM in its Innovation and Nokia in its World Map exercise, regularly consult with employees on social and factor their ideas not only employment policies, but also into corporate social responsibility, business innovations, and their overall socio-commercial agenda.
- A third reason is that employees their identities, whether enhanced or diminished by their companies, into society and the market. Studies find that the prime source of information about the citizenship of companies comes via word of mouth. Employees wants to live and work responsibly and fulfill through their companies thereby serve as effective

brand ambassadors for their firms through their word-of-mouth commentary. They also produce social capital—a web of positive relevant relationships—that connects their companies to other stakeholders and the public at large.

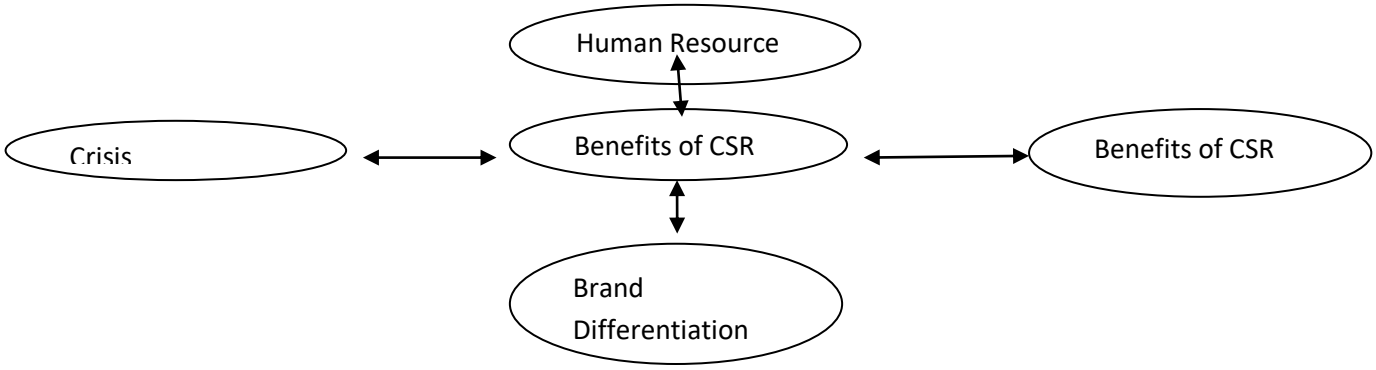
Finally, employees who feel empowered as citizens produce social value through their volunteer service, their jobs, products, and services, and the enriched understandings of corporate citizenship that are shared with friends, a subject of debate among colleagues and critics, and ultimately passed on to their children.

Engaging Employees Through CSR: Volunteerism

Leading companies in world actively engage every employees in CSR programs and often this takes the form of volunteerism, especially relevant for Indian employees, but of increasing interest to working people around the world.

- Cause effective configuration:
  Focus on causes to the business; leverage skills and other company assets (commercial products); partner where appropriate with a nonprofit service arm. This makes the community service seem "serious" rather than a "day off " to the employees.
- Strategic business positioning:
  Integrate volunteerism into the larger CSR thrust of the company; connect to business goals; manage the volunteer service effort professionally. This ensures that employee volunteerism "makes a difference."
- Sufficient investment:
  Add treasure to talent.
- Culture of engagement:
- Encourage and support volunteerism; senior management of companies modeling; middle management buy-in. This makes community service something that "we all do."
- Strong participation:
  Large numbers; paid time off; media coverage. This sends a message that volunteerism matters.
- Actionable evaluation:
  Track numbers, hours; feedback from volunteers and those they serve; business and social outcome measurement. Excellence matters, too, not just "showing up."

Potential business benefits of CSR



The nature of benefits of CSR for any organization can vary depending on the nature of the enterprise. The business case for CSR within a company will likely rest on one or more of these arguments.

1. Human resources
   A CSR programme can help to recruitment and retention of humane resource. Potential recruits often ask about a firm‘s CSR policy during an interview, and having a comprehensive policy can give an advantage.
2. Crisis management
   Managing crisis is a important part of many corporate companies strategies. Reputation take decades to build up and can be ruined in hours through incident such as corruption or environmental accident. These can draw attention from regulators, courts, governments & media. Building a genuine culture of doing the right thing within a corporation can offset these risks.
3. Brand differentiation
   In large market places, company‘s striving for a unique selling point. CSR affects brand differentiation through customer preference and employee engagement. CSR also helps in building customer loyalty based on ethical values.
4. License to operate
   Corporation are keen to avoid interference in business through taxation. By taking voluntary steps, they can tell governments that they are taking issues such as health & safety, diversity, or the environment seriously as good corporate citizen for positive impact on the environment. CSR remains essential to building and maintaining a strong brand image and goodwill. A CSR initiative also helps in protecting a company from harm during a controversial or challenging event

Conclusion

CSR have no boundaries and are not constrained by race, color, or religion. Sadly, concern for the community is often mistaken for socialism. On the contrary, every citizen is an asset in economic activity and has opportunities to succeed. This invisible culture can shape brighter future for nations. Organizations must realize that government alone will not be able to get success in its endeavor to uplift the down trodden of society. The present societal marketing concept of companies is constantly evolving and has given rise to a new concept- CSR. Many of the leading corporations across the world had realized the importance of being associated with socially relevant causes as a means of protecting the goodwill and reputation, defending attacks and increasing business competitiveness. It stems from the desire to do well and get self-satisfaction in return as well as societal obligation of business. There is also budding interest in companies (and certainly among employees) in what might best be called "socially responsible jobs." Long ago employers learned of the advantages of job enrichment—whether in the form of more variety, autonomy, and challenge or in opportunities for influence over how the job is done. Employee engagement via CSR enables employees to affirmatively answer some of these questions. A study by the National Environment Education Foundation (2010) finds that employee education and engagement efforts aimed at "greening" their companies have paid big dividends.

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OCCUPATIONAL STRESS AMONG EMPLOYEES EMPLOYED IN VARIOUS INDUSTRIES- A LITERATURE REVIEW APPROACH

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ABSTRACT

Stress is unavoidable in the present situation. It isn't limited to one's who feel it rather has become an open issue and is looking for consideration from individuals around. Every individual hold diverse view about worry as it very well may be experienced from assortment of sources. Indian advanced education segment is moving towards instruction industry where private players are thinking of innovation based instructive procedures. Instructing is naturally a distressing occupation, and by numerous records, it's getting all the more so. Research has shown that police pressure antagonistically influences the official's social emotionally supportive networks, for example, marriage and family and other social connections.

Key words: occupational stress, stress, burnout, emotional intelligence, work life balance

1. Introduction

Stress is unavoidable in the present situation. It isn't limited to one's who feel it rather has become an open issue and is looking for consideration from individuals around. Every individual hold diverse view about worry as it very well may be experienced from assortment of sources. However, worry for pressure has expanded these days with expanding worry about work life parity and personal satisfaction. Indeed, even the quick changes are found in the social arrangement of Indian culture where progressively joint families are separating into family units and there is a weight of family obligation on one shoulder. Urbanization, station framework, political impacts, and quick industrialization are for the most part assuming its job in expanding distressing conditions for the network on the loose. Cases for pressure are twice as high as those paid for non stress physical damage at the work place, acquiring a yearly cost of about $200 billion as cited by Agrawal (2001). A gigantic weight is made upon the people because of blend of way of life issues and in general ecological pressure prompting ceaseless diseases like coronary episodes, expanding blood pressures and mental issues like sadness and suicides. These issues are intently interlinked to pressure. It is very much recognized that downturn impacts the event of different infections. In India, around 57% of the individuals are influenced by wretchedness according to the distribution by WHO. The psychological weight that is made because of different powers impacting an individual is offering ascend to burdensome issue, uneasiness issue, sedate use issue, schizophrenia. PM Narendra Modi in his discourse through Mann ki Baat Radio on March 27, 2017, encouraged Indians to discuss melancholy and look for help if necessary. It isn't amazing that pressure has raised dynamically in the course of recent decades stamping it as a subject hard to keep away from. One needs to give due consideration regarding pressure and its negative results.

Because of changes in the idea of work and expanding rivalry, individuals need to manage expanding business related pressure which is felt because of the distinction between the requests and weights at the work place and the human propensity to adapt to it. Great associations are accepting this issue as a test and are contemplating the repercussion it might bring. Worry in the working environment is basic all through the world in each industry and every one of the associations. There are number of stressors that influence the presentation and character of a person. Change in the workplace may fuel worry for certain people while some might be influenced by the advantages. Down to earth information and accessible writing for various divisions like Banking, IT, Healthcare and Education pointed worry as one of the most persuasive factor influencing the fulfillment level of the representatives at the working environment

2. Occupational Stress among university teachers and school teachers

In the ongoing period of expanding rivalry, Indian advanced education segment is moving towards instruction industry where private players are thinking of innovation based instructive procedures. Instructing is naturally a distressing

occupation, and by numerous records, it's getting all the more so. Understudies carry the dangers of innovation to the homeroom and its getting troublesome nowadays to keep power over the equivalent. Study hall conduct is reliably refered to as one of the principle drivers of instructor worry alongside the remaining task at hand. Scientists have reliably inferred that showing is a distressing occupation, and that a critical number of educators, maybe even a dominant part, are influenced by business related worry as closed by Rudow (1999); Dunham (1998); Kyriacou (1989). Instructor stress might be characterized as a reaction disorder of negative impact coming about because of parts of the educator's activity and interceded by the observation that the requests made upon the instructor comprise a risk to their confidence or prosperity as proposed by Kyriacou and Sutcliffe (1978) in their investigation.

Indeed, even work life balance among educators has gotten perhaps the best challenge in the present time. The associations managing in higher learning are quickly incorporating the trend setting innovation with the assistance of ICT into showing learning process. The unexpected change in the requests to keep up the instructive limits through innovative headways, is putting overwhelming weight on training experts making awkwardness in their family life. Because of such requests, the idea of Work life balance has gotten vital for instructing experts to adapt to the unsure condition in the instructive set up. Instructors are required to spend additional hours to be powerful in their job. This calling doesn't just concentrate on instructing through ones specialized information yet in addition requests a solid hold over delicate aptitudes and fundamental abilities which can cook towards the satisfaction of instructive objectives. On the off chance that educators are focused and incapable to adjust their work and family, their presentation in class will be influenced and eventually it'll impact the mass. As per Guest (2002), the explanations behind the ascent of concern with respect to work-life balance are the weight and heightening of work, expanding center around nature of home and network life and the frames of mind and estimations of individuals. This thusly prompts huge ascent in medical issue, which thus monetarily influence both the business just as the administration as recommended by Frone et al. (1997).

In numerous nations educating is frequently considered as one of the most unpleasant calling. As per Kyriacou (2000) educators stress can be characterized as "the experience by an instructor of unsavory negative feelings, for example, outrage, dissatisfaction, uneasiness, misery and apprehension, coming about because of some part of their work". Kyriacou and Schutcliffe characterized educators worry as, " a reaction disorder of negative impacts, (for example, outrage or sadness) typically joined by possibly pathogenic physiological changes, (for example, expanded pulse) coming about because of parts of the showing work and intervened by the recognition that requests made upon instructor comprise a risk to his/her confidence or prosperity and by methods for dealing with stress

actuated to diminish the apparent threat." Vandenberghe (1999) states that, instructors stress is the "general term to portray negative feelings of educators that are reflected in aversive requests to their work".

Banerjee, S., and Mehta, P. (2016) in their investigation worked after securing the forerunners of position pressure and their impact on work execution as far as both disappointment and shirking among the employees. The information was gathered from 110 staff educating in B-Schools in Andhra Pradesh. Factor Analysis was performed to distinguish significant factors influencing feeling of anxiety and Regression examination was done to discover the effect of weight on work execution. The outcomes uncovered that instructing pressure prompts work evasion, while work over-burden pressure and poor relational connections lead to work disappointment.

Luhar U., Dr. Vaghela K. (2016) in their investigation attempted to quantify the feelings of anxiety among the instructors and the police officers. Since educators stress has been a worry in the ongoing time and the police officers likewise need to work for the prosperity of the residents nonstop, these two divisions were chosen with the end goal of study. 30 instructors and the 30 cops from Amreli locale were grilled with the assistance of a poll confined by utilizing Occupational Stress scale by A.K. Shrivastav and Singh (1981) and Job Satisfaction scale by Parikh (1985). T-test was utilized as a factual measure to arrive at the resolution. The outcomes demonstrated that there is a noteworthy contrast between the degrees of worry as experienced by the educators and the individuals from the Police office. Additionally it was discovered that there is a distinction in the activity fulfillment level among both the offices.

Sabherwal, N., Ahuja, D., George, M., and Handa, A (2015) directed an investigation on word related worry among employees in Higher Education Institutions in Pune. Their investigation comprised of (N=200) educators of various higher instructive foundations in Pune. The aftereffects of the investigation demonstrate that absence of standard breaks (85%) and long working hours (83%), provocation by chiefs/staff/understudies (75%), absence of correspondence with staff (73%), poor compensation possibilities (81%) pace and force of progress (75%), high level of vulnerability about work cause greatest pressure. Additionally Age, Gender and Marital status impacts the degree of stress looked by the employees and the theory of work requests, connections at work, work jobs, work changes and bolster related components influence feeling of anxiety among personnel was acknowledged.

Visotskaya, N., Cherkashina, E., Katcin, O., and Lisina, L. (2015) in the examination entitled Studies on University Professors' Emotional Burnout' inspected passionate burnout disorder among the University educators of the Department of Transport in Siberian Federal University. Distinctive indicative tests and surveys were utilized to uncover the level of passionate burnout and expert burnout among 22 instructors managing

philanthropic and designing subjects. Mann Whitney U-test was applied to discover the contrast between the gatherings under examination in connection to the qualities of their expert action. Side effects of pressure improvement were ordered into 3 phases of Tension, Resistance and Exhaustion. The outcome uncovered that the passionate burnout manifestations among the speakers of compassionate subjects at the pressure' organize are distressing experience, feeling cornered, nervousness and misery where as at the obstruction' arrange incorporates deficient enthusiastic response and passionate and moral bewilderment. Passionate shortfall, enthusiastic and individual separation is common at the weariness' arrange prompting encountering more passionate burnout than instructors of building subjects. It was additionally discovered that each phase of passionate burnout is either in procedure of development or it is as of now shaped and is because of expert exercises of the subjects.

An examination on the components affecting occupation fulfillment of MBA employees in Gujarat state‖ was directed by Dave, N., and Raval, D. (2014) with the goal of estimating the legitimacy of different elements that influence the activity fulfillment of the school and college educators of Gujarat. It additionally planned for recognizing the components that influence the educators at individual, gathering and authoritative levels. The example for the examination comprised of 82 employees having a place with 25 MBA Colleges and University branches of Gujarat acquired through straightforward irregular testing. Different writings were alluded so as to comprehend different components influencing the activity fulfillment. The variables distinguished were isolated into Individual and Institutional components class. The data was gathered from the Faculty individuals with the assistance of Questionnaire and Interview strategy. The outcome distinguished the Job Satisfaction Factors (JSF) that influence the fulfillment level of the Faculty Members. The individual components incorporate fulfillment from study hall educating, Training and Faculty Development Programs, Performance Appraisal, Cooperation and conduct of friends (partners). Aside from this the institutional variables are physical working condition, understudy collaboration, understudies IQ, understudy interest, enthusiasm to learn, acknowledgment for additional work/subjective work, goals and unmistakably characterized advancement approaches, compensation, cooperation in basic leadership, the board style/the board reasoning/vision/strategic/at top administration, testing and intriguing work, employer stability, association culture, support for inquire about condition in association and notoriety of association in showcase. It tends to be henceforth inferred that the association and the top administration ought to guarantee that the approaches and practices in the association deal with these components to guarantee the staff work fulfillment which could eventually influence their degree of execution and educating.

Parveen (2013) directed an exploration on ―Faculty Stress in a Saudi Government University‖ with the goal of investigating the staff recognition towards word related

worry in the school of business. Information was gathered from 160 employees of different offices utilizing Faculty Stress Index (FSI). Multivariate investigation of Variance was led to distinguish and look at singular pressure contrasts as far as sexual orientation, scholarly position, nationality, scholastic degree, office, business status and No. of years working in college. The outcome indicated that the male individuals with a mean score of 2.3750 are having an excessive amount of weight than female personnel with a mean score of 1.8657 identified with Students' Interaction Subscale. It was additionally noticed that age and conjugal status doesn't have any impact on male and female employees. When all is said in done, huge contrasts in impression of individual worry as far as statistic factors were watched

In a review of rustic and urban auxiliary instructors, Abel and Sewell (1999) found that urban teachers experienced fundamentally more worry than provincial teachers in with respect to poor working conditions and staff support. In the two kinds of schools, understudy trouble making and remaining task at hand were found to most critical indicators of worry in the two sorts of schools. As indicated by Kim-wan (1991) less experienced instructors and those with less social help have higher burnout.52 Travers and Cooper (1997) study discovered remaining task at hand and pay as essentially connected with word related worry among English educators.

In an example of auxiliary teachers in Netherlands, Brouwers et al (2006) found that absence of social help among instructors was influencing educators self-adequacy conviction and causing burnout. Then again burnout was found to anticipate degree of saw absence of social support.54 Male and May (1997) found inordinate outstanding task at hand (45%) as the most unpleasant in educators of kids with a custom curriculum needs. This was trailed by administrative work (41%) and testing conduct (21%)

An investigation of 1000 understudy instructors Morton et al, (1997) and Lewis (1999) revealed understudies conduct altogether connected with worry among educators. Lewis (1999) additionally detailed that concerned instructors were falling wiped out because of stress.50 Similarly, Axup (2008) et al found that understudies conduct was huge reason for tension among educators.

Guthrie (2006) found that female educators in Australia were having higher business related worry than their male partners.

3.Occupational Stress among police personnel

A larger part of research has shown that police pressure is basecL on the individual cop's view of a specific occasion. Truth be told, Violanti (19831) proposed that officials change their discernment as their administration time increments. Sadly, the upsetting occasions experienced by singular cops influence them behaviourally, mentally, socially, inwardly, and physically.

Research has shown that police

pressure antagonistically influences the official's social emotionally supportive networks, for example, marriage and family and other social connections. A broad writing survey by Alkus and Padesky (1983) concerning pressure and cops showed that conjugal challenges are regularly announced and that separation rates, especially during the initial hardly any long periods of police administration, show up exceptionally high. In addition, they showed that conjugal issues seem, by all accounts, to be the most critical hastening worry in cop suicides, particularly for more youthful officials.

Police pressure is likewise influenced by the official's age, conjugal status, and instruction level. Research led by Spielberger et al. (1981) showed that more youthful officials (ages 18-29) evaluated "Court Leniency," "Insufficient Salary," and "Family Demands" as more exceptionally distressing than did more seasoned officials. More seasoned officials appraised "Absence of Recognition" as exceptionally unpleasant. Mayes, Barton, and Ganster (1991) looked into the directing impacts of age on stressor-strain connections in an example of 523 cops, firemen, circuit testers, and directors, ages 18-63 years. They found that age directed the connection between different occupation stressors and physiological (i.e., adrenaline and wellbeing side effects) and mental strains (i.e., misery and life fulfillment).

Spielberger et al. (1981) likewise found that officials with the most elevated level of training (post-graduate work) appraised "On-the-Spot Decision Making," "High Moral Standards," and "Over the top Paperwork" as significantly less distressing, and "Weakening Injury" as substantially more unpleasant than officials with either a secondary school, some school, or higher education level of instruction. Actually, Burke (1994) found that cops with more instruction revealed less psychosomatic indications and negative inclination states. As to status, Spielberger et al. (1981) found that solitary officials appraised "Physical Attack" as increasingly unpleasant and "Advancement" as considerably less distressing, while isolated or separated from officials evaluated "Absence of Recognition" as profoundly upsetting. Hitched officials evaluated "Fast Chases" as increasingly unpleasant and "Physical Attack" as less distressing.

Ethnicity and sexual orientation somewhat influence worry in policing. Wexler and Logan's (1983) examination of worry among female cops showed that negative demeanors of male officials, preparing, introduction to catastrophe and inconvenience, bunch fault, and bits of gossip were their significant wellsprings of stress and that the activities of male cops expanded the anxiety for ladies officials

Janik and Kravitz (1994) looked into the records of 134 cops who had as of late experienced a qualification for-obligation assessment dependent on questions with respect to their capacity to suitably release their obligations under distressing conditions. They found that 55% of the officials admitted to past suicide endeavors. Their examination further

demonstrated that officials revealing conjugal issues were 4.8 occasions bound to have endeavored suicide and 6.7 occasions more probable in the event that they had been suspended.

Anderson (1995) contemplated pressure and its connects among 216 cops. He found that help from the official's companion, division, and social condition was unequivocally connected with physical wellbeing, incessant nervousness, mental alteration, and the impression of seriousness in word related stressors. Officials who were happy with the help they got were bound to report better physical wellbeing, less post-horrendous pressure issue symptomatology, lower levels of nervousness and enthusiastic depletion, and less worry due to hands on stressors than did officials who were not happy with their emotionally supportive networks.

Myendeki (2011) demonstrated that when the word related stressors, absence of assets happen cops actualize shirking adapting (COPE) as a system, which prompts the experience of Exhaustion. Results additionally show that cops utilize dynamic adapting, intellectual adapting and going to religion as methods for directing the pressure burnout relationship. Results additionally show that the adapting procedure shirking adapting, utilized by male officials lead to criticism. At the point when female cops experience work requests and an absence of assets they utilize looking for enthusiastic help as an adapting system.

Glass et al. (1993) suggested that the issue of apparent employment control assumed a critical job on the effect of enthusiastic fatigue on sorrow, with depleted medical attendants seeing themselves as less engaged. Psychosocial stress results in biophysical reactions like raised pulse, expanded circulatory strain, expanded muscle pressure, expanded corrosive discharge (Anderson et al., 2002) and mental concerns like burnout and weakness (Harpold and Feenster, 2002). Archibauld et al. (1999) found huge relationships between's degrees of passionate depletion, individual achievement, and indications of stress-related sickness just as its harming consequences for the physical and enthusiastic working. Educator burnout additionally influences instructing (Wisniewski and Gargiulo, 1997), responsibility to showing calling Farber (1984) and prompts negative elucidation of understudy conduct (Whiteman et al., 1996)

4.Occupational Stress among and banking employees

Enekwe, C. I., Agu, C. I., and Nnagbogu, E. K. (2014) planned for distinguishing the components causing word related worry among the bank workers and stress the executives systems utilized by male and female representatives of Nigeria banking industry. ANOVA was utilized as an exploration procedure. The specialists from the t-test investigation found that male and female bank representatives experience comparative sort of stress and stress the executives isn't sexual orientation touchy so the pressure the board strategies among male and female workers don't vary fundamentally. Analyst recommended different methods like preparing, all out computerization and others to empower bank representatives' adapt to

the degree of weight on the normal premise and not simply to offer during the difficult circumstances. They further proposed conduct procedures, unwinding systems and subjective strategies to oversee pressure.

The investigation entitled Occupational worry in banking division' by Dhankar, S. (2015) was attempted to decide the degree of stress experienced by the individuals and furthermore to examine the effect of different segments of worry among the representatives of 20 banks of Kurukshetra, Panipat, Sonipat and Karnal district. The investigation was directed among 200 workers of both open and private division banks. The study was finished with the assistance of word related pressure estimation scale comprising of 46 things. The consequence of the examination demonstrates that the private area workers feel worry because of the Role over-burden though the open division representatives feel more worry because of Unreasonable gathering and political weight. No distinction was found between the various constituents of word related worry in private and open banks. The general score of word related pressure found in private banks is 49.71% and 50.28% out in the open banks demonstrating that there is no distinction in the degree of stress experienced by the workers of the two parts.

Samartha, V., and Begum, M. (2014) in their investigation entitled ―A similar examination of word related worry among the workers out in the open and private part banks in Dakshina kannad district‖ planned for finding the effect of word related weight on the representatives of private and open area banks. A review was directed among 537 workers and different estimates like Chi-square test, relapse examination and factor investigation were utilized to gauge the outcomes. The outcome demonstrated absence of productive labor and execution pressure as the most upsetting components pursued by work conditions, requests of the family, undue desires from work, unexpected possibilities and occupation inflexibility among the open segment bank representatives while in private segment banks, nonappearance of worker contribution, physical condition and severe association exercises, versatility to change are among the elements affecting the feeling of anxiety of the representatives. It was likewise conjectured that representatives of both open division and private area banks experience the comparative degree of stress.

Pradhan, R., and Tomar, P. (2013) in their examination entitled ―Evaluating worry in the Indian Banking scenario‖ researched the degrees of stress experienced by 60 representatives of 3 diverse private division and open area banks. The examination was planned for understanding the variables that are causing unpleasant circumstances among the workers. A correlation was likewise done to distinguish which of the two parts offer better pressure the executives techniques. The outcome after use of Chi-square testing showed that the pressure is overseen successfully in private area banks (ICICI) contrasted with other open division banks like SBI and BOB. The significant sources adding to the worry

among open area banks were the absence of the executives support, absence of meeting and correspondence, an unsupportive director, dread towards the board, working condition, and others though central point in private part incorporates an excessive amount of weight, ridiculous cutoff times, associations with colleagues, social foul play, aggressive institutional culture and others. The specialists proposed different procedures to deal with worry after the examination.

Devi, An., and Sharma, J. (2013) explored the job worry among the forefront bank representatives in Jammu and Kashmir. The examination was led among 501 representatives chose through irregular testing strategy. A size of 22 things was set up for the survey and connection strategy was utilized to check the relationship of the factors. So as to check the sufficiency of information for Factor Analysis, the Kaiser Meyere Olkin (KMO) measure was applied and the resultant score of >0.60 demonstrated that information is satisfactory for factor examination. The outcome uncovered that the representatives can be classified under three sections of ―overloaded employees‖, ―unclear workers and ―underutilized representatives, in view of their experience of job stressors. The consequences of factor investigation demonstrated job vagary, job abundance, job obtrusiveness, job difference, job enlargement, self-lessening, job stronghold and asset lack as the main considerations adding to the degrees of worry among the representatives individually.

Shukla, H., and Garg, R. (2013) directed research with the point of distinguishing the reasons of worry among the bank workers and their endeavors to adapt to the pressure. The Data was gathered through self-organized poll from 50 representatives of different nationalized bank arranged in Indore with the assistance of Percentage Analysis technique. It was gotten from the outcome that lion's share of the representatives stays in worry because of different reasons including absence of value, work over-load, nonachievement of the objectives being most compelling ones. Representatives attempt systems like Yoga to ease pressure. There were not many workers who found the procedures utilized by bank to oversee pressure viably.

Ahmed, An., and Ramzan, M. (2013) directed an exploration so as to recognize the connection between work pressure and occupation execution on representatives of banking segment in Pakistan. A nearby finished poll was circulated among the 144 senior alumni workers falling under the classes of FTE (Fixed Tenure Employees) bank agreement and outsider agreement representatives. The factual instruments like relapse and connection was utilized to legitimize the targets. The Croan-bac Alpha was utilized to test the unwavering quality of the needy and autonomous factors which scored 0.694 and 0.637. The outcome indicated the negative connection between work pressure and employment execution. With the assistance of writing, the scientists recommended to expand the executives bolster and give hierarchical help to

diminish the degree of stress.

Adikaram, D. S. R., and Jayatilake, L. V. (2016) broke down the effect of work life balance on representative employment fulfillment in private division business banks of Sri Lanka. Information was gathered from 150 representatives of various business banks and was investigated with the assistance of connection and relapse. In the wake of applying the tests, no noteworthy relationship was found between working hours and working conditions and worker work fulfillment while a critical connection between work pressure, change of occupation and work-life balance projects and representative employment fulfillment.

Sarwar, An., and Aftab, H. (2011) in the title ―Work Stress and Family Imbalance in Service Sector of Pakistan‖ underlined the circumstances and end results of work pressure and Family irregularity issue. Specialists examined the reasons of worry among 500 center level chiefs working in banks alongside its effect on people and their relatives. The poll was framed and appropriated by multi organize irregular testing. Different tests like T-Test, Correlation, Man-Whitney U test, Kruskal Wallis test and Regression examination were applied so as to reach to the resolution. Individual and family effect of pressure was practically same in every one of the classes of age and no. of employments exchanged. Through connection investigation it was discovered that there is a solid positive relationship between's work pressure and work pressure family sway. Relapse examination indicated that 64.8% change in pressure sway on individual and irregularity in the family was a result of ―Work Stress.

5. Occupational Stress among nurses

The nursing calling is related with a few activity related requests that assume a job in making unpleasant workplaces. Studies have indicated that psychosocial stressors among attendants produce significant employment stress, which can prompt wellbeing issue and diminish the nature of nursing care (Kawano 2008; McVicar 2003).

Healy, McKay (1999) to distinguish what the medical caretakers saw as the significant reasons for worry in the work environment. Results indicated that the medical caretakers appraised their remaining burden as profoundly upsetting as far as both recurrence of its event and its apparent impact upon themselves. True to form, more elevated levels of revealed nursing pressure were related with lower levels of employment satisfaction.Stress tolerant attendant chiefs with high toughness levels detailed 35% less wiped out hours than their low solidness partners (Judkins, Masse and Huff, 2006). Stress tolerant medical attendant supervisors have exhibited less incessant utilization of evasion and cautious adapting systems and normally announced the impression of significant levels of family support (Judkins, 2001). The significance of social help in the working environment is additionally obvious in the writing and has been found to identify with expanded strengthening, expanded inspiration, and diminished employment strain (Shirey, 2004). To improve the individual and expert results of the job, nurture supervisors have explicitly recognized the

requirement for more help from senior organization in managing job changes and difficulties (Thorpe and Loo, 2003), more power and regard steady with expanding medical caretaker chief duties (Suominen et al., 2005)

6.CONCLUSION :

Word related Stress is an ongoing idea in root, yet a major test and a disturbing issue for representatives in every one of the areas. It is asserted that pressure is inescapable and if not controlled can influence the wellbeing and prosperity of the educators. By making mindfulness, taking restorative measures and vital pressure preventive exercises, the side effects and perils of pressure can be limited. Representatives who were skilled at utilizing and dealing with their feelings in the working environment were less inclined to report experiencing sick wellbeing (mental and physical) and were bound to report significant levels of employment fulfillment and hierarchical responsibility. These synergistic elements assume a significant job in encouraging the vital commitments nurture chiefs make toward building the sound workplaces that are vital for holding medical attendants in the workforce and for delivering positive basic leadership and wellbeing results for the two people and foundations. The connection between faculty assets and occupation fulfillment is more grounded among medical attendants that have an advancement centered objective. Medical caretakers with a counteractive action centered objective don't benefit from work force assets as much as attendants that have advancement centered objectives. The effect of choice expert on physical grievances is likewise more grounded among medical attendants with an avoidance center

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ABOUT MRGI

Malla Reddy group of Institutions is one of the biggest conglomerates of hi-tech professional educational institutions in the state of Telangana, established in 2001 sprawling over 200 acres of land. The group is dedicated to impart quality professional education like pharmacy, Engineering & Technology, MCA, MBA courses. Our sole objective is to turn out high caliber professionals from those students who join us.

ABOUT MRCE

Malla Reddy group of Engineering (Formerly CM Engineering College) has been established under the aegis of the Malla Reddy Group of Institutions in the year 2005, a majestic empire, founded by chairman Sri Ch.Malla Reddy Garu. He has been in the field of education for the last 23 years with the intention of spearheading quality education among children from the school level itself. Malla Reddy College of Engineering has been laid upon a very strong foundation and has ever since been excelling in every aspect. The bricks of this able institute are certainly the adept management, the experienced faculty, the selfless non-teaching staff and of course the students.

ABOUT ICTIMES

ICTIMES started long back with its banner to promote the vision of future technologies that change the trends of life on this planet earth. Under this banner, the Department of Humanities Sciences and Management at MRCE organizes the ICAHSM – International Conference on Advances in Humanities Sciences and Management to provide a scholarly platform to ignite the spirit of Research and bring out the latent potential in teaching fraternity and student community. ICAHSM accommodates major areas like, English Language, Literature, Phonetics, Mathematics, Physics, Chemistry and Management Sciences.

ABOUT ICAHSM

International Conference on Advances in Humanities Sciences and Management (ICAHSM-2019) will bring together innovative academicians, researchers and industrial experts in the field of Humanities Sciences and Management to a common forum. The idea of the conference is, for the scientists, scholars, engineers and students from the Universities across the world and the industry as well, to present ongoing research activities, and hence of foster research relations between the Universities and the industry with the rapid development of trends and studies in the fields concerned. ICAHSM-2019 will provide a heartwarming platform to researchers, scholars, faculty and students to exchange their novel ideas face to face together.

Estd :2005

MALLA REDDY COLLEGE OF ENGINEERING

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ISO 9001:2015 Certified Institution, Recognition of College under Section 2(f) & 12 (B) of the UGC Act,1956.

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