

Volume III Issue I
January 2016

BHARATA MATA JOURNAL of Multidisciplinary Studies

Peer Reviewed National
Research Journal



Bharata Mata College

Thrikkakara, Kochi-21
Kerala, India

EDITORIAL BOARD

Rev. Dr. Varghese Kalapparampath
Director, Bharata Mata College

Chairman

Prof. Jose J Puthussery
Principal, Bharata Mata College

Chief Editor

Associate Editors

Dr.Laly Mathew

Dr.Shiny Palatty

Dr.Paul Issac

Dr.Priyalakshmi G

Dr.Mary Joseph

Dr.John T Abraham

Editorial Advisory Board

Dr.Babu Joseph

Former Vice Chancellor, CUSAT, Kochi

Dr.P.M. Chacko

Former HOD, Department of English, U C College, Aluva

Dr.Joseph Injody

Principal, Rajagiri College of Social Sciences, Kalamassery

Dr. Sivan Nair

Indian Institute of Technology, Guwahati

Dr.Litty Allen Varghese

National Institute of Technology, Calicut

Dr.Anoop Anand

DRDO, Ministry of Defence, Govt.of India, Pune

Dr.Honey John

Indian Institute of Space Science & Technology, Thiruvananthapuram

Dr.N.R.Menon

Emeritus professor, School of Marine Science CUSAT

Dr.Mathew J Manimala

Professor and Chairperson OBHRM, IIM Bangalore

Printed and published by Prof. Jose J Puthussery, Principal Bharata Mata College. Thrikkakara

ISSN 2348 - 3571

Contents

Science

- **Potential of *Kurthia gibsonii* Mb 126 as a biocontrol agent against *Fusarium oxysporum* wilt disease of tomato plants** 01
Neethu Sahadevan, Jyothis Mathew, E.K Radhakrishnan
- **Role of Cloud Computing Resources in Teaching and Learning Process.....** 16
Murugan R, Jaseena K.U, John T Abraham
- **Synthesis, Characterization and DC Conductivity Studies of Polypyrrole Nano Zinc Oxide Composites**39
Divya Jose, Rani Joseph

Humanities

- **Nava Rashtra Nirmithiyile Poura Samasyakal**48
Aneesh Paul
- **Fans in their Fictive Worlds: *Sherlock* and the Homoerotic Fan Fiction** 53
Viju Kurian
- **The Need of a New Theory of Visual Rhetoric in Sexist Advertisements**62
Sabitha Zacharias

Commerce

- **A Study on Awareness Level of Salaried Class on Tax Laws and Tax Planning Measures**72
Geetha.C.A
- **Flipkart – Myntra Merger - An Analysis.....**91
Ubais P.I, Mathew Abraham, Telsa Tom
- **Role of MSME in Women Entrepreneurial Development.....** 100
Ajay Joseph, Tintu Mariam Philip, Anjaly Balakrishnan

Mangement

- **The Impact of Performance Management System on Employee Involvement: An empirical attestation among Scientists in R&D organizations.....** 111
Tessla Arakal, Sebastian Rupert Mampilly
- **The Role of Online Social Capital in Human Resource Management: A Conceptual Model** 128
Sangeetha K.L, D. Mavoothu

**POTENTIAL OF *KURTHIA GIBSONII* MB 126 AS A
BIOCONTROL AGENT AGAINST *FUSARIUM OXYSPORUM*
WILT DISEASE OF TOMATO PLANTS**

Neethu Sahadevan¹, Jyothis Mathew¹, E.K Radhakrishnan¹,
School of Biosciences, Mahatma Gandhi University, Kottayam, 686560

Abstract

Kurthia gibsonii Mb 126; a chitinolytic gram positive bacteria originally isolated from soil samples collected from the premises of prawn peeling units was tested for its antagonistic property against a variety of phytopathogenic fungi like *Fusarium oxysporum*, *Pythium* sp., *Corynespora cassicola*, *colletotrichum gloeosporioides*, *Aspergillus niger*, *R.solani* and *Rhizopus* sp by dual culture method. It showed in vitro antagonism against *Fusarium oxysporum*, *Pythium* sp., *Colletotrichum gloeosporioides* and *Corynespora cassicola*. The selected strain was further studied for the mechanisms behind its antagonism. The study revealed that *Kurthia gibsonii* Mb 126 could produce chitinase, protease and cellulase enzymes. The strain was further tested for its plant growth promoting traits like phosphate solubilisation, production of Indole Acetic acid and ACC deaminase and NH₃. Its ability to suppress wilt disease of tomato and to promote plant growth were confirmed by filter paper method. The results suggest that this bacterium can be used as a biocontrol agent against *Fusarium oxysporum* causing wilt disease of tomato plants. The plantlets bacterized with this strain showed increased plant root and shoot length compared to the control. This is the first report of *Kurthia gibsonii* Mb 126 against *Fusarium oxysporum* causing wilt disease of tomato plants. Since the strain exhibit some beneficial growth traits also, it can be recommended as a potential biocontrol agent after conducting some more detailed field trials.

Key words: *biocontrol, plant growth, Indole 3 acetic acid, chitinase, pot culture, ACC deaminase, dual culture*



1. Introduction

Plant diseases should be controlled to maintain the quality and sufficient availability of food, feed and fiber around the world. Different strategies have been used to control plant diseases. Farmers often heavily depend on chemical pesticides because of the belief that chemical pesticides are better trust worthy, however the environmental pollution caused by excessive use and misuse of chemical pesticides has considerably changed people's attitudes towards their use in agriculture. Nowadays there are strict regulations on chemical pesticide use and constant pressure is there to remove the most hazardous agrochemicals from the market. Moreover the health consciousness of the people along with the development of resistant pathogen due to the over use of chemicals have restricted the use of chemical pesticide in agriculture. Under these circumstances exploration of living organism with multiple properties advantageous to plants seems to be the most desirable alternative to chemical pesticides¹. This has led to the need for the development of such biocontrol agents.

The present study envisaged the antifungal activity of *Kurthia gibsonii* Mb 126 a bacterium originally isolated from the premises of a prawn peeling center, against *Fusarium oxysporum*, *Pithium* sp, *Colletotrichum gloeosporioides*, *Corynespora cassicola*, *Rhizopus* species, *Aspergillus niger* and *Rhizoctonia solani*. The mechanism behind its antagonistic property and plant growth promotion traits was studied. Further, the effect of bacterisation of tomato seeds on seedling vigour and the potential of this strain against *Fusarium oxysporum* wilt of tomato plant were confirmed by filter paper method.

2 Materials and Methods

2.1 Bacterial strain and fungal strains

The bacterial strain *Kurthia gibsonii* Mb126 originally isolated from the premises of a prawn peeling unit in Kochi² and the phytopathogenic fungal strains like *Fusarium oxysporum*, *Pithium* species, *Aspergillus niger*, *Rhizoctonia zolani* and *Rhizopus* species were obtained from the culture collection of School of Biosciences, M.G. University. Phytopathogenic fungi viz. *Colletotrichum gloeosporioides* and *Corynespora cassicola* were produced from Rubber research institute, Kottayam, Kerala, India.

2.2 Detection of antifungal properties of *K. gibsonii* Mb 126 against phytopathogenic fungi

2.2.1 Dual culture technique

Kurthia gibsonii strain was evaluated against each phytopathogenic fungi by dual culture technique as described by Morton and Strouble³. To analyze, bacteria and test fungi were placed on the opposite halves of a PDA plate at equal distance from the periphery, control plate had only fungal growth. The treatments and the controls were replicated thrice. Inoculated plates were incubated at $27 \pm 3^{\circ}$ C for 7 days. Radial growth of colony of pathogen was measured at the end of second, fourth and sixth days of incubation period. Percent inhibition was calculated by the following equation suggested by Fokkema and Shearer⁴.

Percent inhibition = $(R_1 - R_2 / R_1) \times 100$ (R_1 - radius away from the antagonist, R_2 - radius in direction of the antagonist)

2.3 Elucidation of functional traits of antagonistic *Kurthia gibsonii* Mb126

2.3.1 Protease enzyme production

Determination of protease enzyme production was carried out by the method of Chaiarn⁵. The bacteria were spotted on plates of SMA (skimmed



milk agar medium) (pH 6) containing (g/l) skim milk 15, yeast extract 0.5 and agar 9.13 and incubated at 27 ± 3 °C for 48 hours. The plates were examined for zone of clearance around the colonies.

2.3.2 Cellulase enzyme production

Production of cellulase enzyme was determined in nutrient agar supplemented with 10 g/l carboxy methyl cellulose (CMC). *Kurthia gibsonii* Mb 126 was inoculated on to this medium and incubated at 27 ± 3 °C for 48 hours. After incubation the plates were stained with 2% congo red solution and then washed with 1N NaCl and observed for zone of clearance around the colonies⁶.

2.3.3 Lipase production

For determination of lipase enzyme the following medium was used⁷ peptone 10 g, calcium chloride 0.1 g, sodium chloride 5 g, agar 15 g and 10 ml sterile tween 20 in 1 litre distilled water. Bacteria was streaked on this medium and incubated at 27 ± 3 °C for 48 h. Deposition around the colonies indicated lipase production.

2.3.4 Hydrogen cyanide (HCN) production

100 µl of bacterial suspension was inoculated on nutrient agar medium which contained 4.4 g/l glycine. Whatman No 1 filter paper was soaked in a reagent solution (sodium carbonate 2% and picric acid 0.5%) and placed in the upper lid of petridishes. The plates were sealed with parafilm and incubated in invert position at 27 ± 3 °C for 48 hours. One uninoculated plate served as control. If HCN was produced, yellow filter papers will change to cream, light brown, dark brown and eventually turned into reddish-brown⁸.

2.3.5 Chitinase production

Overnight grown *Kurthia gibsonii* Mb 126 was inoculated on to chitin agar medium (0.8 % colloidal chitin, 1.5 gm agar) and incubated at $27 \pm 3^{\circ}\text{C}$. After incubation plates were stained with 2% congo red solution followed by washing with 1N NaCl and observed for zone of clearance around the colonies⁹.

2.4 The invitro characterization of other beneficial traits of *Kurthia gibsonii* Mb 126

2.4.1 Phosphate solubilization test

Pikovskaya medium (PVK), containing glucose -10 g; $\text{Ca}_3(\text{PO}_4)_2$ - 5 g; $(\text{NH}_4)_2\text{SO}_4$ - 0.5 g; NaCl - 0.2 g; $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$ - 0.1 g; KCl - 0.2 g; yeast extract - 0.5g; $\text{MnSO}_4 \cdot \text{H}_2\text{O}$ - 0.002 g; and $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ - 0.002 g/l was used for the screening of phosphate solubilizing capacity. *Kurthia gibsonii* Mb 126 was inoculated and incubated at $27 \pm 3^{\circ}\text{C}$ for 48 hrs and observed for yellow color change.

2.4.2 IAA (Indole -3- acetic acid) production

The test strain of *Kurthia gibsonii* Mb 126 was tested for IAA production. Production of auxin was assayed by the method described by Patten and Glick¹⁰. Bacterium was cultured in nutrient broth medium and incubated at 37°C for 48 h in a shaker incubator. Then 50 μl of bacterial suspension was transferred to nutrient broth containing 50 μg /ml L-tryptophan. After 10 days, the suspension was centrifuged at 10000 rpm for 10 min. Consequently, 1 ml of supernatant was mixed with 4 ml of Salkowski reagent (2 ml $0.5 \text{ mol L}^{-1} \text{ FeCl}_3$ + 98 ml 35% HClO_4). After 20 minutes, the sample was observed for red color. The absorbance of the mixture was measured at 535 nm with a spectrophotometer and it was quantified with standard curve.



2.4.3 1-amino cyclopropane -1- carboxylic acid (ACC) deaminase production

Dworkin Foster medium¹¹ supplemented with ammonium sulfate for ACC deaminase assay was used in this test. This medium contained 20g peptone, 10 ml glycerol, 1.5g K_2HPO_4 , 1.5 g $K_2HPO_4 \cdot 7H_2O$, 15g agar/l. ACC deaminase activity of the isolates was detected based on their ability to grow in Dworkin-Foster's salt minimal medium containing ammonium sulfate or ACC as a source of nitrogen¹².

2.4.4 NH_3 Production

Production of ammonia was tested in peptone water. Overnight grown culture of *Kurthia gibsonii* Mb 126 was inoculated in 10 ml peptone water and incubated for 48-72 hours at $27 \pm 3^\circ C$. 0.5 ml of Nessler's reagent was added in each tube. Brown to yellow colour formation was considered as positive test for ammonia production¹³.

2.5 Effect of *Kurthia gibsonii* Mb 126 seed bacterization under laboratory conditions

2.5.1 Preparation of spore suspension

Spore suspension of *Fusarium oxysporum* was prepared. 8 agar blocks of actively growing *Fusarium oxysporum* was inoculated in to an Erlenmeyer flask containing 20 ml of potato dextrose broth. The flask was incubated at $27 \pm 3^\circ C$ for 3 days. The flask was then chilled at $4^\circ C$ for 30 min to induce the release of spores and then incubated at $25^\circ C$ for 30 minutes. Then the culture was filtered through cheese cloth to remove the agar blocks and attached mycelia. The resulting spore suspension was quantified using a hemocytometer¹⁴.

2.5.2 Effect of bacterization of tomato seedlings by filter paper method

Filter paper method was carried out according to the standard procedures of International Seed Testing Association - 2005 using three

replicates of 10 seeds for each treatment. The surface sterilized seeds were exposed to 4 different conditions. 2 controls and 2 treated groups. In control 1, seeds were soaked in distilled water and in control 2, seeds were treated with *Fusarium oxysporum* suspension containing approximately 4×10^4 spores. The surface sterilized seeds put in bacterial suspension (10^8 CFU/ml) were taken as group I and seeds were put in spore suspension of *Fusarium oxysporum* for 12 hours and then transferred to the suspension of *Kurthia gibsonii* Mb 126 was taken as group II. The seeds were then placed on a moistened No.1 Whatman filter paper which was carefully layered in petri plates. Ten seeds were placed per plate. Seeds were then covered with another layer of moistened No.1 Whatman filter paper. The plates were then wrapped with a sheet of butter paper to reduce surface evaporation and placed at $27 \pm 3^\circ\text{C}$. Readings of all the 120 seeds were taken after 10 days. For assessing the growth effect these seedlings were checked for its root length and shoot length. Mean of these parameters were analysed statistically by analysis of variance (ANOVA) and Tukey's test (≤ 0.05). Seedling vigor was analysed using the method of Abdul Baki and Anderson¹⁵.

The vigor index (VI) was calculated using the formula:

$$\text{VI} = (\text{mean root length} + \text{mean shoot length}) (\% \text{ germination})$$

2.6 Statistical analysis

Data from laboratory and greenhouse experiments were analysed statistically by OriginPro 7 SR0 (Northampton, MA, USA). One-way analysis of variance was used for comparison among four groups. Post hoc multiple comparison test was used to determine the significant difference in various groups. $P \leq 0.05$ was considered as significant.



3 Results

3.1 Evaluation of *Kurthia gibsonii* for antagonism

3.1.1 Dual culture test

Kurthia gibsonii Mb 126 was found to be an efficient inhibitor of the mycelial growth of *Fusarium oxysporum* and *Pythium* sp under dual culture method. In this study it was also found that *Colletotrichum gloeosporioides* and *Corynespora cassicola* were also inhibited by *Kurthia gibsonii* Mb 126. But mycelial growth of *Rhizoctonia zolani*, *Aspergillus niger* and *Rhizopus* sp. were slightly resistant to *K. gibsonii* Mb 126.

3.2 Elucidation of functional traits of antagonistic *Kurthia gibsonii* Mb126

3.2.1 Production of protease, cellulase, lipase, HCN and chitinase

Kurthia gibsonii Mb126 produced a zone of clearance around the colonies on skimmed milk agar and CM cellulose medium which indicated the production of protease and cellulase enzymes respectively. But it was not found to be producing extracellular lipase enzyme. After 24 hours of incubation on colloidal chitin agar medium, it produced translucent haloes around the colonies which indicated the production of chitinase enzyme. The strain did not produce HCN.

3.3 Phosphate solubilization, IAA, ACC deaminase and NH₃ production

Kurthia gibsonii Mb 126 strain produced clearing around the colonies after 48 hours of incubation on solidified PVK medium supplemented with ammonium sulfate indicating phosphate solubilizing ability of the test strain. It also produced red colour change on incubation with salkowski's reagent. Concentration of IAA was then quantified using a standard curve by spectrophotometry. For ACC deaminase production *Kurthia gibsonii* Mb 126 was inoculated on to DF salt minimal medium with 2% ammonium sulfate.

ACC deaminase production was indicated by the growth of *Kurthia gibsonii* Mb126 on this medium. It was also found that this strain produced ammonia.

3.4 Effect of bacterization of tomato seedlings by filter paper method

Kurthia gibsonii Mb 126 caused increased seedling vigor in tomato plantlets upon seed bacterization. Seedling vigor is the sum of those properties that determine the activity and performance of seed in a wide range of environment (ISTA 2005). In the filter paper method, seed bacterisation of *Kurthia gibsonii* Mb126 resulted in increased vigor of 758.7 over control I with 399.6. Very interestingly the Vigor Index of group II seedlings was 445.6 higher than the control II with 37.5.

Moreover filter paper method also showed that there was a considerable difference in root length and shoot length tested in different treated groups. When the root length of group I and control I was compared, considerable increase was seen in group I and there was five fold increase of root length seen in group II when compared with control 2. Similarly a 2 fold increase was seen in shoot length in group I seedlings when compared with control I and a 5 fold increase was seen in group II seedlings in comparison with control II.

4 Discussion

In the present investigation, *K.gibsonii* Mb 126 was evaluated for its antagonistic effect, production of IAA, ACC deaminase, mycolytic enzymes and phosphate solubilisation. Its effect on plant growth was assessed under green house conditions also. It was found that this strain could produce protease, cellulase and chitinase. Fungal cell wall degrading enzymes like chitinases, glucanases, proteases, and lipases individually and synergistically as complex are integral in the antagonistic mechanism of biocontrol agents. So antagonistic microorganisms producing fungal cell wall degrading



enzymes are usually considered as potential biocontrol agents against phytopathogenic fungi. It has already been demonstrated that fluorescent pseudomonads isolated from rhizosphere soil could produce one or more antifungal metabolites like hydrogen cyanide, pyrrolnitrin, phenazine and cell wall degrading enzymes protease, pectinase, cellulase and chitinase¹⁶. Many invitro studies support the significant involvement of crude as well as purified mycolytic enzymes such as chitinase, protease and cellulase either individually or in combinations in the inhibition of growth of various fungal pathogens. It has been reported that protease of *Serratia* plays an important role in the suppression of *S.sclerotiorum* and *B.cinerea* (Kamensky *et al.*, 2003). Chitinases are widely distributed in bacteria such as *Klebsiella*, *Pseudomonas*, *Clostridium*, *Vibrio*, *Arthrobacter*, *Serratia*, *Chromobacterium*, and *Streptomyces*.¹⁷ Reyes-Ramirez and colleagues (2005) reported the antifungal activity of *Bacillus thuringiensis* chitinase and its potential for the biocontrol of phytopathogenic fungi in soyabean seeds.

The selected strain was then tested for the production of various growth promoting traits like IAA production, phosphate solubilisation and ACC deaminase and NH₃ production. It was found that *Kurthia gibsonii* Mb 126 could produce high levels of IAA in nutrient agar supplemented with 50µg/ml L-Tryptophan. Indole acetic acid is the most common and well studied auxin. IAA affects root development, cell division, differentiation, affects pigment formation, synthesis of various metabolites, photosynthesis and resistance to various stressful conditions¹⁸.

L-Tryptophan is naturally present in root exudates for rhizosphere microflora which may enhance IAA biosynthesis in rhizosphere¹⁹. Indole-3-acetic acid (IAA) can be synthesized in bacteria through different biosynthetic pathways. Idris and colleagues²⁰ showed for the first time that

the gram-positive bacterium *Bacillus amyloliquefaciens* FZB42 produced and secreted significant amounts of IAA. They also showed that the production was increased with 50 $\mu\text{g ml}^{-1}$ L-tryptophan. Patten and Glick (2002) showed that the direct effect of IAA on root development produced by *Pseudomonas putida* through the indole pyruvic acid pathway.

Interestingly *Kurthia gibsonii* Mb 126 could also produce ACC deaminase enzyme and NH_3 . ACC deaminase producing bacteria have been known to enhance plant growth by ameliorating plant growth inhibition caused by ethylene production²¹. These bacteria hydrolyse ACC (ethylene precursor) to ammonia and α -ketobutyrate as their sources of carbon and nitrogen (Honma and Shimomura, 1978; Jacobson *et al.*, 1994; Glick *et al.*, 1998). Thereby it decreases ACC within the plant with the concomitant reduction of plant ethylene²². Thus it ultimately prevents ethylene mediated growth inhibition. Howell *et al.*,²³ reported that volatile compounds such as NH_3 produced by *Enterobacter cloacae* was involved in the suppression of *Pythium ultimum* induced damping off of cotton. Production of ammonia by *K.gibsonii* assured that it is a secondary metabolite of the bacteria and it has a role in its antagonism. Phosphate solubilisation by *Kurthia gibsonii* Mb 126 is another interesting property as non availability of phosphate can be a growth limiting factor for plants. There have been a number of reports on plant growth promotion by bacteria that have the ability to solubilize inorganic and organic P from soil after their inoculation in soil or seed bacterisation. These properties, phosphate solubilization, auxin production, NH_3 and ACC deaminase production, clearly indicated that *Kurthia gibsonii* Mb 126 is a novel strain that has growth promoting properties along with the antagonistic property. Very interestingly the present study revealed the production of other mycolytic enzymes like protease, cellulase and chitinase by *Kurthia gibsonii* Mb 126.



The results of filter paper method and green house experiment clearly envisaged the ability of *Kurthia gibsonii* Mb 126 to improve plant growth. In the filter paper assay, seed bacterisation with *K. gibsonii* Mb 126 resulted in increased vigor, with increase in the vigor index compared with the controls. Since these IAA producing bacteria also act as a sink of ACC, its application can have a promotional effect on IAA by preventing ethylene biosynthesis in the plant, especially at early stage of plant growth as reported by Jacobson *et al.*, (1994); Glick *et al.*, (1995) and Li *et al.*, (2000)²⁴.

The present study indicates that due to the direct (growth promotion) and indirect (antagonistic) effect, *Kurthia gibsonii* Mb 126 can be suggested as a suitable agent for controlling various fungal infections on plants. To conclude, the present study is the first report on the antagonistic activity of *Kurthia gibsonii* Mb 126 against important phytopathogenic fungus like *Fusarium oxysporum*, *Pithium* sp., *Colletotrichum gloeosporioides* and *Corynespora cassiicola*. Moreover it also shows multiple plant growth promoting traits and may be used as an effective biocontrol agent against other phytopathogenic fungi also. Since the indiscriminate and excessive application of chemical fertilizers has lead to health and environmental hazards, farmers are desperate to find alternative strategies that could provide better yield while protecting soil health. In this context, *Kurthia gibsonii* Mb126 can be considered as a possible alternative for chemicals for plant protection. Our future plans include exploration of biocontrol efficiency of *Kurthia gibsonii* Mb 126 against damping off of chilli by *Pithium* and leaf spot of rubber planting by *Corynespora cassiicola* and *Colletotrichum gloeosporioides*. The available data concerning the biocontrol efficacy of this novel agent are very limited; hence further work on this topic will be of great interest.

References

- [1] Pal, K. K. and McSpadden Gardener B., Biological Control of Plant Pathogens. *The Plant Health, Instructor* DOI: 10.1094/PHI-A-2006-1117-02.
- [2] Mini K Paul *et al.*, Utilisation of prawn shell powder for the production of chitinase by *Kurthia gibsonii* Mb 126 *Int J Pharm Bio Sci* 2012 July; **3(3)**: (B) 2012,163 – 172
- [3] Morton DT, Stroube NH 1955 Antagonistic and stimulatory effects of microorganism upon *Sclerotium rolfsii*. *Phytopathology* **45**: 419-420
- [4] Fokkema, N.J. The role of saprophytic fungi in antagonism against *Drechslera sorokiniana* (*Helminthosporium sativum*) on agar plates and on rye leaves with pollen. *Physiol. Plant Pathol.* **3**, (1973)195–205
- [5] Chaiharn M, Chunhaleuchanon S, Kozo A and Lumyong S, Screening of rhizobacteria for their plant growth promoting activities MITL *Sci Tech J* **8(1)** (2008) 18-23
- [6] Cattelan, A. J., Hartel, P. G. and J. J. Fuhrmann, Screening For Plant Growth-Promoting Rhizobacteria to Promote Early Soybean Growth. *Soil Science Society of America journal.*, **63**: (1999)1670-1680
- [7] Omidvari, M 2008 Biological control of *Fusarium solani*, the causal agent of damping off, by fluorescent pseudomonads and studying some of their antifungal metabolite productions on it. MS thesis (in Persian language), Tehran University, Iran, p.94
- [8] Bakker P. A.H.M., Bakker A.W., Marugg J.D., Weisbeek P.J and Schippers B, Bioassay for studying the role of siderophores in potato growth stimulation by *Pseudomonas* spp in short potato rotations. *Soil Biol & Biochem* **19**, (1987) 443-449
- [9] Mitsutomi M, Hata T, Kuwabara T, Purification and characterization of novel chitinases from *Streptomyces griseus* HUT 6037. *J Ferment Bioeng* **80** (1995) 153-158



- [10] Patten C., Glick B.R., 1996. Bacterial biosynthesis of indole-3-acetic acid *Can. J. Microbiol* **42**: 207-220
- [11] Dworkin, M. and J. Foster. Experiments with some microorganisms which utilize ethane and hydrogen. *J. Bacteriol.*, **75**: (1958) 592-601
- [12] Edi Husen, Aris Tri Wahyudi, Soybean Response to 1-Aminocyclopropane-1-Carboxylate Deaminase-Producing *Pseudomonas* under Field Soil Conditions *Am.J.Agric.Biol.Sci.* **6 (2)**: (2011) 273-278
- [13] Cappuccino, J.C., Sherman, N., Negative staining. In: Cappuccino JC, Sherman N, editors. *Microbiology: A Laboratory Manual*, 3rd edition. Redwood city, Calif, USA: Benjamin/Cummings pp. (1992) 125-179
- [14] Ming Min Yang *et al.*, 2012 Screening potential bacterial biocontrol agents towards *Phytophthora capsici* in pepper *Eur J Plant Pathol* DOI 10.1007/s10658-012-0057-7
- [15] Abdul-Baki AA, Anderson JD Vigour determination in soybean seed by multiple criteria; *Crop Sci.* **13**: (1973) 630–633.
- [16] Ayyadurai, N., Ravindra Naik P. And Sakthivel N., Functional characterization of antagonistic fluorescent *pseudomonas* associated with rhizospheric soil of rice (*Oryza sativa* L.). *J. Microbiol. Biotechnol.*, **17**: (2007) 919–927
- [17] Reyes-Ramirez A, Ibarra J 2005 Fingerprinting of *Bacillus thuringiensis* type strains and isolates by using *Bacillus cereus* group-specific repetitive extragenic palindromic sequence-based PCR analysis. *Appl Environ Microbiol* **71**(3): 1346-1355
- [18] Tsakelova EA, Klimova SY, Cherdyntseva TA, Netrusov AI 2006 Microbial producers of plant growth stimulators and their practical use: a review. *Appl Biochem Microbiol* **42**: 117-126
- [19] Glick B.R., D.M. Karaturovic and P.C. Newell, A novel procedure for rapid isolation of plant growth promoting *Pseudomonads* *Can. J. Microbiol* **41**: (1995) 533-536

- [20] Idris EES, Iglesias DJ, Talon M, Borriss R Tryptophan- dependent production of Indole-3-acetic acid (IAA) affects level of plant growth promotion by *Bacillus amyloliquefaciens* FZB42. *Mol Plant Microbe Interact* **20** (2007) 619-626
- [21] Glick B.R., D.M. Karaturovic and P.C. Newell, A novel procedure for rapid isolation of plant growth promoting Pseudomonads *Can. J. Microbiol* **41**: (1995) 533-536
- [22] Mayak, S., Tirosh, T., Glick, B.R., Effect of wild-type and mutant plant growth promoting rhizobacteria on the rooting of mung bean cuttings. *J of Plant Growth Regul* **18**, (1999) 49–53
- [23] Howell E.E, Foster P.G, Foster L.M, Construction of a dihydrofolate reductase - deficient mutant of *Escherichia coli* by gene replacement, *J.Bacteriol.* **170** (1988) 3040-3045
- [24] Glick B.R., D.M. Karaturovic and P.C. Newell, A novel procedure for rapid isolation of plant growth promoting Pseudomonads *Can. J. Microbiol* **41**: (1995) 533-536



ROLE OF CLOUD COMPUTING RESOURCES IN TEACHING AND LEARNING PROCESS

Murugan R.^{a,b}, Jaseena K.U.^c, Dr. John T Abraham^d

^aDepartment of Computer Applications, M.E.S. College, Marampally, Kochi, India.

^bResearch and Development Centre, Bharathiar University, Coimbatore, Tamilnadu, India.

^cDepartment of Computer Applications, M.E.S. College, Marampally, Kochi, India.

^dBharata Mata College, Thrikkakara, Kochi, India.

Abstract

With rapid growth and availability of Internet; educators, learners and administrators of educational institutions rely on ICT based tools. Technology reshapes the fundamentals of classroom teaching. Educators and learners are becoming more technology oriented and it is very important that the incorporation of latest technologies in teaching and learning process is essential. E-learning is also becoming very popular and powerful technology to supplement conventional teaching and learning and for distance learning. E-learning systems usually require many hardware and software resources. Cloud computing technology has the opportunity to quickly and economically access various applications and platforms and resources through Internet on-demand. This causes a reduction in system development costs and reduce infrastructure and IT costs, increase accessibility, enable collaboration, and allow organizations more flexibility in customizing their products both for their brand and for their audience. Cloud storage services meet this demand by providing transparent and reliable storage solutions. This paper present the role of various cloud applications, tools and resources in teaching and learning processes and also discuss the benefits of cloud architecture and resources in education and administration of educational institutions.

Keywords- Education, E-learning, ICT, Cloud Computing, Cloud Storage.

1 Introduction

Learning is an important component of life. No human beings are able to live properly without education. Introduction of ICT in education system, the schools, colleges, research institutes, and universities clearly changes the way education is conducted. To serve the purpose of data storage processing and reporting for teaching, learning and for administration, the use of ICT is very needful in the educational field. According to the needs of learners, the teacher educators have to improvise them to use the modern technology like cloud computing. There are lots of paradigms for getting knowledge or learn something. One of the most promising paradigms for education is e-learning. E-learning is commonly referred to the intentional use of networked information and communications technology (ICT) in teaching and learning. The capacity of ICT to support multimedia resource-based learning and teaching is also relevant to the growing interest in e-learning. Poor or insufficient technology infrastructure can cause more damage than good to teachers, students and the learning experience. While the costs of the hardware and software are falling, often there are other costs that have not been factored into the deployment of e-learning ventures. The most important of these include the costs of infrastructure support and its maintenance and the appropriate training of staff to enable them to make the most of the technology.

Cloud Computing is a new paradigm that provides an appropriate pool of computing resources with its dynamic scalability and usage of virtualized resources as a service through the Internet. The resources can be network servers, applications, platforms, infrastructure segments and services. Cloud computing deliver services autonomously based on demand and provides sufficient network access, data resource environment and effectual



flexibility. This technology is used for more efficient and cost effective computing by centralizing storage, memory, computing capacity of PC's and servers. With the tremendous advantages of cloud computing, we expect this technology to revolutionize the field of e-learning education.

One of the most interesting applications of cloud computing is educational cloud. The educational cloud computing can focus the power of thousands of computers on one problem, allowing researchers search and find models and make discoveries faster than ever. Students expect their personal mobile devices to connect to campus services for education. Faculty members are asking for efficient access and flexibility when integrating technology into their classes. It can provide a wide range of different academic resources, research applications and educational tools. Researchers want instant access to high performance computing services, without them responsibility of managing a large server and storage farm. This paper presents the benefits of using cloud computing techniques for teaching and learning and discuss various tools used to enhance the teaching learning process using cloud computing.

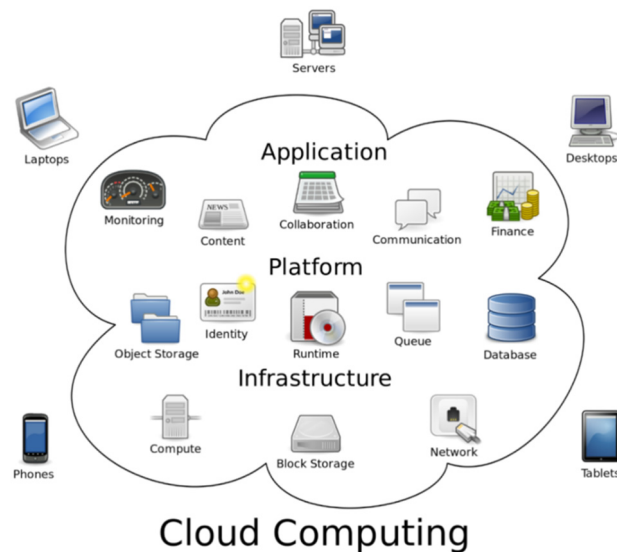
2 E-Learning

E-learning includes all forms of electronically supported learning and teaching. The information and communication systems, whether networked learning or not, serve as specific media to implement the learning process. This often involves both out-of-classroom and in-classroom educational experiences via technology, even as advances continue in regard to devices and curriculum. Abbreviations like CBT (Computer- Based Training), IBT (Internet-Based Training) or WBT (Web-Based Training) have been used as synonyms to e- learning. E-learning is the computer and network-enabled transfer of skills and knowledge. E-learning applications and processes

include web-based learning, computer-based learning, virtual education opportunities and digital collaboration. Content is delivered via the Internet, audio or video tape, satellite TV, and CD-ROM. It can be self-paced or instructor-led and includes media in the form of text, image, animation, streaming video and audio[1].

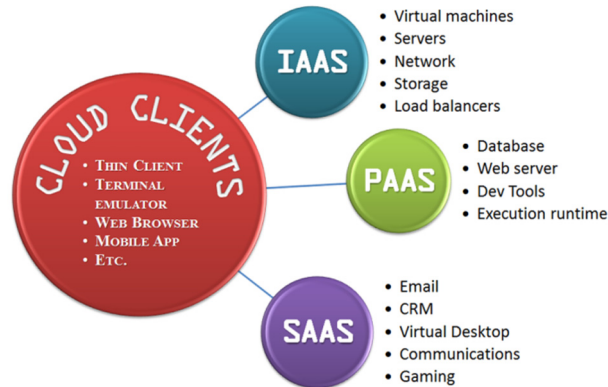
3 Cloud Computing

Cloud Computing is Internet-based computing, whereby shared resources, software and information are provided to computers and other devices on demand. The “cloud” represents the Internet. Basically, it is the delivery of computing services from a remote location. Cloud computing services are delivered through a network, usually the Internet.



3.1 Layers of Cloud Computing System

The cloud computing system has different layers such as Client, SaaS, PaaS, IaaS[3]. Servers which are specifically designed for the delivery of cloud services are also be treated as a cloud layer.



- **Client**

The client consists of hardware and software that access cloud services. The client can be a thick client or a thin client.

- **Software as a Service (SaaS)**

A complete application is offered to the customer, as a service on demand. A single instance of the service runs on the cloud and multiple end users are serviced. On the customers' side, there is no need for upfront investment in servers or software licenses, while for the provider, the costs are lowered, since only a single application needs to be hosted and maintained. Today SaaS is offered by companies such as Google, Salesforce, Microsoft, Zoho, etc.

- **Platform as a Service (PaaS)**

A layer of software or development environment is encapsulated and offered as a service, upon which other higher levels of service can be built. The customer has the freedom to build his own applications, which run on the provider's infrastructure. Google App Engine, Force.com, etc. are some of the popular PaaS examples.

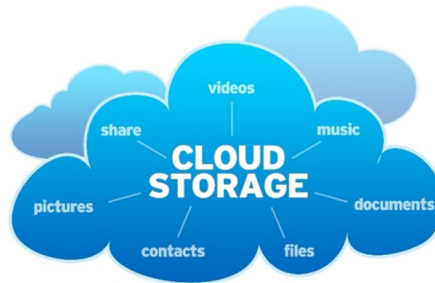
- **Infrastructure as a Service (IaaS)**

Servers, Storage systems, networking equipment, data centre space, etc. are pooled and made available for providing basic storage and

computing capabilities over the network. The customer would typically deploy his own software on the infrastructure. Some common examples are Amazon, GoGrid, 3Tera, etc.

1. Cloud Storage

Cloud data storage is a model of networked online storage where data is stored on multiple virtual servers, so that you can save your data in different servers and then get access to it from the one nearest to you, wherever you are.



4.1 Storing data on the cloud have the following advantages:

- It lets users access their data (photos, docs, files, etc.,) from virtually any internet-connected computer, tablet or smartphone.
- Data is stored offsite and becomes available via a password-protected website which adds some protection to computer theft and information hacking.
- It is safer than local storage especially in cases of local damage, system crash, fire, flood, power surge or nasty virus.
- It offers real time collaboration for people to work on their projects and files from different geographical locations.
- It also reduces congestion in someone's inbox, rather than emailing each member of you family a photo or a doc, you can for instance store all of them in one place and give them access to see them.



- Cloud storage does not require any installations, it is all done on a third party virtual server.
- It also does not need any replacing, it is all stored in one place accessible from across different devices.
- Some cloud storage systems offer backup and recovery systems.
- It has no physical presence and does not require any environmental conditions.

4.2 Some potential disadvantages of cloud data storage:

Cloud computing in general is still a fairly new technology and it is possible that some concerns and security issues might pop up on your face while using these services.

- The first concern is the level of security offered by cloud storage systems. Even if the companies offering these services maintain that the data will be safe and secure, yet some hacking incidents have been marked recently putting to question the whole security issue.
- Guarantee of accessibility: users cannot access their stored data when there is a problem in their cloud facility or if a cloud server is down. This problem, however, can be mitigated by cross using different cloud-based systems which could enable users to access their data if a problem occurred.
- Access to your data relies on internet connection which means that when there is a problem with connection, it would also be difficult to connect to the cloud system.

Cloud computing is just like any other technology; it is safer in some ways and less safe in others. Always store the same data in different services and use your common sense. Never store copies of confidential documents on the cloud and always use a strong password for your accounts.

2. Teacher Benefit from Cloud Storage

There are 12 ways teachers and students can benefit from cloud storage.

5.1 Sharing Resources

In the past, if a colleague had delivered a great lesson on tenth grade history, you might never find out about it till you had already duplicated his effort. With cloud storage, teachers within a school can create a central repository of knowledge that they can all draw on. Putting all digital resources and worksheets inside a shared folder means teachers can pick the best information and examples to create their lessons and avoid duplication of effort and wasted time. And teachers can also access all administrative documentation from a shared space too.

5.2 Better Security, Avoiding Loss

Most teachers spend a lot of time on their home computers preparing information for their students, but what if that information isn't backed up or is lost because of computer failure? Or suppose you have put it on a portable hard drive or USB drive and then that drive is lost, stolen or damaged? Having key data stored in the cloud makes this a thing of the past.

For example, you won't have to worry about data loss, because everything will be backed up with your cloud storage provider. And you don't need to worry about someone getting access to sensitive information (most of the time, anyway) as people will need a username and password to get access to the whole cloud backup service.



Cloud backup is very reliable. It provides the opportunity to backup all files on a server besides computer hard drives. Cloud backup ensures the safety of stored information. Cloud storage protects important research papers or lectures from hard disk crash or any other technical issue. And cloud technology ensures that no fraud gets access to sensitive information. Because it is password protected. For additional security, provisions can be made to place restriction on the content of individual folder and set password for them.

5.3 Huge Storage Capability

One of the main advantages of cloud storage is that, it has lots of space. Cloud provides the opportunity to store things like documents, videos, presentations which are extremely necessary for teachers. These stored documents and presentations can help the students understand the ideas and concepts in the classroom. It allows the teachers to remain organized knowing all their materials are safe at a specific location. Without moving their laptops or hard drives teachers may use their necessary files on regular basis by using cloud storage.

5.4 Freedom of Using Own Device (BYOD)

Sometimes the technical facilities of a school may not be up to the standard. As a result, many teachers have to bear the frustration of using unhandy technology. It gets even worse when he/she has a better laptop at home. Cloud technology relieves the teachers from this discomfort. By virtue of this technology teachers can use their own gadget freely in their workplace.

5.5 Ease of Grading

Teachers can give assignments and home works online via the cloud. They can post assignments and grade them easily with much comfort by

using cloud technology. Applying the cloud system, teachers can allow the students to submit their assignments online without printing anything. Cloud technology helps the teachers to grade faster and more accurately.

5.6 Collaboration with Other Teachers

Cloud storage is a great tool for educational collaboration. Need to create a new course? Then keep all the source files in a secure cloud repository where everyone can work on them. Physical location is no longer a barrier to collaboration, so you can even work with teachers in other educational institutions and in other countries, to create the best experience for your students.

5.7 Student Collaboration

Cloud storage is great for students too. For one thing, they can have constant access to cloud materials and never again have to worry about losing a single, crucial piece of paper. And working on group or class projects becomes much easier with cloud storage, as students can upload and combine resources in a single cloud storage repository. In fact, in networked institutions, they might even be able to run their presentations from those same cloud services, taking advantage of inline media playing and excellent multimedia display.

5.8 Running Applications

“It’s not in the budget.” That’s something teachers often hear when requesting the latest piece of educational software. But if educational institutions use cloud storage, then maybe the budget can go further. That’s because they will only pay for the storage space they need and because some cloud storage providers (like Jolidrive) make applications available. This cuts down on software licensing costs for teachers and educational institutions so



they can spend more money on the other resources they need instead. An educational license for Google Drive (100 GB for 23.88 \$/year), for example, would give students and teachers access to word processing, spreadsheet and presentation software as well as file, image and media storage.

5.9 Tracking Changes

One of the annoying things sometimes can be when you change a file and then decide that you don't like the new version. Since many cloud storage services keep track of different versions of files it is easy to restore the old version and have that available to everyone without needing to run around collecting outdated copies.

5.10 Reducing Paper Use

Using the cloud can help teachers interested in green issues do their bit for the environment and model responsible behaviour for their students. Using digital resources and encouraging students to access these on their own devices is one aspect of this. But it's also useful to give students access to work sheets from a central place and let them print them as needed. This cuts down on unnecessary printing and paper wastage, reducing the school's printing bill and benefiting the environment at the same time.

5.11 Helping Others

There are many developing countries without widespread access to educational resources – and therefore to education. But when information is stored in the cloud, if teachers are able to access the internet either via a fixed connection or their mobile devices, then they can use those resources to benefit their students.

5.12 Far-Reaching

Many third world countries cannot provide their students and teachers with quality education. Students are deprived from quality education due to absence of standard schools. By using cloud storage students all over the world can be benefited. Light of knowledge can be spread all over the world through the use of Cloud technology.

6. Cloud Storage Tools

The various commonly used cloud storage tools are Google Docs, Evernote, Dropbox, Team Drive, Ubuntu, Spideroak, SkyDrive, CX, Cubby, Box, Uploadingit, Amazon Cloud Drive, Pogoplug, etc.



6.1 Google Docs



- **More than letters and words**

Google Docs brings your documents to life with smart editing and styling tools to help you easily format text and paragraphs. Choose from thousands of fonts, add links, images, drawings, and tables. All for free.



- **Get to your documents anywhere, anytime**

Access, create, and edit your documents wherever you go—from your phone, tablet, or computer.

- **Do more, together**

With Google Docs, everyone can work together in the same document at the same time.

- Share with anyone

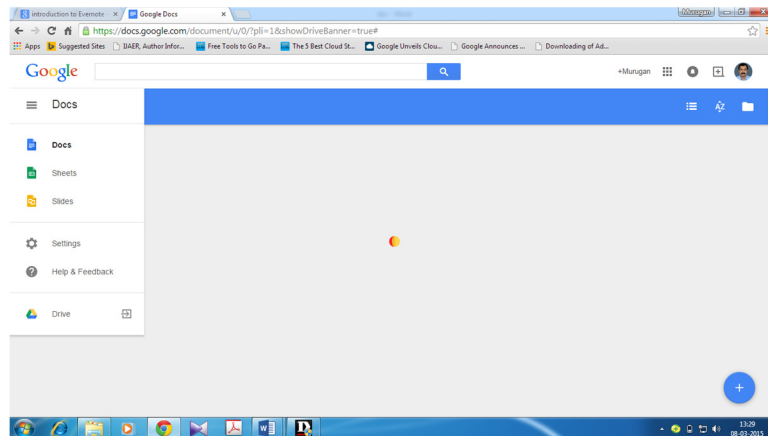
Click share and let anyone – friends, classmates, co-workers, family – view, comment on or edit your document.

- Edit in real-time

When someone is editing your document, you can see their cursor as they make changes or highlight text.

- Chat & Comment

Chat with others directly inside any document or add a comment with “+” their e-mail address and they will a notification.



- **Never hit “save” again**

All your changes are automatically saved as you type. You can even use revision history to see old versions of the same document, sorted by date and who made the change.

- **Works with Word**

Open and edit Microsoft Word files. Convert Word files to Google Docs and vice versa. Don't worry about buying software again.

- **Offline? No problem**

You can get to your documents from wherever you are, even without a signal. Simply enable offline editing to work in your browser or pin files on your mobile device.

- **Do more with add-ons**

Take your Docs experience even further with add-ons. Try Avery Label Merge to create and print labels and name tags.

6.2 Evernote

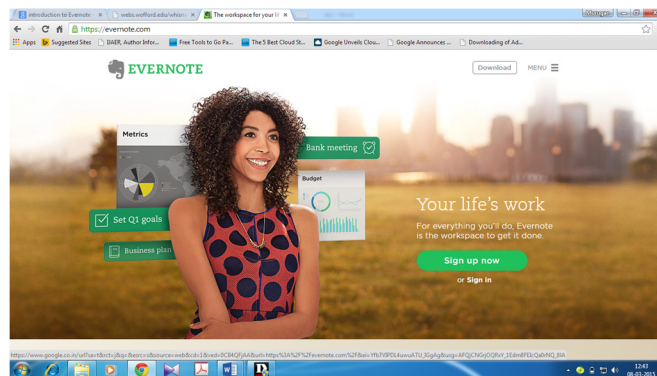
Evernote is a Cloud productivity tool and digital notebook that allows you to store various types of content, and access your content seamlessly from various devices—whether it be a smartphone, a PC, or a tablet.

Evernote is a place to store any kind of electronic information in the same place – Email messages – Web pages – PowerPoint presentations – Word, Excel, PDF, files – Pictures – Screen clips – Audio and video files.

Evernote is available on the web – <http://www.evernote.com/> – Two versions: free and Premium (\$45/year) – Several platforms • Mac OS X Leopard • Windows • iPhone / iPod Touch • Windows Mobile.



Evernote stores notes in Notebooks. Evernote uses tags (descriptive words) rather than sections or folders to classify notes. We can assign one or more tags to a note. We can enter additional tags when needed. The tags are stored with the note. One note can have more than one tag. Tags can be added and removed at any time.



Here are a few stand-out functions:

- We can sync your Evernote account across multiple devices, including your PC, Mac, tablet, and smartphone, and have complete access to all your stored data, notes, and other items from all places.
- We can create notebooks to share collections of notes with certain teams. For example, your Marketing Ideas notebook can be a joint collaboration with the marketing team while your Recipes to Try notebook might just be one you share with your spouse so you're both inspired when it's time to plan meals.
- Thanks to Evernote's Optical Character Recognition (OCR) technology, you can snap a picture that includes text, signage, or other lettering, and Evernote will recognize and store that data along

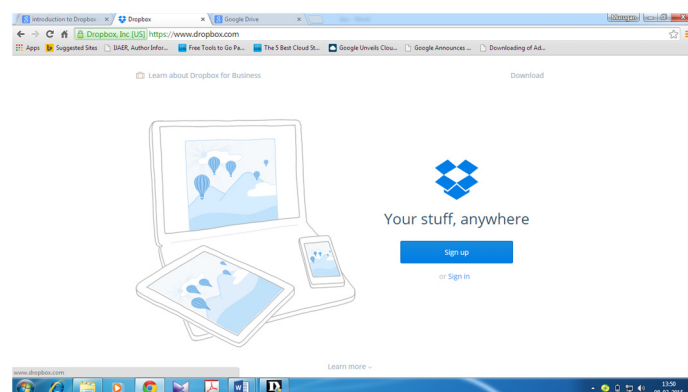
with your picture, making it easy for you to search a keyword term and find the photo you're looking for later.

- Advanced tagging features let you associate data with each note and notebook, so you can easily create a personal library of well-tagged notes that can be searched by keyword.
- Evernote's Web Clipper, a new alternative to bookmarks in your browser, lets you save your favorite links easily for later perusal.

6.3 Dropbox

Dropbox is *free* for the first 2GB of storage. If you want more than that you'll have to pay, or have people sign-up for Dropbox using a link you provide in which case they'll award you a little referral love by increasing that amount for each person bring in. You *do* have to download their software to install on your machine—this is not a browser-based program. You'll need network access, obviously, if you want files to be synced between machines.

It offers a 2GB free storage capacity and you can get up to 8 GB by inviting every new user. It works on Windows, Mac and Linux as well as on smartphones and tablets.





- Wherever you are

Put your stuff in Dropbox and get to it from your computers, phones, or tablets. Edit docs, automatically add photos, and show off videos from anywhere.

- Share with confidence

Share photos with friends. Work with your team like you're using a single computer. Everything's automatically private, so you control who sees what.

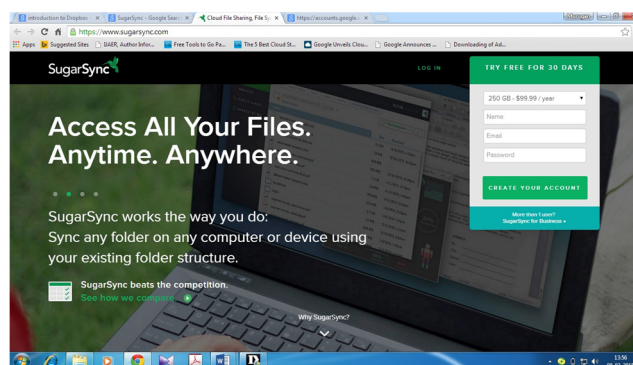
- Safe and secure

Even if your phone goes for a swim, your stuff is always safe in Dropbox and can be restored in a snap. Dropbox secures your files with 256-bit AES encryption and two-step verification.

- Dropbox for Business

Millions of people use Dropbox at work. With Dropbox for Business, get the power and security of Dropbox plus robust admin controls, dedicated support, and all the space you need. Learn about Dropbox for Business.

6.4 Sugar Sync



This tool offers up to 5 GB of free cloud storage and when you refer someone to it you will earn a 500 MB bonus. It also supports Windows and Mac and works on iOS, Blackberry, Android and Windows Mobile.

- **Powerful and Simple**

Sync just a few folders or sync all your folders. Simply right click on any folder to add it to SugarSync. The entire folder is continuously backed up in real time providing you access to your folders anytime, anywhere, from any PC, Mac, iOS, or Android device. Start editing a file on your office PC and finish it at home on your home Mac.

- **Secure File Sharing**

Whether it's to collaborate on team projects, distribute view-only files, or simply post links to documents on the web, you have complete control over how you share your files. Invite specific people to access your files and control whether they can only view them or edit them too. Don't need to restrict access? Generate a public link so that anyone with the link can view your files.

- **Remote Wipe Your Data**

Remote Wipe makes it simple to remove all synchronized files from a PC or Mac in the event of loss or theft. It also makes it easy to transfer ownership of a computer — you can rest assured that all personal data stored in the cloud has been removed from a machine after you've used Remote Wipe. And, because the data remains in the cloud, it can easily be synced to a new, replacement device. We believe we are the only company providing this level of control and security for both a PC or Mac owner.



- **Mobile Productivity**

Get stuff done on-the-go. Use SugarSync on your iOS or Android phone or tablet to access, share, and manage your files from anywhere. Edit a file and it's instantly updated so you'll see the latest version when you're back at the office or at home.

6.5 TeamDrive

This is a great secure cloud storage service that offers users up to 10 GB of free cloud storage. It also provides easy and secure collaboration and automatic encryption and synchronisation.

6.6 Ubuntu

Ubuntu provides 5GB of free cloud storage and allows users to keep their content safe, access it anywhere, and even share it with other friends and colleagues.

6.7 iDrive

This one here offers 5 GB storage and supports multiple languages. It works for Mac, Windows, and iPhone.

6.8 SpiderOak

SpiderOak is a free service that provides an easy, secure and consolidated free online backup, sync, sharing, access and storage solution for Windows, Mac OS X, and Linux.

6.9 SkyDrive

This is a service from Windows Live and can be used to store your data on the cloud for free and also to backup and sync your computer files.

6.10 Box

This is another wonderful cloud storage service that lets users store all their content online and access, manage and share it from anywhere. It offers from 5 to 50 GB of free storage.

6.11 Uploadingit

This is a great file hosting site. It allows users to upload, download, manage and share images, videos, documents and many more. The free plan offers 10GB of space and 10 Gb of daily bandwidth.

6.12 Amazon Cloud Drive

This is the official cloud data storage system of Amazon. It offers up to 5GB of free storage together with backup services but does not sync files.

7. Advantages of Cloud based e-learning

There are numerous advantages when the e-learning is implemented with the cloud computing technology [2]. They are:

7.1 Low cost

E-Learning users need not have high end configured computers to run the e-learning applications. They can run the applications from cloud through their PC, mobile phones, tablet PC having minimum configuration with internet connectivity. Since the data is created and accessed in the cloud, the user need not spend more money for large memory for data storage in local machines. Organizations also need to pay per use, so it's cheaper and need to pay only for the space they need.



7.1 Improved performance

Since the cloud based e-learning applications have most of the applications and processes in cloud, client machines do not create problems on performance when they are working.

7.2 Instant software updates

Since the cloud based application for e-learning runs with the cloud power, the software's are automatically updated in cloud source. So, always e-learners get updates instantly.

7.3 Improved document format compatibility

Since some file formats and fonts do not open properly in some PCs/mobile phones, the cloud powered e-learning applications do not have to worry about those kinds of problems. As the cloud based e-learning applications open the file from cloud.

7.4 Benefits for students

Students get more advantages through cloud based e-learning. They can take online courses, attend the online exams, get feedback about the courses from instructors, and send their projects and assignments through online to their teachers.

7.5 Benefits for teachers

Teachers also get numerous benefits over cloud based e-learning. Teachers are able to prepare online tests for students, deal and create better content resources for students through content management, assess the tests, homework, projects taken by students, send the feedback and communicate with students through online forums.

7.6 Data security

A very big concern is related to the data security because both the software and the data are located on remote servers that can crash or disappear without any additional warnings. Even if it seems not very reasonable, the cloud computing provides some major security benefits for individuals and companies that are using/developing e-learning solutions.

8. Conclusion

Cloud computing is a significant alternative for today's educational perspective. Learners, Educators and Administrative Personnel have the opportunity to get quick access of various application platforms and resources through the internet on demand. This automatically reduces the cost of organizational expenses and offers more powerful functional capabilities. In this paper we discussed various cloud based tools and storage technologies for teaching and learning process. Cloud based education will help the learners, educators, trainers, institutions to a very high extent to get the knowledge shared over various parts of the world. Even governments can take initiatives to implement this system in educational institutions in future.

References

- [1] U.J.Bora, M.Ahmed, "E-learning using Cloud Computing", in the international journal of Science and Modern Engineering(IJSMF), ISSN: 2319-6386, Volume-1, Issue-2, January 2013.
- [2] R.Jayakumar, "Cloud Computing in E-learning for different Perspectives of Teacher Education", in the International Journal of Multidisciplinary Research and Development 2014; 1(6): 77-81.
- [3] Suresh Yadav, "Role of Cloud Computing in Education", International Journal of Innovative Research in Computer and Communication Engineering (An ISO 3297: 2007 Certified Organization) Vol. 2, Issue 2, February 2014.



Web url

<https://www.google.com/drive/>

<http://googledocs.blogspot.in/>

<https://evernote.com/evernote/>

<https://www.dropbox.com/>

<https://www.sugarsync.com/>

<http://teamdrive.com/>

<http://www.ubuntu.com/cloud/storage>

<https://www.idrive.com/>

<https://spideroak.com/>

<https://onedrive.live.com/about/en-us/>

<http://www.uploadingit.com/>

<https://www.amazon.com/clouddrive/home>

SYNTHESIS, CHARACTERIZATION AND DC CONDUCTIVITY STUDIES OF NANO ZINC OXIDE FILLED POLYPYRROLE COMPOSITES

Divya Jose^{1,2}, Rani Joseph²

¹Bharata Mata College, Thrikkakara, Cochin-21

²Polymer Science and Rubber Technology, Cochin University of Science and Technology, Cochin-22

Abstract

Polypyrrole- nano zinc oxide composites were prepared by in-situ chemical oxidative polymerization method. Naphthalene sulphonic acid is used as dopant and ammonium peroxy disulphate as oxidant. Composites were characterized using SEM, UV-Visible spectroscopy and FTIR. The room temperature dc electrical conductivity of polypyrrole nano zinc oxide composites was measured using two probe method and observed to depend on the amount of nano zinc oxide.

Keywords: - Polypyrrole, nano zinc oxide, nano composite, conductivity.

Introduction

For the past few years, most of the researchers are extensively indulged in the development of nano materials and their composites because these materials and their composites have shown several applications such as electronic devices, sensors, opto electronic devices, medicines, renewable energy materials, etc. Moreover the nano composite materials composed of conducting polymers have brought out many applications such as smart windows, antistatic coatings, electromagnetic shielding materials, gas sensors, actuators, rechargeable batteries, drug delivery etc.^{1,2}



In recent years, the conducting polymers are used as substitute for metals and semiconductors as advanced materials for electronic and electrochemical devices. Among the conducting polymers, polypyrrole is especially promising for commercial applications because of its good environmental stability, facile synthesis, and higher conductivity than other conducting polymers³. It possesses deep black colour, ion-exchange capacity, hydrophobic nature, strong adsorption capacity towards molecular and macromolecular species⁴. Polypyrrole can be often used as biosensors, wires, micro actuators, anti-electrostatic coatings, electro chromic windows and displays, polymeric batteries, etc.^{3,4}

Nowadays, polymer-inorganic hybrid nano composites have been receiving extensive attention due to their innumerable applications in various fields. As mentioned in reference [4,5] the transparent metal oxides nanoparticles like zinc oxide, titanium oxide have non-toxicity, chemical sustainability and feasibility of their being doped with variety of ions⁶. Among these zinc oxide has been greatly used in the fabrication of polypyrrole hybrid materials⁷. It has been reported about several zinc oxide – polypyrrole composites and dc conductivity measurements by mechanical mixing of polypyrrole and zinc oxide powder. But a few studies are there on the nano zinc oxide in-situ polymerisation method.

In view of this, in the present work attempts have been made to study the variation of conductivity by in-situ polymerization of polypyrrole with different weight percentages of nano zinc oxide.

Experimental Procedure

Preparation of polypyrrole

0.15 mol of β - naphthalene sulphonic acid is added to 100 ml distilled water and stirred for 10 minutes. To this magnetically stirred solution, add 0.3 mol of pyrrole and stirred well for 15 minutes. To this well stirred

solution add dropwise 0.6 mol ammonium peroxydisulphate solution in 20 ml distilled water. Then solution is stirred for 24 hours. Add distilled water and methanol to stop the reaction and filtered using Whatmann No.1 filter paper, till washings are colourless. Then it is dried at 60⁰C in hot air oven.

Preparation of nano zinc oxide- polypyrrole composites

Nano zinc oxide is added to 100 ml of distilled water. It is then magnetically stirred for 30 minutes. Then add 0.15 mol of β -naphthalene sulphonic acid and stirred for 10 minutes. To this magnetically stirred solution, add 0.3 mol of pyrrole and stirred well for 15 minutes followed by the addition of 0.6 mol ammonium peroxydisulphate solution in 20 ml distilled water drop wise. Then solution is stirred for 24 hours. Distilled water and methanol is added to stop the reaction and filtered using Whatmann No.1 filter paper till washings are colourless. Then it is dried at 60⁰C in hot air oven.

Characterisation

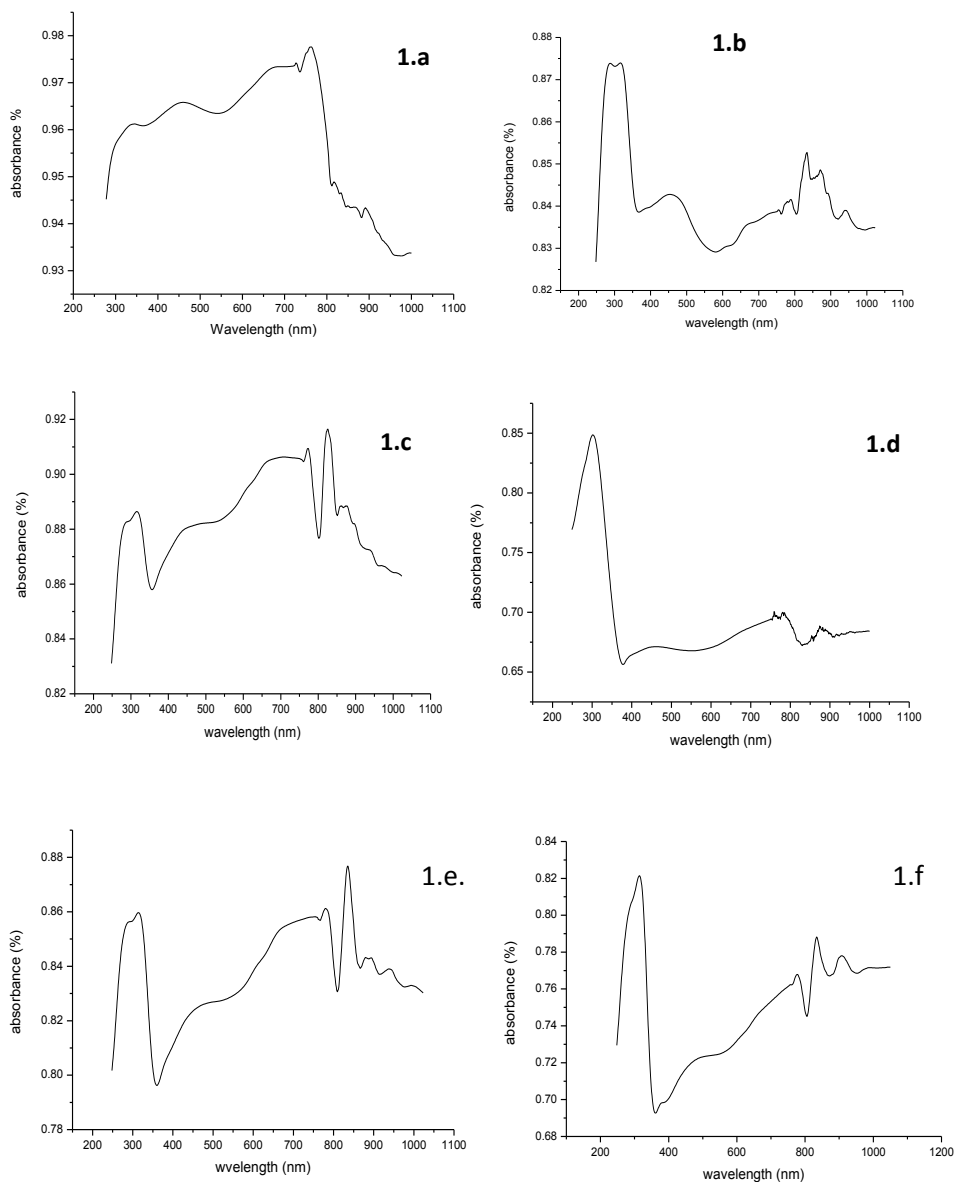
The chemical bonding was analyzed using FTIR spectroscopy by Fourier Transform Infra Red Spectrometer (Model: Thermo Nicolet, Avatar 370) using KBr pellets. UV-Visible spectra of the samples were taken using UV-Vis-NIR Spectrophotometer model: Varan, Cary 5000. Wavelength is recorded between 200-800 nm. The morphology of the samples was examined using Scanning electron microscope (SEM) JEOL make JSM 5400 Model.

The DC conductivity of samples was measured by preparing its pellets of diameter 13mm and thickness approximately 1mm. The conductivity was tested by two probe apparatus. It consists of two copper plates which serve as electrodes. One of the copper electrodes is spring loaded to give enough pressure on the sample pellet so that electrical contact is maintained. The conductivity was measured at room temperature.



Results and Discussions

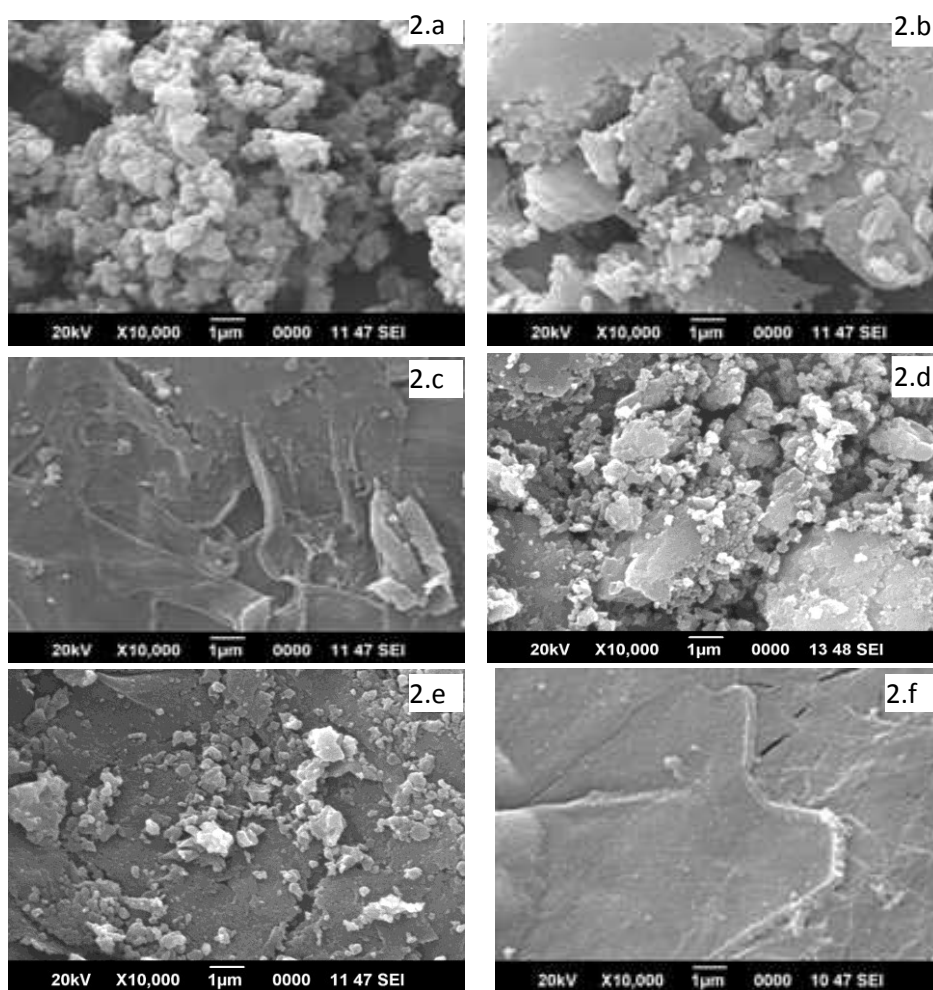
UV-Visible spectroscopy analysis data



The UV-Visible spectra of 1.a pure polypyrrole, 1.b 10% nanozinc oxide-polypyrrole composite, 1.c 20% nanozinc oxide-polypyrrole composite, 1.d 30% nanozinc oxide-polypyrrole composite, 1.e 40% nanozinc oxide-polypyrrole composite, 1.f 50% nanozinc oxide-polypyrrole composite.

From the figure 1, we get the peaks in the range between 278-320 nm, which indicates the presence of nano zinc oxide particles in the figures 1.b-1.f. Also we get the peaks in the range 760-835 nm which correspond to polypyrrole chains in the figures 1.a- 1.f.

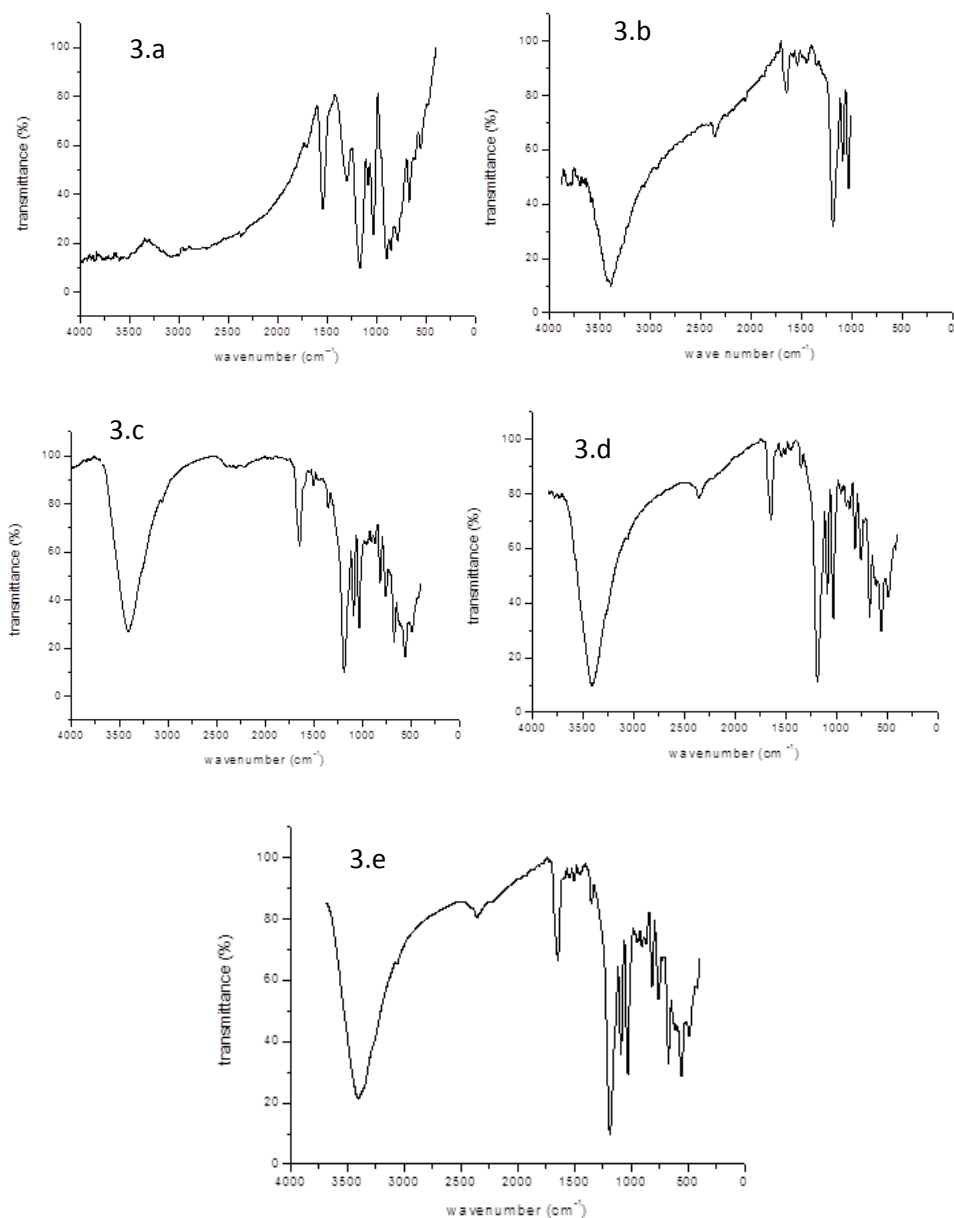
Morphological studies of pure polypyrrole and nano zinc oxide polypyrrole composites



SEM Analysis of 2.a pure polypyrrole, 2.b 10% nano zinc oxide-polypyrrole composite, 2.c 20% nano zinc oxide-polypyrrole composite, 2.d 30% nano zinc oxide-polypyrrole composite, 2.e 40% nano zinc oxide-polypyrrole composite, 2.f 50% nano zinc oxide-polypyrrole composite.



Fourier Transform Infrared Analysis



FTIR Studies of 3.a pure polypyrrole, 3.b 20% nano zinc oxide-polypyrrole composite, 3.c 30% nano zinc oxide-polypyrrole composite, 3.d 40% nanozinc oxide-polypyrrole composite, 3.e 50% nanozinc oxide-polypyrrole composite.

From the figure 3, the peaks at 3250- 3400 cm^{-1} corresponds to N-H stretching, 2210- 2260 cm^{-1} corresponds to C=N stretching, 1640-1680 cm^{-1} corresponds to C=C stretching, 1580-1650 cm^{-1} corresponds to N-H bending, 650-1000 cm^{-1} corresponds to = C-H bending of alkenes. And we got the peaks at 3300-3400 cm^{-1} , so from ftir spectra it is clear that polypyrrole is formed. The peaks between 450- 500 cm^{-1} shows the metal oxide ZnO, 1400- 1500 cm^{-1} shows C=O bonds, 1626 cm^{-1} O-H bending vibrations, peaks near 620,1642 cm^{-1} shows the Zn-O deformation and stretching.

DC Conductivity Studies

As the concentration of nano zinc oxide increases, the dc conductivity of the samples decreases. This is due to the fact that a layer of nano zinc oxide is forming above polypyrrole layer. As the doping amount of nano zinc oxide increases it will prevent the tunneling of electron from one polypyrrole chain to the other. This causes a decrease in conductivity.

Weight percentage of nano ZnO(Weight %)	Conductivity S/Cm
0	.00000825264
10	.0019697
20	.0120
30	.000942
40	.000846
50	.000061115

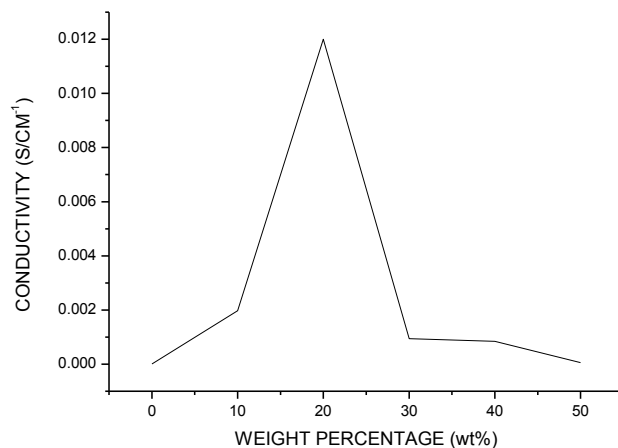


Figure 4. Variation of conductivity with different weight percentage of anozno to pyrrole monomer ratio.

Conclusions

Polypyrrole doped with β - naphthalene sulphonic acid and its nano zinc oxide composites was synthesized. All these six samples were characterized using FTIR, UV-Visible Spectroscopy, and SEM. It was seen that there are structural and morphological differences which affect their conductivity properties. The electrical conductivity was highest for 20% nano zinc oxide – polypyrrole composites. ($\times 10^{-3}\text{S/cm}$). As the percentage of zinc oxide increases, distribution of zinc oxide particles in polypyrrole is difficult. This in turn affects the conductivity of the composites.

References

- [1] Komilla Suri., S. Annapoorniand., R. P. Tandon., *Phase change induced by polypyrrole in iron-oxide polypyrrolenanocomposite*, Bulletin of Material Science,USA,2001,24(6);
- [2] Terje. A. Skotheim and John. R. Reynolds., *Recent advances I polypyrrole*, Handbook of Conducting Polymers,(processing and applications)3rd edition, CRC Press, Taylor and Francis Group, London, newyork.

- [3] M.A.Chougule., G. O. Khuspe., ShashwatiSen., V. B. Patil., *Polypyrrole-Znonanohybrids: Effect of CSA Doping on Structure, Morphology*; Applied Nano Science, 2013,3,423-429
- [4] S.Ashokan.,V. Ponnuswamy., P. Jayamurugan., *Morpholical, Structural, Functional Effect and Comparative Study of Polypyrrole with PPY/Tio₂, PPY/ ZnoComposite Films by Nebulizer Spray Coating Technique*.Journal of Applied Physics and engineering, 2015,1(1); 1-9
- [5] Tanveer Fatima., T. Sankarappaand R. Ramanna., *DC Conductivity Studies of Polypyrrole- Zinc Oxide Composites*, Research Journal of Material Sciences, 2015, 3(5);1-5.
- [6] T.K. Vishnuvardhan., V.R. Kulkarni., C. Baskva raja and S. C. Raghavendra., *Bulletin of Material Science*, 2006, 3(29); 77-83.
- [7] Vivekanand S.R.C., Kam K.C., Gundiah.G., Govindaraj. A., Cheetham A.K and Rao C.N.R, *Electrical Properties of Inorganic Nanowire-Polymer Composites*, Journal of Material Chemistry,2005, 15; 4992-4927



നവരാഷ്ട്ര നിർമ്മിതിയിലെ പൗരസമസ്തകൾ

Aneesh Paul

Asst. Professor

Department of Malayalam, Bharata Mata College, Thrikkakara

അസഹിഷ്ണുത അടരടക്കുന്ന നാളുകളിൽ, കാലത്തെ വിചാരണ നടത്തി നേർവഴിക്കു തിരിക്കാ നുള്ള ശ്രമങ്ങൾ പുനർവായനയിലൂടെ സാധിതമാക്കുന്നതാണ് ആനന്ദിന്റെ രചനകൾ. രചനാത്രത്തിന്റെ കലാരത്നമായ ചട്ടക്കൂടുകൾ ഭേദിക്കുന്ന എഴുത്ത് നിശിതമായ മാധ്യമധർമ്മ വിചാരണയെന്നതുപോലെ, നിലനിൽപ്പെന്ന സത്യത്തിനുവേണ്ടി, വിഷയപരിധികളില്ലാതെ നിർവ്വഹിക്കപ്പെടുന്നതും ബഹുവിധജ്ഞാനത്താൽ പൂരിതവുമാണ്. മനുഷ്യത്വമെന്ന മതത്തിന്റെ ധർമ്മസംസ്ഥാപനത്തിനായി നിരവധി തൂലികകൾ പല കാലങ്ങളിലായി പോരാട്ടം നടത്തിയിട്ടുണ്ട്. ജനാധിപത്യവും പൗരബോധവും തുല്യനീതിയും ജീവിക്കാനുള്ള അവകാശങ്ങളും പോയ് മറയുന്ന കാലങ്ങളിൽ അവരെല്ലാം ഉയർത്തിപ്പിടിച്ചത് മനുഷ്യന്റെ ജൈവിക അവകാശങ്ങൾക്കുവേണ്ടിയുള്ള ആഹ്വാനങ്ങളെയാണ്. വ്യക്തിയുടെ അവകാശങ്ങൾ സാർവ്വത്രികമാകുന്നിടത്താണ് ജൈവപരത ഫലം ചൂടുന്നതും ജീവിതസാരം അത്രമേൽ സുന്ദരമാകുന്നതും. പൊതുസമൂഹത്തിന്റെ ക്ഷേമത്തേയും നന്മയേയും നരകമാക്കാത്ത, വ്യക്തിയുടെ ജൈവപരമായ അഭിലാഷങ്ങൾക്കുവേണ്ടിയുള്ള സമരമാണ് ആനന്ദിന്റെ ജ്ഞാനമീമാംസയുടെ സാരം. ഈ സമരം ശരിയായ ജനാധിപത്യവും സുസ്ഥിരമായൊരു നീതിബോധവും ഉയിർക്കൊള്ളുന്നതിനു വേണ്ടിയാണ്. കഥപറച്ചിലിൽ സ്വാഭാവികമായും നീണ്ടു നിൽക്കാവുന്ന വൈകാരികാംശത്തിന്റെ അതിപ്രസരങ്ങൾ ഇവിടെയില്ല. പകരം മുടിവയ്ക്കപ്പെട്ട പൗരാവകാശലംഘനങ്ങളും, നീതിസങ്കല്പങ്ങളും ചരിത്രത്തിൽ ആവർത്തിക്കരുതാത്ത തെറ്റുകളും നിറഞ്ഞ ഈ ലോകത്തെ പൊതുസമക്ഷം വിചാരണ നടത്തുകയാണ് അദ്ദേഹം.

ഫാസിസ്റ്റ് പ്രവണതകൾ ഉയിർക്കൊള്ളുന്ന, പൊതുമണ്ഡലം വിഘടിതമായേക്കാവുന്ന കാലഘട്ടത്തിന്റെ വരവ് സംഘർഷത്തോടെ പേരേണ്ടിവരുന്ന സമകാലീന സമൂഹത്തിൽ ആനന്ദിന്റെ നോവലുകളുടെ പ്രഖ്യാപിതസാരം ഏറെ പ്രസക്തമാണ്. നീതിക്കുവേണ്ടിയുള്ള പോരാട്ടങ്ങളെ പലപ്പോഴും വിചാരവിപ്ലവമാക്കുന്ന ആനന്ദിന്റെ രചനകളിൽ പലപ്പോഴും ഉയർന്നുകേൾക്കുന്ന സ്വരങ്ങളാണ് രാഷ്ട്രവും ജനതയും വ്യക്തിയും അവകാശങ്ങളുമെല്ലാം. കൂന്ദന്റെയും ഗോവർധന്റെയും ഗണേശന്റെയും തലച്ചോറുകൾ നീറിപ്പുകയുന്നതും ഈ വിചാരാംശത്തിന്റെ പൂർത്തീകരണത്തിനു വേണ്ടിയാണ്.

പ്രകോപിതമായൊരു കാലം ചരിത്രത്തിൽ പല സമയത്തും തലപൊക്കുക സാധാരണമാണ്. അവിടെയെല്ലാം നിലകൊള്ളുന്ന അസഹിഷ്ണുത അവകാശങ്ങൾക്കുവേണ്ടിതന്നെ. ചരിത്രത്തിൽ പുകൾപെറ്റ ഫ്രഞ്ചു വിപ്ലവം തുടങ്ങിയ പല സായുധവിപ്ലവങ്ങളും ഒരു സമൂഹത്തിന്റെ നിലനിൽപ്പിനും, അവകാശങ്ങൾക്കും, ഫാസിസ്റ്റ് പ്രവണതകളുടെ കോട്ടകൾ തകർത്തതിനും വേണ്ടിയായിരുന്നു. ഒരു തകർക്കലിന്റേയോ വിപ്ലവത്തിൽ തകർന്നുടയുന്ന ബിംബങ്ങളുടെയോ യുദ്ധമൊഴികളല്ല ആനന്ദിന്റെ രചനകൾ. അത് തെരുവുകളിലേയ്ക്കും പ്രാന്തപ്രദേശങ്ങളിലേയ്ക്കും അരികുകളിലേയ്ക്കും നീക്കപ്പെടുന്ന ഒരു പൗരസമൂഹത്തിന്റെ, പ്രതിഷേധിക്കാനാഗ്രഹിക്കുന്നെങ്കിലും അതിനു കഴിയാതെ പോകുന്ന വ്യക്തിപരമായ വേദനകളുടെ, സ്വരം കൂടിയാണ്. ജനാധിപത്യവ്യവസ്ഥയുടെ മുഖാമുടിയണിഞ്ഞ്, ഉള്ളിൽ കടിച്ചുകീറുന്ന അധികാരത്തിന്റെയും, ഉന്മത്തമായ രാഷ്ട്രചിന്തകളുടെയും രീതിശാസ്ത്രവിശകലനം തന്നെയാണ് ആനന്ദിന്റെ നടത്തുന്നത്. പൗരാവകാശങ്ങൾക്കുവേണ്ടിയുള്ള പോരാട്ടങ്ങൾക്കു സാധ്യതകളില്ലാത്ത ഒരു ജനത കോടതിവളപ്പുകളിലും ചേരികളിലും തെരുവുകളിലും നാടോടികളായി അലഞ്ഞുതിരിയേണ്ടി വരുമ്പോൾ ജനാധിപത്യം എന്ന പേരിൽ അഭിമാനിക്കുന്ന സമഭാവനാസിദ്ധാന്തങ്ങളുടെ കാപട്യത്തെ ധിക്കാരിയുടെ ഉൾക്കരുത്തോടെ വിശകലനം നടത്തുകയാണ് ആനന്ദിന്റെ. “ജനാധിപത്യംതന്നെ, ജനങ്ങളെ സംബന്ധിച്ചിടത്തോളം അഞ്ചുകൊല്ലം കൂടുമ്പോൾ, ബാധയൊഴിപ്പിക്കാമെന്നും ഉന്നതി നേടിത്തരാമെന്നും വാഗ്ദാനം ചെയ്യുന്ന ചില കള്ളസന്യാസിമാരുടെ കളരിയിൽ നടക്കുന്ന അന്ധമായ അനുഷ്ഠാനമോ ആഭിചാരക്രിയയോ ആയി മാറുന്നു” വെന്നാണ് അദ്ദേഹത്തിന്റെ പക്ഷം (ആനന്ദിന്റെ, 2012: 147).

രാഷ്ട്രനിർമ്മിതിയിലെ പൗരനിഷേധങ്ങൾ

നവരാഷ്ട്ര സങ്കല്പം വേരുറപ്പിച്ചിരിക്കുന്നതും നിലനിൽക്കുന്നതും പൗരസമൂഹമെന്ന ഒരേയൊരു അടിസ്ഥാനശിലയിലാണ്. നവരാഷ്ട്രത്തിന്റെ ഓരോ നിർമ്മിതിയും വളർച്ചയും അടയാളപ്പെടുത്തുന്നത്, പൂർണ്ണപ്പെടുന്നതും നിരന്തരം നിലനിൽപ്പു സാധ്യമാകുന്നതുമായ പൗരസമൂഹത്തിന്റെ നിലപാടുകളെയാണ്. പരസ്പരപൂരകമായ ഈ നിലനിൽപ്പാണ് വെറുമൊരു ഭരണശ്രമമെന്നതിനതിതമായി ജനാധിപത്യത്തെ ഒരു ജീവിതരീതിയാക്കുന്നതിനു പിന്നിൽ. മനുഷ്യജീവിതത്തിന്റെ സർവ്വാശ്ലേഷിയായ മേഖലയേയും പൂർത്തീകരിക്കാൻ സഹായിക്കുന്ന ഒരു സങ്കല്പമായിട്ടാണ് ജനാധിപത്യം വികസിതമായതും. ജനാധിപത്യം എന്ന ഈ ആശയം, രാഷ്ട്രം എന്നതിനേക്കാൾ സമൂഹവുമായി ബന്ധപ്പെടുത്തിയാണ് ആനന്ദം ചർച്ച ചെയ്യുന്നത്. ആധിപത്യങ്ങളുടെ ആശ്വാസങ്ങളില്ലാതെ സാമൂഹവ്യവസ്ഥിതികൾ അതിജീവനം നടത്തുന്നതും ജനങ്ങൾ ആധിപത്യം നടത്തുന്ന സമൂഹവ്യവസ്ഥാസിദ്ധാന്തം നടപ്പിലാക്കുന്നതും ജനാധിപത്യമെന്ന മൂല്യത്തിൽത്തന്നെ. ഇവിടെ സമൂഹം ഫാസിസ്റ്റു പ്രവണതകൾക്കതീതമായി അവകാശങ്ങളെ പൂർത്തീകരിക്കുന്ന ഭൂമികയായി മാറുകയും ചെയ്യുന്നു. എന്നാൽ ജനാധിപത്യം വേരുറപ്പോകുന്ന സന്ദർഭങ്ങളിൽ പൗരാവകാശമെന്ന ജൈവപദം നിരന്തരം വേട്ടയാടപ്പെടുകയും ചരിത്രത്തിലുടനീളം ഹിംസാത്മകരൂപം പ്രാപിച്ച് ഉറഞ്ഞുതുളുമ്പുന്നതുമായൊരു പ്രതിസന്ധിപലതും ആനന്ദ പലപ്പോഴും തന്റെ നോവലുകളിൽ വിമർശനവിധേയമാക്കുന്നുണ്ട്. 'മരുഭൂമികൾ ഉണ്ടാകുന്നത്' എന്ന നോവലിൽ കുന്ദൻ പ്രതിനിധാനം ചെയ്യുന്നത് ഒരു വ്യക്തിയെല്ലാ, മൗലികാവകാശങ്ങൾ ഇനിയൊരിക്കലേങ്കിലും തിരിച്ചു കിട്ടുമോയെന്ന് നിരന്തരം ശങ്കിക്കുന്ന ഒരു പൗരസമൂഹത്തെയാണ്. രാജാജി ആസൂത്രമായൊരു നവരാഷ്ട്രനിർമ്മിതിയുടെ തകർക്കാനാവാത്ത സുരക്ഷാ മണ്ഡലമെങ്കിൽ, അതിൽ ചത്തത്തരയപ്പെടുന്നത് രാജ്യത്തിന്റെ തന്നെ നിലനിൽപ്പിന് ആധാരമായ പൗരസമൂഹമാണ്. ഇവിടെ കുന്ദന്റെ സഹജീവിപരമായ കാര്യങ്ങളും സ്നേഹവും അന്വേഷണവും തെളിയിക്കുന്നത് ശരിയായ ജനാധിപത്യവും പൗരധർമ്മവുമെന്ന് മിഥ്യയാധാരണയാണെന്നുതന്നെ. പൗരസമൂഹമെന്ന ജൈവാംശത്തിൽനിന്നും വേറിട്ട് സന്ധിബന്ധങ്ങൾ മുറിക്കപ്പെട്ട ഇത്തരം ജനാധിപത്യമായി ഭരണക്രമങ്ങൾ ചുവടുമാറ്റം നടത്തുമ്പോൾ, വ്യക്തിയും സമൂഹവുമെന്ന പരസ്പരബന്ധത്തിന്റെ അടിത്തറകൾ തകരുകയും ജനാധിപത്യത്തിന്റെ ജീവൻ നഷ്ടപ്പെടുകയും അത് ജീവച്ഛവമാവുകയും ചെയ്യുന്നു.

ജനാധിപത്യത്തെ ഒരു രാഷ്ട്രനിർമ്മിതി എന്നതിനേക്കാൾ സമൂഹനിർമ്മിതിയായി വിലയിരുത്തുന്ന ആനന്ദ കാലക്രമത്തിൽ രാഷ്ട്രത്തിനു സംഭവിക്കുന്ന പരിണാമത്തെ വിമർശനവിധേയമാക്കുന്നുണ്ട്. "രാഷ്ട്രത്തിന്റെ സ്വഭാവം അടിസ്ഥാനപരമായി യന്ത്രത്തിന്റേതാണ്. സമൂഹത്തിന്റെത് ജൈവവസ്തുവിന്റേതും. രാഷ്ട്രം അതിന്റെ യാന്ത്രികതമൂലം ഒരേ സ്വഭാവമുള്ള, ഒരേവിധത്തിൽ പെരുമാറുന്ന അച്ചടക്കമുള്ള മനുഷ്യരെ ആവശ്യപ്പെടുന്നു. ലംബമാനമായ വിധേയത്വമാണ് (Vertical loyalty) അതും അതിന്റെ ജനതയുമായുള്ള ബന്ധത്തിൽ പ്രകടമാകുന്നതും" (2013:157). സുലൈമാനും ഭോലയും ഡാനിയേലുമെല്ലാം ജീവിതത്തിന്റെ ഒരു മേഖലപോലും സാക്ഷാത്കരിക്കാനാവാതെ രാജാജി പദ്ധതിയിൽ തകർന്നുടയുമ്പോൾ ജനാധിപത്യവും പൗരാവകാശവും ഭരണനിർമ്മിതിയിൽ പുറംമോടികൾ മാത്രമായി നിലനിൽക്കുന്നു. ജീവിതത്തിന്റെ എല്ലാ മേഖലകളും പൂർത്തീകരിക്കാൻ സഹായിക്കേണ്ടുന്ന സാമൂഹ്യവ്യവസ്ഥയായ ജനാധിപത്യം അതിന്റെ ഒരു വശംമാത്രമായ ഭരണനടത്തിപ്പിൽമാത്രം ഊന്നൽ നൽകുമ്പോൾ സ്വേച്ഛാപരമായ അധഃപതനം സംഭവിക്കുന്നു. ഇവിടെ ഒരു ജനതമുഴുവൻ പുറംപോക്കുകളിലേയ്ക്ക് നീക്കപ്പെടുകയും അവരുടെ ആഗ്രഹങ്ങളും താല്പര്യങ്ങളും ഭരണകൂടത്തിനു മുമ്പിൽ ബലി ചെയ്യാൻ നിർബന്ധിതമാവുകയും ചെയ്യുന്നുവെന്ന് കുന്ദന്റെ അന്വേഷണങ്ങൾ വ്യക്തമാക്കുന്നു.

ഭരണകൂടങ്ങൾ അതിന്റെ നയങ്ങൾ നടപ്പാക്കുന്നതിനുള്ള ഉപകരണങ്ങൾ മാത്രമായി സമൂഹത്തെ ഉപയോഗപ്പെടുത്തുന്നു. മരുഭൂമിയിലും നഗരത്തിലുമുള്ള കുന്ദന്റെ അലച്ചിലുകളിൽ അവൻ കണ്ടെത്തുന്നത്, നവനിർമ്മിതിയിലെ ജനാധിപത്യം സൃഷ്ടിക്കുന്ന, വിധേയത്വത്തിന്റെ പുതിയ മനുഷ്യവാർപ്പുകളെയാണ്. മനുഷ്യസ്നേഹിയുടെ വിഷാദത്തോടെയാണ് കുന്ദൻ അവരുടെ ജീവിതത്തെ നോക്കിനിൽക്കുന്നതും. പൗരസമൂഹത്തിന്റെ എല്ലാ സംഘടനാപ്രവർത്തനങ്ങളെയും ചോർത്തിക്കളയുന്ന ഭരണകൂടം അവ



നിലെ ജൈവരൂപങ്ങളെ ഇല്ലാതാക്കി വെറും യാന്ത്രികനാക്കുന്ന തന്ത്രങ്ങളെ കുന്ദൻ തിരിച്ചറിയുകയും അതിനോട് പ്രതിഷേധിക്കുകയും ചെയ്യുന്നുണ്ട്. ചിന്തയും പ്രതികരണശേഷിയും നഷ്ടപ്പെട്ട് ഹൃദയം മരവിച്ച യന്ത്രങ്ങളായി പരിവർത്തനം ചെയ്യപ്പെട്ട ശരീരങ്ങളെ തിരിച്ചറിവിലേയ്ക്കു നയിക്കാനുള്ള കുന്ദന്റെ ശ്രമങ്ങൾ തിരിച്ചറിയുന്ന അധികാരസ്വരൂപങ്ങൾ അതു മുളയിലെ നുള്ളിക്കളയുകയും കുന്ദനെ ആക്രമിക്കുകയും ചെയ്യുന്നു. കുന്ദന്റെ, രംഭാഗട്ടിലൂടെയും നഗരത്തിലൂടെയുമുള്ള യാത്രകൾ വ്യക്തമാക്കുന്നത് അധികാരം മാറ്റിയെഴുതിയ ജനാധിപത്യത്തിലൂടെ ഈഷരമാക്കപ്പെടുന്ന ഒരു ജനവിഭാഗത്തിന്റെ ദുരന്തകഥതന്നെയാണ്. ഈ ദുരന്തചുഷണത്തെ ചോദ്യം ചെയ്യുന്നവന്റെ എല്ലാ പാതകളെയും തുറവിക്കളയും ഇരുട്ടറകൾക്കുള്ളിലാക്കുന്ന അധികാരത്തിന്റെ പ്രതീകാത്മക ചിഹ്നമായി നിലകൊള്ളുന്നു, മരപ്പച്ചകളെ വന്ധ്യമാക്കിയ നടപ്പാതകളെ കൊട്ടിയടച്ചുകൊണ്ട് ഉയർന്നു പൊങ്ങുന്ന കോട്ടകൾ. മനുഷ്യമഹത്വത്തിന്റെ അവതാരങ്ങളായി ഈ കോട്ടയ്ക്കുള്ളിൽ കയറാനും അതിജീവിക്കാനും ഒരിക്കലും സാധ്യമല്ലെന്നു പ്രഖ്യാപിക്കുന്നു ലംബമാനമായ ഈ കോട്ട നിർമ്മിതി.

സന്ധിചെയ്യപ്പെടാത്ത സന്ദേഹങ്ങൾ

ജനാധിപത്യത്തെയും പൗരസമൂഹത്തെയും ചുറ്റിപ്പറ്റിയുള്ള ആനന്ദിന്റെ രചനാപഥങ്ങൾ 'ഗോവർധന്റെ യാത്രകളിൽ' സന്ധി ചെയ്യപ്പെടാത്ത സന്ദേഹിയുടെ ചിന്താധാരകളാണ്. ഗോവർധന്റെയും അവനു ചുറ്റുമുള്ള പൗരസമൂഹത്തിന്റെയും യാത്രകളിലെല്ലാം കാലം എത്തിനിൽക്കുന്നത് സന്ധിയില്ലാത്ത തൂക്കുകയറുകളിലാവുന്നു. ആധിപത്യങ്ങളുടെ അതിരുകളില്ലാത്ത ബലപ്രയോഗത്തിൽ ഓരോരുത്തരും അവനവന്റെ ലക്ഷ്യത്തെമാത്രം മുൻനിർത്തി സർവ്വലോകത്തിന്റെയും മേൽ വിധിയെഴുതുമ്പോൾ പ്രകൃതിദത്തമായ അവകാശങ്ങൾ അപ്രാപ്യമായിരിക്കുന്ന ഒരു ജനസമൂഹം ഈ നോവലിൽ ഗോവർധനോട് ചേർന്നുനിൽക്കുന്നതായി കാണാം. ഒരുവന്റെ പ്രകൃതിദത്തമായ അവകാശങ്ങൾ അവനിൽ മൗലികമായി നിലകൊള്ളുകയും അനുഭവയോഗ്യമാവുകയും ചെയ്യേണ്ടതാണ്. ഇതിന്റെ നിഷേധം മനുഷ്യനുള്ളിടത്തോളം കാലം സ്വാതന്ത്ര്യം തേടിയുള്ള അന്തമില്ലാത്ത വഴികളിലൂടെ അവനെ യാത്രയാക്കുന്നു.

ഗോവർധന്റെ ആത്മസംഘർഷത്തിന്റെ യാത്രകൾ, കാലാതീതവും കാലം മെനഞ്ഞെടുത്തതും കാലം രേഖപ്പെടുത്തിയതുമായ ചില വ്യക്തികളുമായുള്ള സംവാദത്തിന്റെയും ഉത്തരമില്ലായ്മയുടെയും നീതിവിചാരണങ്ങളിലൂടെയാണ്. പ്രകൃതിദത്തമായ അവകാശങ്ങൾ തട്ടിത്തെറിപ്പിക്കുന്ന വിവിധകാലഘട്ടങ്ങളിൽനിന്നും ഒട്ടും വ്യതിരിക്തമല്ലാത്ത ജനാധിപത്യവ്യവസ്ഥയുടെ പുതിയ ചുഷണവ്യവസ്ഥകളുടെയും ആധിപത്യത്തിന്റെയും വക്രീയരേഖകളെ നീതിയുടെ കണ്ണുകളിലൂടെ നിർദ്ധാരണം ചെയ്യുകയാണ് ഗോവർധൻ.

മനുഷ്യന്റെ അവകാശങ്ങൾ പ്രകൃതിദത്തമായിത്തന്നെ നിലനിൽക്കുമ്പോഴും അവന്റെ വ്യക്തിപരത സമൂഹജീവിതത്തിൽനിന്നു തന്നെയാണ് ഉടലെടുക്കുന്നത്. സമൂഹത്തോടുള്ള അവന്റെ സഹജവാസനകളിൽ എത്രമാത്രം ദുഷിപ്പുകൾ ഏൽക്കേണ്ടിവന്നാലും അവയോട് സംഘർഷത്തിന്റെ മേഖലയിലെങ്കിലും ഉൾച്ചേരാൻ അവൻ കടപ്പെട്ടിരിക്കുന്നുവെന്നതിന്റെ തെളിവുതന്നെയാണ് ഗോവർധന്റെ യാത്രകളിൽ മനുഷ്യനോ മറ്റു സഹജീവികളോ കൂട്ടാളിയാവുന്നത്. 'ജൈവമനുഷ്യനിൽ' വേർപിരിയാനാവാത്ത ഈ സമൂഹപരത ആനന്ദ അവതരിപ്പിക്കുന്നുണ്ട് "എത്രതന്നെ വ്യക്തിത്വമാർജ്ജിച്ചാലും സമൂഹജീവിയായ മനുഷ്യൻ സമൂഹത്തിന്റെ ഒരു ഭാഗമെന്ന അവസ്ഥയിൽ നിന്ന് മോചനമില്ല. സമൂഹമാണ് അവന്റെ വ്യക്തിത്വത്തിന്റെ അടിത്തറ" (2012:22). സമൂഹവുമായുള്ള സഹവാസങ്ങളിൽ ഉടലെടുക്കാവുന്ന സ്വാഭാവികസംഘർഷങ്ങളെ നേർരേഖീയമാക്കുന്നതിനുള്ള സാമൂഹ്യവ്യവസ്ഥിതിയായിട്ടു തന്നെയാണ് ജനാധിപത്യമെന്ന മഹത്തായ ആശയം മനുഷ്യമനസ്സിൽ ഉദിച്ചത്. അതു മാറിയും മറിഞ്ഞും കാലോചിതമായി പരിഷ്ക്കരിക്കപ്പെട്ടും അവന്റെ വ്യാപാരങ്ങളിൽ വന്നു ചേർന്നിരിക്കുന്നു. എന്നാൽ യഥാർത്ഥ പൗരലക്ഷ്യങ്ങളെ പൂർത്തീകരിക്കാത്തൊരു സാമൂഹ്യസാഹചര്യത്തിൽ അധികാരത്തിന്റെ ഏജൻസികളായിത്തീരുന്ന രാഷ്ട്രത്തിന്റെ ഇച്ഛകൾക്ക് സമൂഹം ഇരയായിത്തീരുന്നു. ഇത് അസംബന്ധമായി തിരിച്ചറിയുന്ന ഗോവർധൻമാർ പ്രാന്തപ്രദേശങ്ങളിലൂടെയുള്ള യാത്ര തുടരുമ്പോൾ സ്വാതന്ത്ര്യമെന്നത് സന്ധി ചെയ്യപ്പെടാനാവാത്ത സന്ദേഹങ്ങൾ മാത്രമായി അവശേഷിക്കും.

തിരസ്കൃതരുടെ അപഹരിക്കപ്പെടൽ

തിരസ്കൃതമാകുന്ന ജനതയുടെ അപഹരിക്കപ്പെടുന്ന സ്വപ്നങ്ങളെ പുറംപോക്കുഭൂമിയിൽനിന്നും എഴുത്തിന്റെ വെളിച്ചത്തിൽ ഇഴുതിരിച്ചു കാണിക്കാനുള്ള അവതരണ പാടവമാണ് അപഹരിക്കപ്പെട്ട ദൈവങ്ങളിൽ നാം ചെന്നെത്തുമ്പോൾ. സ്വന്തം നാടും ദേശവുമെല്ലാം ഒരു ജനതയ്ക്കു സ്വപ്നദർശനം മാത്രമായിത്തീരുന്നു. നിഷേധിക്കപ്പെടുന്ന പൗരാവകാശങ്ങൾ അധികാരസ്വരൂപങ്ങളുടെ കണക്കെടുപ്പിൽ നിലനിൽപ്പ് അസാധ്യമാക്കുംവിധം നാടോടിത്തത്തിലേയ്ക്കും പലായനത്തിലേക്കും മേൽവിലാസം നഷ്ടപ്പെടുന്നവരിലേയ്ക്കും പടർന്നുവ്യാപിക്കുന്നതിന്റെ ഭീകരസ്വരൂപം നസീമയുടെയും ഗണേശിന്റെയും അമന്റെയും അവർ ജീവിക്കുന്ന ചുറ്റുപാടുകളുടെയും പശ്ചാത്തലത്തിൽ വായിച്ചെടുക്കാവുന്നതാണ്. ഒരു പ്രദേശവും രാഷ്ട്രവും സംസ്കാരവുമെല്ലാം ഒരു ജനതയുടെ നേതൃത്വത്തിന്റെ മാനങ്ങളെ അടയാളപ്പെടുത്താനുള്ള രേഖകളാകുമ്പോൾ അത്തരം അതിർവരമ്പുകൾപോലും അപഹരിക്കപ്പെടുന്നൊരു കാലഘട്ടം പിറന്നിരിക്കുന്നു. കൂട്ടിനുകൊണ്ടു നടക്കുന്ന ദൈവങ്ങളെയും പാരമ്പര്യങ്ങളെയും വലിച്ചെറിഞ്ഞ് നാടോടികളെപ്പോലെ പുറംപോക്കിലാവുന്ന ഒരു ജനത ആവിർഭവിക്കുന്നതിന്റെ രാഷ്ട്രീയം അതീവജാഗ്രതയോടെ ഈ ജീവിതങ്ങളിൽനിന്നും ചീന്തിയെടുക്കാനാവും.

സംഘർഷങ്ങളും കലാപങ്ങളും ഭീകരവാദവും ഫാസിസവും സ്ഥിരം കാഴ്ചകളാകുന്ന നഗരം അത്രമേൽ ജീവിതത്തെ അസന്തുഷ്ടമാക്കുന്നതും അതിന്റെ ആണിക്കല്ലുകളായ ജനതയെ അതിൽനിന്നും പുറത്താക്കിക്കൊണ്ടാണ്. സ്വന്തമായി ഒന്നും അവകാശപ്പെടാനില്ലാത്ത, ഒരു രാഷ്ട്രത്തിന്റെ പൗരനെന്ന ഐഡന്റിറ്റിപോലും നഷ്ടമാവുന്ന ജനതയുടെ വിലാപസ്വരം ഈ നോവലിലുണ്ട്. “ഇപ്പോൾ വരുന്നവർ അധികവും സംഘർഷങ്ങളും കലാപങ്ങളും ആഭ്യന്തരയുദ്ധങ്ങളുമൂലം അവരുടെ പ്രദേശങ്ങളിൽനിന്ന് പുറത്തുള്ളപ്പട്ടവരാണ്. സവിശേഷമായ ഒരു ഉദ്ദേശ്യവും വെച്ചല്ല, വെറും അഭയം തേടിയാണ് അവർ വരുന്നത്, ഭാവിയിലൂടെ സ്വപ്നങ്ങൾക്കു പകരം ഇന്നലെയുടെ വേദനകളും വിദേശങ്ങളും പേരി. അവർ ഈ നഗരത്തിൽ ഒരിക്കലും പങ്കാളികളാകുന്നില്ല” (2010:47).

ഏതൊക്കെയോ ദേശത്തിന്റെയും നഗരത്തിന്റെയും പൗരന്മാർ ആയിരുന്നവർ കാലക്രമത്തിൽ ഒന്നിന്റെയും ഭാഗമല്ലാത്ത വെറും സ്വപ്നാടകരായി മാറുന്നതിന്റെ രൂപമാറ്റംതന്നെയാണ് ഈ പലായനവും മറ്റൊരു തീരം തേടിയുള്ള യാത്രയും. അവർ ചരിത്രത്തിനും പൗരാവകാശങ്ങൾക്കും പുറത്താക്കപ്പെട്ട വെറും ജീവച്ചുവങ്ങൽ മാത്രമാവുമ്പോൾ അവർക്ക് ഇനി ഭൂതവും ഭാവിയുമില്ലാത്ത വർത്തമാനം മാത്രമാണുള്ളത്. ഭൂതകാലം അപഹരിക്കപ്പെടുകയും ഭാവിയെല്ലെ സ്വപ്നങ്ങൾ ഒന്നും ബാക്കി വയ്ക്കാതില്ലാതെ ജന്മനാടുകൾപോലും നഷ്ടപ്പെടുകയും ചെയ്തിരിക്കുന്നു.

നഗരങ്ങൾ പിറവിയെടുക്കുമ്പോൾ, അതിന്റെ ആരംഭഘട്ടത്തിൽ സ്വാതന്ത്ര്യത്തിന്റെ വായുവും സംസ്കാരത്തിന്റെ ഉയർച്ചയും അതിലടങ്ങിയിരിക്കുന്നുവെന്നത് അതിന്റെ നന്മകൾ തന്നെയാവണം. ഒരു പരിധിവരെ പൗരനും പൗരസമൂഹവുമെല്ലാം പരിഷ്കൃതിയുടെ ഭാഗമായിട്ടുതന്നെയാണ് ചരിത്രത്തിലും ഇടം നേടിയത്. എന്നാൽ ഈ ജനാധിപത്യഘടകങ്ങളുടെ പ്രതിരോധകോട്ടകൾ അടർന്നു വീഴുന്ന നഗരകാഴ്ചകൾ ഏറ്റവും തീവ്രമായിത്തന്നെ ഗണേശിനനുഭവപ്പെടുന്നുണ്ട്; ഭയവും അസ്ഥിരതയും അരിച്ചിറങ്ങുന്ന ഇടം മാത്രമാണ് നമുക്കു ചുറ്റുമുള്ളതെന്നും എപ്പോൾ വേണമെങ്കിലും നാം മുന്നിൽക്കൊണ്ടുവരെയെല്ലാം ദിവാസ്വപ്നങ്ങൾ മാത്രമായി അപഹരിക്കപ്പെടുകയും ചെയ്തേക്കാമെന്ന് പലവുരു ഈ നോവൽ ആവർത്തിക്കുന്നു. “നമ്മുടെ മഹാനഗരങ്ങൾ അശാന്തങ്ങളാണ്. നാളുകൾ ചെല്ലുംതോറും കൂടുതൽ കൂടുതൽ അശാന്തമായിക്കൊണ്ടിരിക്കുകയും ചെയ്യുന്നു. ഭയവും വിഭ്രാന്തിയും അവയെ ആവേശിച്ചിരിക്കുന്നു. അവയുടെ വായു ഇന്ന് മനുഷ്യനെ സ്വതന്ത്രനാക്കുന്നില്ല. അവന്റെ സ്വാതന്ത്ര്യം ഏതു നിമിഷത്തിലും അപഹരിക്കപ്പെടുകയും ചെയ്യാം” (2013:250) മെന്ന ആനന്ദിന്റെ ചിന്ത ഈ നോവലിന്റെ പ്രധാന ആശയങ്ങളിലൊന്നായി നിലകൊള്ളുന്നു. അപഹരിക്കപ്പെടുന്നതിന്റെ ദുരന്തത്തിൽ, നഗരവും ഗ്രാമവും വാസസ്ഥലങ്ങളുമെല്ലാം വാഗ്ദത്ത ഭൂമിയല്ലാത്ത താൽക്കാലിക ഇടമാത്രമായി ചുരുങ്ങുമ്പോൾ നീക്കുപോക്കുകൾ ഒന്നും ബാക്കിയില്ലാത്ത പുറംപോക്കു ജനതയായി മാറുന്നവരുടെ നിസഹായത ഇവിടെ രേഖീയമാവുകയാണ്.



ചുരുക്കത്തിൽ, കലാതന്ത്രങ്ങളെ ഭേദിച്ച് മാനവികതയുടെ വിവിധ മാനങ്ങളെ കൈകാര്യം ചെയ്യാനുള്ള മിക്കുന്ന ആനന്ദിന്റെ ചിന്തകൾക്ക് വിഷയീഭവിക്കുന്നവയാണ് ജനാധിപത്യവും പൗരദർശനവും നീതിബോധവും. ആനന്ദിന്റെ ഇവയെ വിശകലനം ചെയ്യുമ്പോൾ ദാർശനികതയുടെ ഉൾക്കനമുണ്ടെങ്കിലും ജനാധിപത്യത്തിനും നീതിബോധത്തിനും സംഭവിച്ചിരിക്കുന്ന സ്ഥാനഭ്രംശങ്ങളെ നിർദ്ധാരണം ചെയ്യുന്നത് വേറിട്ടൊരു കാഴ്ച തന്നെയാകുന്നു. വിപ്ലവാത്മകതയുടെ സ്വരമോ പ്രായോഗികതയുടെ പുതുവഴികളോ അതിൽ തെളിയുന്നുണ്ടോ എന്ന ചോദ്യം ബാക്കിനിൽക്കുമ്പോഴും രാഷ്ട്രത്തെ വിചാരണ ചെയ്യുന്നതിൽ ആനന്ദിന്റെ കല ഒരു പടികുടി കടന്നു നിൽക്കുന്നു. രാഷ്ട്രത്തിന്റെ അടിസ്ഥാനശിലയായ പൗരസമൂഹം നവനിർമ്മിതിയിൽ ജൈവികാവകാശങ്ങൾ നിഷേധിക്കപ്പെടുന്ന പുറംപോക്കുജനതകളാക്കപ്പെടുമ്പോൾ രാഷ്ട്രം അതിന്റെ ലക്ഷ്യത്തിൽനിന്നും വ്യതിചലിക്കുന്നു. ഇതാണ് ആനന്ദിന്റെ എഴുത്തുകളുടെ പ്രഖ്യാപിത സാരം. ജനാധിപത്യസംവിധാനത്തിലെ പൗരസമൂഹം കാലക്രമത്തിൽ അധികാരസ്വരൂപത്തിന്റെ രൂപമാറ്റങ്ങളിൽ പുറംതള്ളപ്പെടുകയും പലായനത്തിന്റെ കാലം അവരെ നാടോടികളാക്കുകയും ചെയ്യുന്നു. ഇവിടെ രാഷ്ട്രവും പൗരസമൂഹവും രണ്ട് തിരിവുകളായി പരിണമിക്കുന്നതിനെ അടയാളപ്പെടുത്തുകയും ചെയ്യുന്നു ആനന്ദിന്.

ഗ്രന്ഥസൂചി

1. ആനന്ദിന്, 2010, *അപഹരിക്കപ്പെട്ട ദൈവങ്ങൾ*, ഡി സി ബുക്സ്, കോട്ടയം.
2. ആനന്ദിന്, 2012, *ജൈവമനുഷ്യൻ*, ഡി സി ബുക്സ്, കോട്ടയം.
3. ആനന്ദിന്, 2012, 'കൈയൊഴിക്കപ്പെട്ട ധാരണകൾ' *സ്ഥാനം തെറ്റിയ വസ്തു*, മാതൃഭൂമി ബുക്സ്, കോഴിക്കോട്.
4. ആനന്ദിന്, 2013, *കണ്ണാടിലോകം*, കറന്റ് ബുക്സ്, തൃശ്ശൂർ.

FANS IN THEIR FICTIVE WORLDS: *SHERLOCK* AND THE HOMOEROTIC FAN FICTION

Mr. Viju Kurian
Baselius College, Kottayam

Abstract

Imitative art is nothing modern, when art itself was theorized as imitation of an ideal substance. What is modern is the proliferation of the form of fan fiction which can be loosely defined as any writing which explicitly imitates a fictional world or a part there of. It could be just the characters who are then exported to another setting, or the fictive universe itself transformed in a manner. Or a particular set of chemistry that exists in a subtle manner in the ‘original’ base text which is then bared out in an explicit manner. It could satirize or carry the same tone of the base text. In this paper, the attempt is to look at a variety of fan fictions available online which seeks to reverse notions of patriarchy and heteronormativity by reworking the gendered and sexual relationships in the base texts. This will also help to understand the ability to ‘talk back’ to the texts in ways that were previously unheard of. Finally, the future iterations in the genre are altered by these ‘user interventions’ (to lend a phrase from a digital design terminology) and how fundamental notions of authors and texts are themselves transformed by fan fictions.

Two events placed so distantly in time will suitably serve as the entry points for this discussion on fan fiction and their non-normative formulations. The first of these events happened exactly 400 years ago in Spain while the second has even not yet happened!

The first of these events happened a few years after the publication of Cervantes’s *Don Quixote* (1605), rightfully called the first modern novel in any language. After the success of the first book, the popularity of it inspired another



writer, who went by the name Avellaneda to write an unauthorised sequel to the adventures of the eccentric knight and his faithful squire (*Segundo tomo del ingenioso hidalgo don Quixote de la Mancha*). This provoked Cervantes to such an extent, he went on to write the sequel in 1615, discrediting the false sequel and its author. A fortuitous event, since the year of the publication of the sequel also saw the death of Cervantes. The point here being, the earliest fan fiction is as old as the earliest modern novel in history, also if not for the false sequel, we may never have had the authorized sequel.

The second event will happen in April 2016; the month being the proposed release of the latest Shah Rukh Khan movie, *Fan*, directed by Maneesh Sharma. Going by the bizarre trailer, one sufficiently gleans a coming-of-age tale of a hard-core fan Shah Rukh Khan, referred in the movie as Aryan Khan, (Shah Rukh Khan's footage from interviews and public appearances and movie scenes are shown) and towards the end of the trailer, we get to see the face of this fan, who turns out to be none other than Shah Rukh Khan himself, albeit with an altered face. So, basically a tale of Shah Rukh Khan's obsession with his persona being played by Shah Rukh Khan himself, creating an endlessly recursive subjectivity.

We live in an age of fandom. Fans associations which were once relegated as an 'uncivilised' aspect of Tamilian subculture is now very much part of Malayali culture. We see the digital space evolving into a platform for the unfiltered creative expressions in blogs, Wattpad and twitter. We listen to remixes and covers of songs as much as the 'original' songs. And occasionally, and casually, debate of the legality of it all.

Fan fiction can be loosely defined as works written after an 'original' or base text emulating the character/setting/plot or the relationships that are

hardly explored or side-stepped in the base texts. The base text in fan-fiction parlance has a word; it is called 'canon'. However, it is devoid of any presupposed, hegemonic overtones. It is essentially a tangential point from which fan fiction moves away. What is different about the modern fan fiction from the likes of Avalleneda is the sheer number of it, the prolific nature and the variety of the creations, and a medium which seems equipped and ready for it and more importantly, a culture which seems conducive for its production, distribution and consumption. The question then is, what aspect of the contemporary culture does fan fiction seem to derive its strength from? Is it simply that the medium of internet prompts/provokes such display of expressions? Or is it that, in a culture suffused with capitalist models of consumption and experience, fan fiction serves as another form of a product which enriches the consumption pattern further? The following paper tries a different approach; particular forms of fan fictions are looked at which seem to go against the normative rhetoric posed by the contemporary society and seeks to bring forth more inclusive models of social co-existence.

The Series and the Franchise

It is increasingly the books of fantasy fiction that easily renders itself to fan fiction. The enormous alternative worlds that authors of *Lord of the Rings*, *Harry Potter* or *Game of Thrones* have created make possible an immersive world which runs into several books and augmented by Hollywood adaptations. Readers swept into the elaborate plots are prompted to continue the stories. In their own imagination, fan fiction is the expressive result of creative minds.

The very existence of fan fiction and its prolific nature throws up questions of ownership, authorship and copyright. There are authors who clearly disdain such imitations. In the BBC documentary *Homer, Hagrid and*



the Incredible Hulk one author responds to the fan's explanation that he was merely filling the gaps where the author has sidestepped in the 'canon'. The author's response is that this is merely fallacy and that he has left out what he left out, out of authorial discretion. A counter example comes further up in the documentary where another author, Marc Zicree however found enough financial backing from a fundraising platform consisting of the fan base of his books (*Space Command* series) to support the movie version of his books without the help of big studios. The choice of choosing an independent platform would give the author more control over the movie version. The paradox of authorial choices loom large in these examples.

George R.R. Martin, the author of the adventure series, *A Song of Ice and Fire*, which inspired the hugely successful HBO television series *Game of Thrones*, recently updated his blog with some 'sad news.' (Martin) The sixth book in the series (*The Winds of Winter*), which was bound to release last year is delayed as he could not meet the deadline. In itself a distressing news for the fans of the series, it brought up another problem, the television series has been following the plot from the books which were already released. Now in February when the next season of the show starts, the show would overtake the published books. His long apology frequently found recourse to fan expectations, though not overtly, and one could not but imagine that, the modern writer's biggest source of inspiration and pressure, will be the fans themselves, who eagerly awaits the books and its adaptations.

The Politics of Fandom

Apart from the legal questions that fan fictions throws up, they bring to sharp focus the authorial death pronounced decades ago by Barthes. Barthes wasn't talking about the literal death of the author, but the metaphorical death knell of authoritative meaning, finding its ultimate source in the author.

Fandom radically revisits this notion, rendering the author's work only a tangent to surge forth and explore further. But the politics of fan fiction lies in another dimension too. It is in questioning the accepted, patriarchal, heteronormative relationships that inform the contemporary society that fan fictions can emerge as the new genre reflecting the culture of the changing times. A series of fan fictions which gained popularity recently has as its 'canon', the cult classic Sherlock Holmes stories by Arthur Conan Doyle.

The Homoerotic Sherlock Holmes

The intellectual friendship between Dr. Watson and Sherlock Holmes have been inspiring detectives spawning fan fictions across the world ever since Arthur Conan Doyle published the varied adventures of the astute detective and his close aide. It also spawned a number of television and movie adaptations, one the latest being the hit BBC series *Sherlock* (2010 onwards) starring British actors Benedict Cumberbatch as Sherlock Holmes and Martin Freeman as John Watson and penned by Steven Moffat. The palpable chemistry of the duo working together and solving cases and their friendship, each inspiring and supporting the other is given a cool intellectual friendship which is almost romantic. Fan fictions, spawned by the show took this very literally. The many popular fan fictions which followed the TV series mostly featured Watson and Holmes in an erotic relationship as an inevitable addendum to their intellectual partnership. As evident from such titles, *A Gay of Shadows* or *The Taming of Watson* all suggest an erotic relationship which is seldom there in the 'canon'. Instead of dwelling on speculative work, the fan fiction couple are all about gay romancing.

The plots of these fictions are suitably placed between two episodes of the show. For example, *A Confession* in which Watson confronts Holmes with his confession is "set shortly after the first episode of Sherlock entitled



“A Study in Pink” (Yaoifangirl). This might end the speculation where exactly this might have happened. This fills in the gap between two episodes, offering a faux narrative continuity to the show itself. Watson and Holmes are in constant company of each other and it seems the television episodes are teeming with sexual energy which only the fan fictions seems to realise.

What is political about these romantic adventures are not merely the interventions that these authors make of the ‘canon’. It is the reversal of heterosexual expectations that such situations throw up. In order to ‘naturalise’ homosexuality on par with heterosexuality, the reading of homoeroticism into traditional friendships seems necessary. This reversal of norms goes against the venerated forms of asexual friendships which seems to normalize heterosexuality. These fan fictions pick a fight with such a tradition and tries to render ‘normal’ asexual friendships as charged with not only friendly affection, but also with sexual energy.

The portrayal of sexual relations between Watson and Holmes as the selective highlighting of it above their detective adventures is a choice that the creator of the fan fiction makes. Their attempt is not to continue the characters in the plot, but to recast them in a homoerotic relationship, as if making explicit their inner feelings which rarely finds any place in the shows.

What suggests romance and sexuality in art and literature is the closeness of the characters and their working together which later develops into a full-fledged relationship, but only if the characters are of opposite sex. In a hypothetical drama scenario, we tend to expect a relationship between a man and woman who are engaged to some common unromantic cause even if the plot hints at nothing of the sort. The question fan fiction writers seem to ask is: why should it suggest romance only when it is a man and woman on screen?

The playful dialogues from the series itself renders itself to such readings, even though the writers have not made this choice explicitly. In the episode *The Blind Banker* there is a playful chat between Watson and Holmes regarding Watson's upcoming date with his new employer Sarah:

Holmes: I need to get some air.

Watson: Actually, I've got a date.

Holmes: What?

Watson: Where two people who like each other go out and have fun?

Holmes: That's what I was suggesting.

Watson: No, it wasn't. At least, I hope not. (Sherlock 2010)

It is this homosocial relationship that finds potential explorers of homoeroticism in *Sherlock* fan fictions.

Many scholars write of Sherlock Holmes fan fiction as essentially transformative in nature. They transform not only Conan Doyle's work but also the numerous adaptations of it. The co-creator of the Sherlock TV show, Steven Moffat repeatedly claimed that the Holmes that he has created is not gay.

It's a funny thing when a character for over 100 years has been saying, 'I don't do that at all.' He's been saying it over 100 years! He's not interested in [sex]. He's willfully staying away from that to keep his brain pure—a Victorian belief, that. But everyone wants to believe he's gay. He's not gay. He's not straight. And Doctor Watson is very clear that he prefers women. People want to fantasize about it. It's fine. But it's not in the show. (Hibberd)



Even though his view on fan fiction is quite generous, when one considers the fact that his version of Sherlock is a fan fiction in itself. The new Holmes, the creators decided, will be updated to the times.

He would lose his deerstalker and tweeds, but gain a smartphone and nicotine patches. He wouldn't say: "Elementary, my dear Watson." He would be younger, and technologically cutting-edge – just as Doyle had written him. (Jeffries)

By improvising from the 'canon', Moffat was essentially creating fan fiction himself. He claims his own Holmes is 'authentic,' closer to the original. Fan fiction writers make no such claims. Their aim is to work through the 'canon' and fill in the gaps. And their working through this turns out to be writing that "continues, interrupts, reimagines or just riffs on stories and characters other people have already written about." (Jamison 17)

It is easy to dismiss the art of fan fiction as trivial and existing on borrowed popularity of the 'canon' with no lasting value in itself. What is important however is the value that it imparts to the present-day culture. Gay fan fiction tries to suggest alternatives to normative relationships showing us that the neutrality of such scenes gives the scope of infinite play. This improvisation can undermine normative cohesiveness of patriarchy, colonialism and heteronormativity. Essentially, they criticize the original work and its normative world and not stopping at that (like a cultural critic would do), but goes on to create a world that is more inclusive than the one described in the 'canon'. This forms the basis of the political questions that fan fictions can bring to the table.

Works Cited

- "Homer, Hagrid and the Incredible Hulk." BBC Radio 4 FM. 17 Oct. 2015. Internet Radio. <<http://www.bbc.co.uk/programmes/b06hk68g>>
- "SHERLOCKED: Steven Moffat Talks Fan Art and Fan Fiction." *www.sherlockology.com*. 03 June 2015. Web. 12 Jan. 2016.
- Hibberd, James. "Sherlock Co-creator: For the Last Time, Holmes Is Not Gay!" *'Sherlock' Co-creator: For the Last Time, Holmes Is Not Gay!* Entertainment Weekly, 30 Mar. 2015. Web. 12 Jan. 2016.
- Jamison, Anne Elizabeth. *Fic Why Fanfiction Is Taking over the World*. Dallas, TX: Smart Pop, 2013. Print.
- Jeffries, Stuart. "'There Is a Clue Everybody's Missed': Sherlock Writer Steven Moffat Interviewed." *The Guardian*. *The Guardian*, 20 Jan. 2012. Web. 10 Jan. 2016.
- Martin, George R.R. "Last Year (Winds of Winter)." *Not A Blog*. Livejournal, 2 Jan. 2016. Web. 13 Jan. 2016
- Porter, Lynnette R. *Sherlock Holmes for the 21st Century: Essays on New Adaptations*. Jefferson, NC: McFarland, 2012. Print.
- Sherlock: Season 1, Episode 2 The Blind Banker*. Dir. Euros Lyn. Perf. Benedict Cumberbatch, Martin Freeman. BBC, 2010. TV Episode.
- Yaoifangirl. "Confession Chapter 1, a Sherlock Fanfic | FanFiction." *Confession Chapter 1, a Sherlock Fanfic | FanFiction*. <https://www.fanfiction.net>, 10 Aug. 2010. Web. 12 Jan. 2016.



THE NEED OF A NEW THEORY OF VISUAL RHETORIC IN SEXIST ADVERTISEMENTS

Ms. Sabitha Zacharias
Bharata Mata College, Thrikkakara

Abstract

This paper argues that the image of an ideal woman as presented in the advertisement is harmful and the sexist media presents the audience with inaccessible or objectified images of femininity. The increase in the rate of cosmetic surgeries, eating disorders, and related deaths reveals how mediated images of the ideal woman effect female self-image. Using a sociological perspective, an attempt is made to explore the effect of unabated objectification of women in the society and the need of a new discourse that empowers women in advertisements.

Advertisements have been called ubiquitous, inexorable, and one of the most important cultural factors affecting modern society (Williamson 8). Advertising has changed women's image whenever the need to create a market called for it. The representation of women in the advertisements has always been manipulative and exploitative. Social trends underline how the media and its ideal image of femininity have impacted women in unprecedented ways. Thus advertising serve as a recorder of the century's cultural revolution in the external and internal lives of women.

Women are commonly portrayed in one of the two following ways: either in their conventional role as a mother -natural, compassionate, helpful and supportive or as the exact opposite, the object of desire, the feminine being a symbol of eroticism and female accomplice to man's heterosexuality. Both of the above images of women in advertising are linked to beauty, youthfulness and fragility and serve as decorations for various products.

Portraying woman as an object is not constrained to any one category of product, but it is so astounding that every product eventually is made related to sexuality and the young woman becomes the prize or award in return for using that product. Advertising visuals have objectified women to the extent of portraying women as a mere sum of their body parts, denigrating their intelligence and uniqueness. The advertisements make girls and women feel ridiculous if they do not conform to the image projected in the advertisements. Women are shown wearing revealing outfits and take leaning and yearning postures similar to that of animals. Women and their body parts sell everything from food, clothing, cars, computers, men's shaving lotion to briefs. Even in commercials of the products consumed mostly by men - alcohol, tobacco, cigarettes; women are used as models exposing their body parts. Glamour dolls in front of cameras and world-class photographers do the same behind the lenses, trapping thousands of teenagers believe in the miracle of the product.

Body-chopping in advertisements occurs more repetitively for women than men. By omitting the head, face and feet, the advertisement states the idea that what matters about women lies between her neck and knees. It reduces women to merely reproductive figures, not praised for their logical abilities. Dismemberment in advertisement leaves a sensation of disconnected entities. This objectification and sexploitation has changed the rules of society and along with it the attitudes of men and women have changed. Such influential images contaminate our cultural milieu.

The Canadian sociologist and writer, Erving Goffman, has had great impact on the field of gender and advertising. In his influential book *Gender Advertisements* (1976) he discusses how advertising confirms the stereotypes connected to women. His research is based on five categories with coded



markers that can be used in order to identify gender roles in advertisements. The categories, called relative size, feminine touch, function ranking, ritualization of subordination, relative size, and licensed withdrawal, refer to how women are likely to be portrayed in advertisements.

Relative size implies that women are in general pictured as shorter than men and this signal less authority. Only when a man is a woman's social inferior he is shorter than her. Feminine touch shows that objects are caressed, touched or held by women, never grasped, shaped or manipulated. Function ranking indicates that men are portrayed in executive roles, giving women instructions especially in occupational roles. Women are more often shown receiving help than males. This kind of subordination is also active when the target group is women. Men are underrepresented in portrayals of the nursery and the kitchen or when they are shown in these female domains they are represented in an unrealistic way. Ritualization of subordination states that women are likely to be physically subordinated by demonstrating canting postures, offering smiles of approval or by having her sitting on a bed when a man is standing up. A man can accord her authority, when she is engaged in a pursuit, by his extended arm, which marks his social property and guard against encroachment. Women are portrayed in clowning and costume-like characters while men are displayed in gear they are totally serious about. Licensed withdrawal suggests that women are pictured psychologically drifting from the social scene, which leaves women disoriented for action, for example, when being close to a male her face is dreamy and lost as if his readiness and aliveness to the surrounding scenes were enough for both of them. She is being saved from seriousness, for example, in uncontrolled ecstasy over chocolate scented perfume. Gender roles are revealed in family portrayals. For example, women are shown more akin to their daughters than men are with their sons. Also, the father is portrayed standing a

little bit away from the family since that distance is required for his protectiveness.

In the advertisements women are primarily used to promote products and services. In every item they are utilized whether it requires their presence or not. From these advertisements a desirable value can be discerned. Fair complexion, slim and beautiful looking women are the ideal ones. These traits only ensure a good life. Even dark complexion, it is propagated, is the major hindrance for self-development even marriage. Being fair, the adverts convince, is the secret of success. Utmost care is taken to manipulate the minds of young women that being overweight, having dark features are hindrances for their self-development. Fairness creams and beauty soaps are showering promises to make their dreams come true. Diets are being suggested to maintain figures. Even creams have been innovated to conceal the age.

Fredrickson and Roberts asserted that women of varying degrees internalize this outsider view and begin to self-objectify by treating themselves as an object to be looked at and evaluated on the basis of appearance (173 – 206). Self-objectification manifests in a greater emphasis placed on one's appearance attributes rather than competence-based attributes and in how frequently a woman watches her appearance and experiences her body according to how it looks. Objectification theory posits a mediation model that may explain how self-objectification leads to women's mental health risks via negative psychological outcomes.

More specifically, Fredrickson and Roberts postulated that self objectification can increase women's anxiety about physical appearance; reduce opportunities for peak motivational states or flow; diminish awareness



of internal bodily sensation; increase women's opportunities for body shame; and increase women's anxiety about their physical safety, which in turn can lead to disordered eating, depression, and sexual dysfunction.

Thus the majority of advertisements and images starring women lend some advice on how to improve one's sense of low esteem. There is a paradox in the advertisement culture. On one hand, enjoying rich and expensive meals is portrayed as a "fitting reward for hard work" (Stephens1), and on the other hand women are expected to be fit and thin. Stephens argues that the obsessive diet-mindedness in advertising provides a contract with the hedonistic attitude towards food. In several magazines, even food advertisements focus more on dieting than on quality. *Safola Masala Oats* advertisement with the tag line *Mazedaar Khao, Jee Bharke* spreads the delusion that women are living their lives only in pieces thinking of the weight gain and even for a tummy full meal one needs to wait for low calorie food like oats.

A very important role of the media is not only to promote thinness but also fake bodies created on a computer screen. Sometimes, women soak up the false image of thinness. "Digital manipulation," (70) as Carstarphen calls it, can stretch bones, or clone bones on a body. Mia Consalvo observes the irony in the fact that new technology fabricates beautiful images and then labels them as "natural look" (Carstarphen 71). The *Dove Campaign for Real Beauty* launched by Unilever in 2004 claimed to celebrate the natural physical variation embodied by all women and to inspire them to have the confidence to be comfortable with themselves. But at the same time the campaign has been criticized on the grounds that Unilever produces *Fair and Lovely*, *Axe* and *Slim Fast* diet bars. Photo retoucher Pascal Danguin, who works for Box Studios in New York, told *The New Yorker* that he made edits

and retouched the photos to smooth the appearance of the women's skin, hide wrinkles and blemishes, fix stray hairs, etc.

According to Louis Grubb, another leading New York retoucher, “Almost every photograph you see for a national advertiser these days has been worked on by a retoucher to some degree...Fundamentally, our job is to correct the basic deficiencies in the original photograph or, in effect, to improve upon the appearance of reality” (Jacobson and Mazur 11).

According to Carstarphen, many fashion editorials promote this natural look. But the natural look is itself fake, the result of digital enhancements. Therefore, what women are trying to achieve is actually a fabrication of science and technology. Consalvo argues that women in magazine can never be “too rich, too thin, too white” (Carstarphen 71). The same critic, Carstarphen, mentions that physical appearance and image factors are important cultural elements. Comparing themselves to the images in the magazines, women become obsessed with their outer shell, finding dissatisfaction with their own bodies, losing their self-assurance and resorting to different diets in order to be thin.

For years women were second class citizens to men due to economy and health reasons, those reasons cease to exist, so a new subtle method has come along. These images of female beauty are used to keep women in their place. Naomi Wolf in *Beauty Myth* says not only this, but she proves that throughout the years, there have been forces in culture that attempted to punish women who seek more control over their lives and environment. The beauty myth is the most dangerous in a long list of lies. It is dangerous because women's reactions to the media are increasingly obsessive, creating psychological problems. Energy that might be used to further positive goals



is turned inward instead; dissipated in guilt, shame and unhappiness at ones physical faults. Back when women were all homebodies and housewives, little did they know that they were being manipulated into doing so. Marketers would advertize the therapeutic value of cleaning and cooking, they would show new and improved household products and made women believe housework was a matter of knowledge and skill rather than a matter of brawn and dull.

The beauty myth also convinces women to willingly go hungry, to eat fewer calories per day than famine victims in third world countries, which ironically results in weight gain and/or eating disorders. Wolf talks about how the beauty myth actually suppresses female sexuality by making many women too self conscious to engage in sex freely and comfortably. Also, excessive dieting leads to a diminished sex drive and it gives men the role of the appraiser rather than the partner, which in turn, further impacts sexual relations and of course female downfall into submissivity.

Violence not domestic, but self inflicted, due to plastic surgery can be seen as another harmful ideal that affects the female. Wolf questions why so many women are willing to risk diminished erotic responses and even death in order to be made thin, small nosed, or big breasted. From this question, we can conclude that culture implies that women are better off dead than old or ugly looking, making it a reasonable risk. Media has subconsciously degraded women so much that some women feel they are no more than an object or symbol.

The dominant popular discourse, for instance, only accentuates the fact that women, in the majority of societies around the world, live lives of spectacle. Mulvey categorizes women as, “the bearer of meaning, not maker

of meaning” (58). As Mulvey’s statement suggests, unlike males, females seldom find themselves in the role of spectator, or in the case of media, in the role of control. Women are the objects while males are generally the subjects and the camera almost always assumes the gaze of the male. Therefore it is he who moves the action while women have little access to the camera and control of the narrative. The camera seems to constantly watch women as it does not do with men. Almost always the camera assumes a male perspective and a male gaze in the narrative. It is the male that the audience, whether male or female, relates to because it is a male gaze that moves and controls the camera. Mulvey explores the reasons for this strident male control by delving into Freud and psychoanalytic discourses.

Many women are finding themselves in a vicious cycle that could, and often times does, include low self-esteem, depression, eating disorders, sexual assault and harassment, and an overall feeling of discontent as a result of a desire to emulate a visual standard that is near impossible to achieve. Some people are reading women’s modeling as an urge or desire to be treated or used as the object the media portrays them as. The result is an unpredictable dance between a woman and her environment and even though in the beginning she is seemingly satisfied, later it leads to severe depression when the attention is taken away. Women are then coerced to repeat the cycle by seeking out new forms of approval. Meanwhile, to achieve the title of sexy or desirable, intimate relations continue to lose meaning, resulting in high-risk behavior. Also, there is the sad reality that some of these women will fall victim to assault, harassment, or stalking, which will no doubt serve as a detrimental obstacle in achieving contentment.

Despite the physical, cognitive, emotional, and spiritual obstacles in the quest to achieve idealized beauty, women continue to chase it. While any



woman stuck in the spider's web has different reasoning for prescribing to these ideals, it seems quite consistent that the failure to obtain the beauty standards often leads to great body dissatisfaction and a probable inability to find peace. To combat sexism and objectification, society must reshape its patriarchal framework and move towards more egalitarian standards. However, with the media consistently flashing the ideal around every corner the likelihood of self-acceptance and a less judgmental society seems near impossible. Therefore, working towards a society where women can walk safely down the street without fear of assault, or can look in the mirror without negative mental and physical consequences begins internally and hopefully effects the external environment. "When society asks so little of women, every woman has to listen to her own inner voice to find her identity in the changing world" (Betty Friedan 407).

Bibliography

- Bandura, Albert. "Social cognitive theory: An Agentic Perspective." *Asian Journal of Social Psychology* 2(1999):21-41. Print.
- Carstarphen, Meta G. *Sexual Rhetoric: Media Perspective on Sexuality, Gender and Identity*. London: Greenwood Press, 1999. Print.
- Erving Goffman, *Gender Advertisements*, New York: Harper Torchbooks, 1987. Print.
- Fredrickson, B. L., & Roberts, T. "Objectification theory: Toward Understanding Women's Lived Experiences and Mental Health Risks". *Psychology of Women Quarterly* 21 (1997): 173-206. Web. 3 Jan. 2015.
- Friedan, Betty. *The Feminine Mystique*. New York: W.W Norton & Company 1963. print
- Goldman, R. *Reading Ads Socially*. London: Intype Ltd, 1992. Print.

- Jacobson, Michael F and Mazur, Laura Ann., *Marketing Madness*. Colorado: Westview Press, 1995. Print.
- Jaggi, Ruchi. "Representation of Women in Indian Television Advertising: Situating the discourse in the 'Fair & Lovely Ad Campaign.'" *The Journal of Computer Science, Management & Journalism* 8.2 (2013): n.pag. Web. 20 Feb. 2015.
- Mulvey, Laura. "Visual Pleasure and Narrative Cinema." *Screen* 16. 4 (1975): 6-18. Print.
- Nicholl Berberick, Stephanie. "The Objectification of Women in Mass Media: Female Self- Image in Misogynist Culture." *The New York Sociologist*, 5(2010): 54-67. Print.
- Piety, Tamara R. "Onslaught: Commercial Speech and Gender Inequality." *Case Western Reserve Law Review* 60.1 (2009): 47-93. Web. 28 Dec. 2014.
- Raina, Anshu. "Representation of Indian Women in Advertisements." *Quest Journals* 2.12 (2014) : 44-48. Web. 15 Jan. 2015.
- Renzetti, Claire M., Curran, Daniel J., and Maier, Shana L. *Women, Men, and Society*. Boston: Pearson, 2012. Print.
- Singh, Amartya. Jagadeesh R, Ram Sevak "Gender Sensitivity & Indian Advertising". 7 Dec. 2010. blog. 21 Nov. 2014.
- Szymanski, M., Lauren B., Moffitt and Erika R. Carr1,. "Sexual Objectification of Women: Advances to Theory and Research" *SAGE* 39.1(2011): 6–38. Print.
- Williamson, J. *Decoding Advertisements: Ideology and Meaning in Advertising*. London: Marion Boyars, 1978. Print.
- Wolf, Naomi. *The Beauty Myth: How Images of Beauty Are Used against Women*. New York: Perennial, 2002. Print.
- "Women's Role in Advertisements". 5 August 2011. blog. 15 Nov. 2014.



A STUDY ON AWARENESS LEVEL OF SALARIED CLASS ON TAX LAWS AND TAX PLANNING MEASURES

Dr. Geetha C.A

PG and Research Department of Commerce
The Cochin College, Kochi-2, Kerala.

Abstract

Tax planning is of utmost importance from the point of view of every income tax assesses having income from salaries. It not only ensures proper compliance with the provisions of the tax laws but also to see that the incidence of tax is reduced to the minimum possible extent and there by securing that the money remaining after payment of tax is kept at the maximum level. A better understanding about tax laws and tax planning measures available under the Act would be helpful to reduce the tax burden to the minimum level. The present study has been undertaken to evaluate the extent of awareness of salaried income tax assesses on various provisions relating to tax laws and tax saving opportunities. The overall conclusion derived from the study is that employees exhibited high level of awareness on most of the factors considered for the study but with differences across categories.

1. Introduction

The salaried employees constitute a sizable class of tax payers who contribute to the public exchequer about 12 percent of the total revenue collection by way of income tax. Their income is assessed under the head *salaries*. Tax planning has assumed special importance for the salaried class of tax payers in view of the mounting pressures of inflation, price hike and

their strict obligation to tax compliance. It is, therefore, essential for this class of tax payers to know their tax obligations in the right perspective and the measures of tax planning available to them so that they can make the best use of their earnings by reducing the incidence of tax. Thorough and up to date knowledge of the tax laws is necessary to avail the benefits provided under the provisions of the Act and their by ensuring that the 'take home pay' is kept at the maximum possible monetary level. However, efforts from the part of the assesseees to plan their savings and investments so as to minimize the incidence of tax is not up to the mark. There are numerous reasons for this ranging from lack of awareness of taxation laws to complexities in the compliance formalities.

Tax planning is possible through appropriate savings and wise investment decisions. Tax payers normally turn away of their tax liability only towards the end of the financial year. This leaves them with little option to invest or save with the available income. The real issue would relate to having awareness on the numerous provisions that would help in reducing the tax liability Hence the present study is an effort to evaluate the awareness level of salaried income tax assesses of the State on tax laws and tax planning measures and to understand whether there is any significant difference between the awareness level of employees of private sector and public sector under various income groups.

2. Review of Literature

The Income Tax Act 1961 has been subjected to numerous amendments since its passage fifty five years ago. It has been considerably revised not less than thirty six times by amendment acts besides the amendments carried out through fifty five annual Finance Acts since the introduction of the Act. As a result of all these amendments the basic structure of the Income Tax Act



has been overburdened and its language has become complex and difficult to understand. Rajani Bedi (2007) studied and evaluated the performance, reforms and incentives of personal income tax system in India and observed that changes in tax laws should be made to the minimum extent to reduce complexity in tax laws. Joy .K.J (1997) identified that a wise tax plan with thorough knowledge of the exemptions of the existing tax system could reduce much of the tax burden. Sunnykutti Thomas (1998) studied tax planning practices among the salaried people of Kerala to judge the extent of awareness and compliance of tax planning schemes among the salaried people. The study revealed that there was a significant variation among the employees of different employment sector as regards the tax planning schemes selected by them. The present study also reviewed the following Committee Reports on Direct Tax Reforms: Tax Reforms Committee (1991), Advisory Group on Tax Policy and Tax Administration for the Tenth Plan (2001) and Task Force on Direct Taxes (2002).

Various studies reviewed the performance of personal income tax in India and examined changes in respect of deductions and exemptions available to individual tax payers under the Income Tax Act and its impact on them. The awareness level of assesseees on tax reforms and the resulting tax planning measures need to be assessed for a better understanding of the effectiveness of such reforms .

3. Objectives and Methodology

The objective of the paper is to ascertain the level of awareness of the salaried class on various tax planning measures available under the Income Tax Act. The study is analytical as well as descriptive in nature. It makes use of both primary and secondary data. Secondary data for the study was collected from annual reports of All India Income Tax Statistics, Finance

Acts of various years, and circulars and notifications of Central Board of Direct Taxes.

Primary data was collected through a structured questionnaire. Salaried class income tax assesses working in the State of Kerala constituted the population for the study. Purposive sampling method was adopted to select the sample size. The sample for the study consisted of six hundred salaried employees working in the State of Kerala who were income tax assesses for the Financial Year 2014-15. Three hundred respondents each from the private sector and the public sector constituted the total sample size. In order to make the sample size geographically representative, Trivandrum, Ernakulam and Kozhikode districts were opted for the study representing South, Central and Northern part of Kerala respectively. Out of the two hundred sample respondents selected from each district, each hundred respondents represented the private sector and the public sector. On the basis of level of income, the sample respondents were classified into four income groups. Employees having annual salary income of below Rs.5 lakhs constituted the Low Income Group. Employees having annual salary income of Rs.5 to Rs.8 lakhs constituted Lower Middle Income group and Rs.8 to Rs.10 lakhs constituted the Upper Middle Income group. The high income group consisted of employees having annual salary income above Rs.10 lakhs. The proportion of the sample to various income group was 4:3:2:1. (Income wise category of personal income tax assesses for the year 2014 showed that 89 percent of the assesses belonged to taxable income below Rs.5 lakhs, 9.72 percent under Rs.5 to Rs.10 lakh and 1.28 percent constituted the above 10 lakh). Thus 240 respondents (40%) constituted the first category of below Rs.5 lakh, 180 employees (30%) constituted the income group of Rs.5 to Rs.8 lakh, 120 employees (20%) came under the



income group of Rs.8 to Rs.10 lakhs and 60 employees (10%) constituted the high income group.

The level of awareness about various deductions available under the Income Tax Act were analysed considering both head specific deductions and deductions available under Section 80C of the Act. For this purpose a three point scale was used assigning three point weightage to fully aware, two for partially aware and one for unaware. Analysis was undertaken based on mean values for the total respondents in each sector, where the mean value was above 2.5, the level of awareness was considered to be high, and the same was considered to be low, when it was below 2.0. Table.1 represents the interpreted level of awareness based on mean value.

Table 1: Interpreted Level of Awareness

Mean Value	Interpreted Level of Awareness
Above 2.5	High
2.0 - 2.5	Moderate
Below 2.0	Low

Source: Data Analysis

The following deductions under the Income Tax Act were identified to study the awareness level of employees.

1. Professional Tax
2. Interest on Housing Loan
3. Capital Gain arising from transfer of property used for residence
4. Life Insurance Premium
5. Contribution to Statutory Provident Fund/Public Provident Fund

6. Investment in National Savings Certificate / Post Office Time Deposit Schemes
7. Subscription to Mutual Funds
8. Repayment of Housing Loan (Principal Component)
9. Fixed Deposit in Scheduled Banks/Housing Finance Corporation for not less than 5 years
10. Contribution to Pension Fund
11. Deduction in respect of Medical Insurance Policy
12. Deduction in respect of Medical Treatment of Handicapped Dependents
13. Interest on loan taken for Higher Education
14. Donation to Charitable Funds
15. Relief in respect of Arrear Salary/ Advance Salary

Hypothesis

The hypothesis for testing was:

There is no significant difference between the employees of the private sector and the public sector with regard to income groups and their level of awareness about deductions available under the Income Tax Act.

Chi-square analysis was used for testing hypothesis.

4. Results and Discussion

4.1 Response of Low Income Group

With regard to the private sector, the level of awareness was high on 'contribution to PF' (2.81), 'life insurance premium' (2.71) and 'professional tax' (2.56). The level of awareness was moderate on 'deduction in respect of medical insurance policy' (2.47), 'interest on housing loan' (2.40),



‘contribution to pension fund’ (2.33), ‘investment in NSC and POTD’ (2.32), ‘fixed deposits in scheduled banks’ (2.23), ‘repayment of housing loan’ (2.15), ‘donation to charitable fund’ (2.10), ‘subscription to mutual fund’ (2.07), ‘capital gain’ (2.02) and ‘interest on loan taken for higher education’ (2.01)). The level of awareness was low on ‘treatment of handicapped dependents’ and (1.93), ‘relief in respect of arrear salary/advance salary’ (1.68) . In the public sector the level of awareness was high on ‘professional tax’ (2.79), ‘insurance premium’ (2.78) and ‘contribution to PF’ (2.78). The level of awareness was moderate on ‘investment in NSC and POTD’ (2.43), ‘interest on housing loan’ (2.38), ‘deduction in respect of medical insurance policy’ (2.18), ‘repayment of housing loan’ (2.16), ‘relief in respect of arrear salary/advance salary’ (2.08), ‘donation to charitable fund’ (2.1) and ‘contribution to pension fund’ (2.0). The level of awareness was low on ‘fixed deposits in scheduled banks’ (1.98), ‘interest on loan taken for higher education’ (1.91), ‘subscription to mutual fund’ (1.82), ‘treatment of handicapped dependents’ (1.79 and ‘capital gain’ (1.52). For survey results see Table .2

Table 2: Response of Low Income Group

	Status	Score	Fully Aware	Partially Aware	Unaware	Chi-square
Professional Tax	Private	2.56	79 (66)	29 (24)	12 (10)	13.768 ^S
	Public	2.79	95 (79)	25 (21)	0 (0)	
Interest on Housing Loan	Private	2.40	67 (56)	34 (28)	19 (16)	0.493 ^{NS}
	Public	2.38	63 (53)	39 (33)	18 (15)	
Capital Gain arising from the transfer of Property used for residence	Private	2.02	38 (32)	46 (38)	36 (30)	26.099 ^S
	Public	1.52	17 (14)	28 (23)	75 (63)	
Insurance Premium	Private	2.71	85 (71)	35 (29)	0 (0)	25.909 ^S
	Public	2.78	102 (85)	9 (8)	9 (8)	
Contribution to Provident Fund / Public Provident Fund	Private	2.81	97 (81)	23 (19)	0 (0)	6.277 ^S
	Public	2.78	99 (83)	16 (13)	5 (4)	
Investment in National Savings Certificate and Post Office Time Deposit A/c.	Private	2.32	62 (52)	34 (28)	24 (20)	1.934 ^{NS}
	Public	2.43	68 (57)	36 (30)	16 (13)	
Subscription to Mutual Fund	Private	2.07	39 (33)	50 (42)	31 (26)	6.385 ^S
	Public	1.82	25 (21)	48 (40)	47 (39)	
Repayment of Housing Loan	Private	2.15	43 (36)	52 (43)	25 (21)	14.110 ^S
	Public	2.16	57 (48)	25 (21)	38 (32)	
Fixed Deposits in Scheduled Banks / Housing Fin. Corp. for not less than 5 Years	Private	2.23	39 (33)	69 (58)	12 (10)	23.008 ^S
	Public	1.98	38 (32)	41 (34)	41 (34)	
Contribution to Pension Fund	Private	2.33	57 (48)	46 (38)	17 (14)	16.137 ^S
	Public	2.00	44 (37)	32 (27)	44 (37)	
Deduction in Respect of Medical Insurance Policy	Private	2.47	74 (62)	28 (23)	18 (15)	7.626 ^S
	Public	2.18	54 (45)	34 (28)	32 (27)	
Treatment of Handicapped Dependents	Private	1.93	38 (32)	35 (29)	47 (39)	3.369 ^{NS}
	Public	1.79	35 (29)	25 (21)	60 (50)	
Interest on Loan taken for Higher Education	Private	2.01	38 (32)	45 (38)	37 (31)	2.687 ^{NS}
	Public	1.91	37 (31)	35 (29)	48 (40)	
Donation to Charitable Fund	Private	2.10	49 (41)	34 (28)	37 (31)	0.511 ^{NS}
	Public	2.11	47 (39)	39 (33)	34 (28)	
Relief in respect of Arrear Salary / Advance	Private	1.68	15 (13)	52 (43)	53 (44)	17.215 ^S
	Public	2.08	40 (33)	49 (41)	31 (26)	

Source: Survey Data

S → Significant & NS → Not Significant



It was observed that in the private sector, there was high level of awareness on ‘contribution to PF’ (2.81) followed by ‘insurance premium’ (2.71) and ‘professional tax’ (2.56). In the public sector employees showed more awareness on ‘professional tax’ (2.79) followed by ‘contribution to PF’ (2.78) and ‘insurance premium’ (2.78). Thus in either sector the maximum level of awareness was on ‘professional tax’, ‘contribution to PF’ and ‘insurance premium’.

4.2 Response of Lower Middle Income Group

Analysing the level of awareness of the lower middle income group, it was observed that in the private sector there was high level of awareness on ‘insurance premium’ (2.69), ‘contribution to PF/PPF’ (2.63), ‘interest on housing loan’ (2.62), ‘repayment of housing loan’ (2.53) and ‘professional tax’ (2.51). The level of awareness was moderate on ‘fixed deposits’ (2.49), ‘contribution to pension fund’ (2.48), ‘deduction in respect of medical insurance policy’ (2.47), ‘investment in NSC/POTD’ (2.46), ‘subscription to mutual fund’ (2.43), ‘donation to charitable fund’ (2.28), ‘interest on loan for higher education’ (2.20), ‘capital gain’ (2.18), ‘treatment of handicapped dependents’ (2.10) and ‘relief in respect of arrear /advance salary’ (2.04).

In the public sector, the level of awareness was high on ‘contribution to PF’ (2.87), ‘professional tax’ (2.86), ‘insurance premium’ (2.83), ‘investment in NSC and POTD’ (2.71), ‘interest on housing loan’ (2.63), ‘repayment of housing loan’ (2.62) and ‘deduction in respect of medical insurance policy’ (2.51). The level of awareness was moderate on ‘relief in respect of arrear salary /advance salary’ (2.39), ‘donation to charitable fund’ (2.32), ‘contribution to Pension fund’ (2.24), ‘fixed deposits in scheduled banks’ (2.18), ‘interest on loan taken for higher education’ (2.13), ‘treatment of

handicapped dependents' (2.02) and 'subscription to mutual fund' (2.01). The level of awareness was low on 'capital gain' (1.72).

Table 3: Response of Lower Middle Income Group

	Status	Score	Fully Aware	Partially Aware	Unaware	Chi – square
Professional Tax	Private	2.51	48 (53)	40 (44)	2 (2)	23.966 ^S
	Public	2.86	78 (87)	11 (12)	1 (1)	
Interest on Housing Loan	Private	2.62	60 (67)	26 (29)	4 (4)	7.291 ^S
	Public	2.63	67 (74)	13 (14)	10 (11)	
Capital Gain arising from the transfer of Property used for residence	Private	2.18	35 (39)	36 (40)	19 (21)	15.947 ^S
	Public	1.72	19 (21)	27 (30)	44 (49)	
Insurance Premium	Private	2.69	65 (72)	22 (24)	3 (3)	9.263 ^S
	Public	2.83	79 (88)	7 (8)	4 (4)	
Contribution to Provident Fund / Public Provident Fund	Private	2.63	59 (66)	29 (32)	2 (2)	12.488 ^S
	Public	2.87	79 (88)	10 (11)	1 (1)	
Investments in National Savings Certificates and Post Office Time Deposits.	Private	2.46	51 (57)	29 (32)	10 (11)	9.216 ^S
	Public	2.71	70 (78)	14 (16)	6 (7)	
Subscription to Mutual Fund	Private	2.43	45 (50)	39 (43)	6 (7)	19.029 ^S
	Public	2.01	30 (33)	31 (34)	29 (32)	
Repayment of Housing Loan	Private	2.53	52 (58)	34 (38)	4 (4)	19.224 ^S
Fixed Deposits in Scheduled Banks / Housing Fin. Corp. for not less than 5 Years	Private	2.49	49 (54)	36 (40)	5 (6)	13.708 ^S
	Public	2.18	39 (43)	28 (31)	23 (26)	
Contribution to Pension Fund	Private	2.48	51 (57)	31 (34)	8 (9)	6.947 ^S
	Public	2.24	43 (48)	26 (29)	21 (23)	
Deduction in Respect of Medical Insurance Policy	Private	2.47	49 (54)	34 (38)	7 (8)	4.064 ^{NS}
	Public	2.51	57 (63)	22 (24)	11 (12)	
Treatment of Handicapped Dependents	Private	2.10	31 (34)	37 (41)	22 (24)	10.058 ^S
	Public	2.02	37 (41)	18 (20)	35 (39)	
Interest on Loan taken for Higher Education	Private	2.20	33 (37)	42 (47)	15 (17)	18.536 ^S
	Public	2.13	43 (48)	16 (18)	31 (34)	
Donation to Charitable Fund	Private	2.28	41 (46)	33 (37)	16 (18)	5.335 ^{NS}
	Public	2.32	50 (56)	19 (21)	21 (23)	
Relief in respect of Arrear Salary / Advance	Private	2.04	27 (30)	40 (44)	23 (26)	13.228 ^S
	Public	2.39	51 (57)	23 (26)	16 (18)	

Source: Survey Data

S → Significant & NS → Not Significant



It was observed that, in the private sector the maximum level of awareness was on 'insurance premium' (2.69) followed by 'contribution to PF' (2.63) and 'interest on housing loan' (2.62). In the public sector the maximum level of awareness was on 'contribution to PF' (2.87), 'professional tax' (2.86) and 'insurance premium' (2.83).

4.3 Response of Upper Middle Income Group

As far as the upper middle income group was concerned, in the private sector the level of awareness was high on 'contribution to PF/PPF' (2.85), 'interest on housing loan' (2.82), 'insurance premium' (2.82), 'repayment of housing loan' (2.77), 'investment in NSC and POTD' (2.68), and 'deduction in respect of medical insurance policy' (2.60). The level of awareness was moderate on 'subscription to mutual fund' (2.48), contribution to pension fund' (2.45), 'professional tax' (2.40), 'fixed deposits in scheduled banks' (2.40), 'donation to charitable fund' (2.27) and 'interest on loan taken for higher education' (2.18). There was low level of awareness on 'capital gain' (1.98), 'treatment of handicapped dependents' (1.85) and 'relief in respect of arrear/advance salary' (1.68).

In the public sector the level of awareness was high on 'professional tax' (2.97), 'insurance premium' (2.95), 'contribution to PF/PPF' (2.92), 'investment in NSC and POTD' (2.92), 'interest on housing loan' (2.87), 'repayment of housing loan' (2.87), 'deduction in respect of medical insurance policy' (2.82), 'contribution to pension fund' (2.77), 'subscription to mutual fund' (2.72), 'donation to charitable fund' (2.60), 'fixed deposits in scheduled banks' (2.58) and 'interest on loan taken for higher education' (2.52). The level of awareness was moderate on 'relief in respect of arrear/advance salary' (2.43), 'treatment of handicapped dependents' (2.35) and 'capital gain' (2.22). Survey results are presented in Table.4

Table 4: Response of Upper middle Income Group

	Status	Score	Fully Aware	Partially Aware	Unaware	Chi – square
Professional Tax	Private	2.40	37 (62)	10 (17)	13 (22)	22.975 ^s
	Public	2.97	58 (97)	2 (3)	0 (0)	
Interest on Housing Loan	Private	2.82	51 (85)	7 (12)	2 (3)	2.076 ^{NS}
	Public	2.87	52 (87)	8 (13)	0 (0)	
Capital Gain arising from the transfer of Property used for residence	Private	1.98	22 (37)	15 (25)	23 (38)	2.217 ^{NS}
	Public	2.22	29 (48)	15 (25)	16 (27)	
Insurance Premium	Private	2.82	51 (85)	7 (12)	2 (3)	5.283 ^{NS}
	Public	2.95	58 (97)	1 (2)	1 (2)	
Contribution to Provident Fund / Public Provident Fund	Private	2.85	53 (88)	5 (8)	2 (3)	2.812 ^{NS}
	Public	2.92	57 (95)	1 (2)	2 (3)	
Investments in National Savings Certificates and Post Office Time Deposits	Private	2.68	46 (77)	9 (15)	5 (8)	6.945 ^s
	Public	2.92	55 (92)	5 (8)	0 (0)	
Subscription to Mutual Fund	Private	2.48	36 (60)	17 (28)	7 (12)	4.311 ^{NS}
	Public	2.72	45 (75)	13 (22)	2 (3)	
Repayment of Housing Loan	Private	2.77	48 (80)	10 (17)	2 (3)	2.382 ^{NS}
	Public	2.87	52 (87)	8 (13)	0 (0)	
Fixed Deposits in Scheduled Banks / Housing Fin. Corp. for not less than 5 Years	Private	2.40	30 (50)	24 (40)	6 (10)	2.769 ^{NS}
	Public	2.58	39 (65)	17 (28)	4 (7)	
Contribution to Pension Fund	Private	2.45	40 (67)	7 (12)	13 (22)	7.227 ^s
	Public	2.77	49 (82)	8 (13)	3 (5)	
Deduction in Respect of Medical Insurance Policy	Private	2.60	39 (65)	18 (30)	3 (5)	6.640 ^s
	Public	2.82	51 (85)	7 (12)	2 (3)	
Treatment of Handicapped Dependents	Private	1.85	21 (35)	9 (15)	30 (50)	13.549 ^s
	Public	2.35	32 (53)	17 (28)	11 (18)	
Interest on Loan taken for Higher Education	Private	2.18	34 (57)	3 (5)	23 (38)	8.775 ^s
	Public	2.52	41 (68)	9 (15)	10 (17)	
Donation to Charitable Fund	Private	2.27	29 (48)	18 (30)	13 (22)	6.159 ^s
	Public	2.60	42 (70)	12 (20)	6 (10)	
Relief in respect of Arrear Salary / Advance	Private	1.68	17 (28)	7 (12)	36 (60)	25.953 ^s
	Public	2.43	35 (58)	16 (27)	9 (15)	

Source: Survey Data

S → Significant & NS → Not Significant

In the private sector maximum level of awareness was for ‘contribution to PF’ (2.85) followed by ‘interest on housing loan’ (2.82) and ‘insurance premium’ (2.82). In the public sector maximum level of awareness was for



‘professional tax’ (2.97) followed by ‘insurance’ (2.95), ‘contribution to PF’ (2.92) and ‘investment in NSC and POTD’ (2.92)

4.4 Response of High Income Group

Analysing the response of high income group, it was revealed that with regard to the private sector, there was high level of awareness for interest on housing loan (2.93), professional tax (2.90), ‘repayment of housing loan’ (2.83), ‘contribution to PF’ (2.83), ‘insurance premium’ (2.73), ‘contribution to pension fund’ (2.63), ‘investment in NSC and POTD’ (2.57) and ‘deduction in respect of medical insurance policy’ (2.50). The awareness level was moderate for ‘fixed deposits in scheduled banks’ (2.47), ‘capital gain’ (2.40), ‘subscription to mutual fund’ (2.23) and ‘donation to charitable fund’ (2.0). The level of awareness was low for ‘treatment of handicapped dependents’ (1.90) and ‘interest on loan taken for higher education’ (1.73) and ‘relief in respect of arrear salary/advance salary’ (1.43).

In the public sector there was high level of awareness for ‘insurance premium’ (3.0), ‘contribution to PF’ (2.90), ‘investment in NSC and POTD’ (2.80), ‘professional tax’ (2.80), ‘interest on housing loan’ (2.70), ‘repayment of housing loan’ (2.70), ‘deduction in respect of medical insurance policy’ (2.60), ‘contribution to pension fund’ (2.50) and ‘donation to charitable fund’ (2.50). The level of awareness was moderate on ‘fixed deposits in scheduled banks’ (2.40), ‘treatment of handicapped dependents’ (2.20), ‘interest on loan taken for higher education’ (2.20), ‘subscription to mutual fund’ (2.20) and ‘relief in respect of arrear salary/advance salary’ (2.10). The level of awareness was low for ‘capital gain’ (1.70) alone

Table 5: Response of High Income Group

	Status	Score	Fully Aware	Partially Aware	Unaware	Chi – square
Professional Tax	Private	2.90	27 (90)	3 (10)	0 (0)	6.000 ^S
	Public	2.80	27 (90)	0 (0)	3 (10)	
Interest on Housing Loan	Private	2.93	28 (93)	2 (7)	0 (0)	5.455 ^S
	Public	2.70	21 (70)	9 (30)	0 (0)	
Capital Gain arising from the transfer of Property used for residence	Private	2.40	12 (40)	18 (60)	0 (0)	21.231 ^S
	Public	1.70	0 (0)	21 (70)	9 (30)	
Insurance Premium	Private	2.73	22 (73)	8 (27)	0 (0)	9.231 ^S
	Public	3.00	30 (100)	0 (0)	0 (0)	
Contribution to Provident Fund / Public Provident Fund	Private	2.83	25 (83)	5 (17)	0 (0)	0.577 ^{NS}
	Public	2.90	27 (90)	3 (10)	0 (0)	
Investments in National Savings Certificates and Post Office Time Deposits	Private	2.57	17 (57)	13 (43)	0 (0)	3.774 ^{NS}
	Public	2.80	24 (80)	6 (20)	0 (0)	
Subscription to Mutual Fund	Private	2.23	9 (30)	19 (63)	2 (7)	4.009 ^{NS}
	Public	2.20	12 (40)	12 (40)	6 (20)	
Repayment of Housing Loan	Private	2.83	25 (83)	5 (17)	0 (0)	1.491 ^{NS}
	Public	2.70	21 (70)	9 (30)	0 (0)	
Fixed Deposits in Scheduled Banks / Housing Fin. Corp. for not less than 5 Years	Private	2.47	14 (47)	16 (53)	0 (0)	3.606 ^{NS}
	Public	2.40	15 (50)	12 (40)	3 (10)	
Contribution to Pension Fund	Private	2.63	19 (63)	11 (37)	0 (0)	3.227 ^{NS}
	Public	2.50	18 (60)	9 (30)	3 (10)	
Deduction in Respect of Medical Insurance Policy	Private	2.50	15 (50)	15 (50)	0 (0)	7.857 ^S
	Public	2.60	21 (70)	6 (20)	3 (10)	
Treatment of Handicapped Dependents	Private	1.90	5 (17)	17 (57)	8 (27)	10.320 ^S
	Public	2.20	15 (50)	6 (20)	9 (30)	
Interest on Loan taken for Higher Education	Private	1.73	5 (17)	12 (40)	13 (43)	5.461 ^{NS}
	Public	2.20	12 (40)	12 (40)	6 (20)	
Donation to Charitable Fund	Private	2.00	9 (30)	12 (40)	9 (30)	6.429 ^S
	Public	2.50	18 (60)	9 (30)	3 (10)	
Relief in respect of Arrear Salary / Advance	Private	1.43	2 (7)	9 (30)	19 (63)	12.715 ^S
	Public	2.10	9 (30)	15 (50)	6 (20)	

Source: Survey Data

S → Significant & NS → Not Significant



It was observed that, in the private sector maximum level of awareness was for ‘interest on housing loan’ (2.93) followed by ‘professional tax’ (2.90), ‘contribution to PF’ (2.83) and ‘repayment of housing loan’ (2.83). In the public sector maximum level of awareness was for ‘insurance premium’ (3.0). It was followed by ‘contribution to PF’ (2.90), ‘professional tax’ (2.80) and ‘investment in NSC and POTD’ (2.80).

The factors that exhibited high level of awareness on various deductions available under the Income Tax Act showed the following results in Table.6

Table 6: Factors with Maximum Awareness

Income Level	Private Sector			Public Sector		
	1	2	3	1	2	3
Low Income Group	PF ¹	Insurance ²	Prof. Tax ³	Prof. Tax	PF	Insurance
Lower Middle Income Group	Insurance	PF	Int. on ⁴ H.L.	PF	Prof. Tax	Insurance
Upper Middle Income Group	PF	Int. on H.L.	Insurance	Prof. Tax	Insurance	PF & NSC
High Income Group	Int. on H.L	Prof. Tax	Repay. of H.L. ⁵	Insurance	Prof. Tax	Invst. In NSC ⁶

Note: ¹Contribution to Provident Fund; ² Insurance Premium; ³ Professional Tax; ⁴ Interest on Lousing Loan; ⁵ Repayment of Housing Loan; ⁶ Investment in National Savings Certificate and Post Office Time Deposits.

It was observed that in either sector maximum awareness existed for ‘PF’, ‘Insurance’, ‘Professional Tax’ and ‘Housing Loan’. In the private sector ‘PF’ showed the highest level of awareness among the Low Income Group and Upper Middle Income Group. ‘Insurance’ came first for the Lower Middle Income Group while ‘Housing Loan’ secured first among the High Income Group.

In the public sector, ‘Professional Tax’ came first among the Low Income Group and Upper Middle Income Group. ‘PF’ occupied the first among Lower middle Income Group while ‘Insurance’ came first for the High Income Group. Table.7 represents the factors with minimum awareness.

Table 7: Factors with Minimum Awareness

Income Level	Private Sector			Public Sector		
	1	2	3	1	2	3
Low Income Group	² Relief u/s 89	³ Treat. of Hand. Dependent	⁶ Int. on loan for high. Edu.	⁴ Capital gain	Treat. of Han. Dependents	⁵ Mutual Fund
Lower Middle Income Group	Relief u/s 89	Treat. of Hand. Dependent	Capital gain	Capital gain	Mutual Fund	Treat. of Hand. Dependent
Upper Middle Income Group	Relief u/s 89	Treat. of Hand. Dependent	Capital gain	Capital gain	Treat. of Hand. Dependents	¹ Fixed Deposits
High Income Group	Relief u/s 89	Int. on loan for high. Edu.	Treat. of Hand. Dependents	Capital gain	Relief u/s 89	Capital Gain, Int. on Loan and Subscription to Mutual Fund

Source: Data Analysis

Notes: ¹Fixed Deposits in Banks; ² Relief u/s 89 in respect of arrear salary/advance salary; ³ Treatment of handicapped dependents; ⁴ Capital Gain arising from the transfer of property used for residence; ⁵ Subscription to Mutual Fund; ⁶ Interest on loan taken for higher education.

In the private sector ‘Relief u/s 89 in respect of Arrear /Advance Salary’ had the lowest level of awareness among all the four income groups. In the public sector, ‘Capital Gain’ had the lowest level of awareness for all the income groups. The other factors on which there was low level of awareness were ‘Treatment of Handicapped Dependents’, ‘Interest on Loan for Higher Education’ and ‘Subscription to Mutual Funds’.

Hypothesis Testing:

The hypothesis for testing was:

There is no significant difference between the employees of the private sector and the public sector with regard to their level of awareness about deductions available under the Income Tax Act.



Applying Chi-square analysis, it was revealed that, under the low income group there was no significant difference between the employees of the private sector and the public sector with regard to their level of awareness about 'interest on housing loan', 'investment in NSC and POTD', 'treatment of handicapped dependents', 'interest on loan taken for higher education' and 'donation to charitable fund'. The hypothesis stands accepted at 5 per cent level of significance on the above factors. Significant difference existed with regard to 'professional tax', 'capital gain', 'insurance premium', 'contribution to PF', 'subscription to mutual fund', 'repayment of housing loan', 'fixed deposits', 'contribution to pension fund', 'deduction in respect of medical insurance policy' and 'relief in respect of arrear salary/advance salary'. The hypothesis stands rejected at 5 per cent level of significance on the above factors.

Under lower middle income group, it was revealed that there was no significant difference between the employees of the private sector and the public sector with regard to their level of awareness about 'deduction in respect of medical insurance policy' and 'donation to charitable fund'. The hypothesis stands accepted at 5 per cent level of significance. Regarding 'professional tax', 'interest on housing loan', 'capital gain', 'insurance premium', 'contribution to PF/PPF', 'investment in NSC/POTD', 'subscription to mutual fund', 'repayment of housing loan', 'fixed deposits in scheduled banks', 'contribution to pension fund', 'treatment of handicapped dependents', 'interest on loan for higher education' and 'relief in respect of arrear /advance salary', there existed significant difference and thus the hypothesis stands rejected at 5 per cent level of significance on these factors.

Under the upper middle income group, statistically there was no significant difference between the employees of the private sector and the

public sector with regard to their level of awareness about 'interest on housing loan', 'capital gain', 'insurance premium', 'contribution to PF', 'subscription to mutual fund', 'repayment of housing loan' and 'fixed deposits in scheduled banks'. Thus the hypothesis stands accepted at 5 per cent level of significance on the above factors. Significant difference existed with regard to 'professional tax', 'investment in NSC and POTD', 'contribution to pension fund', 'deduction in respect of medical insurance policy', 'treatment of handicapped dependents', 'interest on loan taken for higher education', 'donation to charitable fund' and 'relief in respect of arrear/advance salary'. The hypothesis stands rejected at 5 per cent level of significance.

Among the high income group, there was no significant difference between the employees of the private sector and the public sector with regard to their level of awareness about 'contribution to PF', 'investment in NSC and POTD', 'subscription to mutual fund', 'repayment of housing loan', 'fixed deposits in scheduled banks', 'contribution to pension fund' and 'interest on loan taken for higher education'. The hypothesis stands accepted at 5 per cent level of significance on the above factors. Regarding 'professional tax', 'interest on housing loan', 'capital gain', 'insurance premium', 'deduction in respect of medical insurance policy', 'treatment of handicapped dependents', 'donation to charitable fund' and 'relief in respect of arrear/advance salary', there existed significant difference and thus the hypothesis stands rejected at 5 per cent level of significance on these factors.

5. Conclusion

From the above observations it was revealed that employees exhibited high level of awareness on most of the factors considered for study but with differences across categories. The awareness level was high on professional



tax, housing loan and deductions under section 80C relating to contractual savings. They showed low level of awareness for relief u/s 89, capital gains, treatment of handicapped dependents etc.

Thus it was inferred that employees depicted more awareness on the compulsory and statutory deductions (PF, professional tax), contractual savings (life insurance premium) and deductions relating to housing loan. But their awareness was low on those deductions which are not very commonly used like capital gains, relief u/s 89, treatment of handicapped dependents etc. It means that salaried assesseees still lack in depth knowledge in various tax planning measures available under the Act.

References

- Acharya Suklendra and M.G Gurha, Tax Planning under Direct Taxes, Modern Publishers, Lucknow, 2001.
- Mehrothra.H.C & Goyal S.P, Income Tax Law and Practice, Sahythyabhavan Publications, 2014.
- Tax Planning for Salaried Employees , Scientific Publishers, Jodhpur, 1985.
- Rajaratnam and Venkataramaiah B.V, Tax Planning Issues, Ideas and Innovations, Bharat Law Publications, Jaipur, 2007.
- Raghu.R.Palat, Introduction to Tax Planning for the Salaried Employees, Jaico, Bombay, 1993.

FLIPKART – MYNTRA MERGER - AN ANALYSIS

Ubais P.I., Mathew Abraham, Telsa Tom
Marian College, Kuttikkanam

Abstract

Indian E-tail industry is remaining as an unexplored industry with lots of opportunities before the national and international players. This article is about the nation's leading e-tail giant flipkart and its merger cum acquisition deal with another player Myntra. It's all about expanding the market share and achieving greater economies of scale. The study tried to understand the possible opportunities that prompted the flipkart management to acquire myntra.

“We want to be leader in every category that we are present in. Fashion is definitely the category of the future and we want to be the biggest players in this space.”

Sachin Bansal

Introduction

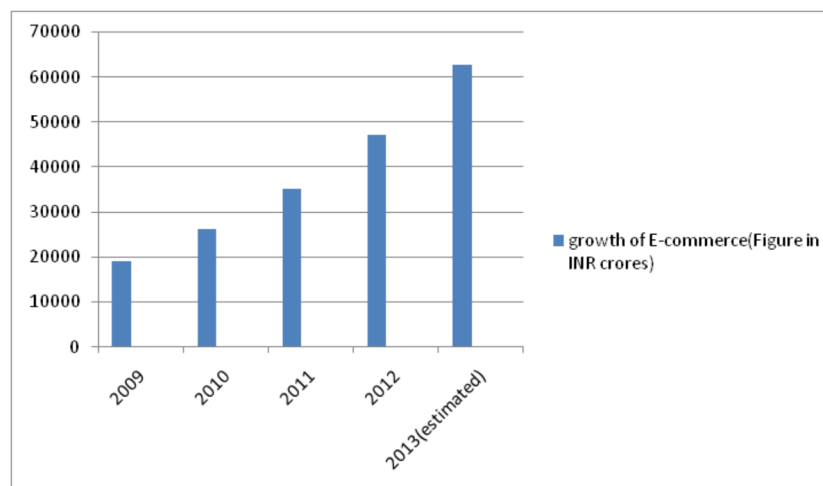
Indian E-tail industry is a less explored market with high growth potential. According to a report prepared jointly by KPMG and Internet and Mobile association of India, Indian E-tail industry was worth Rs.7500 crore during 2013. E- tail sector in India constitutes only 7.9% of its organized retail sector and 0.55% of the overall Indian retail industry. Even though there are number of E-tail companies in India, still there are areas to be discovered. However, the competition among the existing firms were stiffer than any other industries in India and also the number of mergers and acquisitions were high in the E-tail sector. The following are the major E-tail players in India;

- Flipkart-Myntra (Multi- Product Category)
- Snapdeal (Multi- Product Category)



- Amazon (Multi- Product Category)
- Ebay (Multi- Product Category)
- Jabong (Fashion, Lifestyle)
- Fashion and you (Fashion, Lifestyle)
- Inkfruit (Fashion, Lifestyle)
- Yebhi (Fashion, Lifestyle)
- Caratlane (Jewellery)
- Pepperfry (Furniture)
- Urbanladder (Furniture)
- Baby oye (Baby Products)
- First cry (Baby Products)

According to Report of Digital Commerce, IAMAI-IMRB (2013), e-commerce is growing at the CAGR of 34% and is expected to touch US\$ 13 billion by the end of 2013. However, travel segment constitutes nearly 71% of the transactions of consumer e-commerce industry, meaning thereby that e-tailing has not taken off in India in any meaningful way. Share of e-tail has grown at the rate of 10% in 2011 to 16% in 2012.

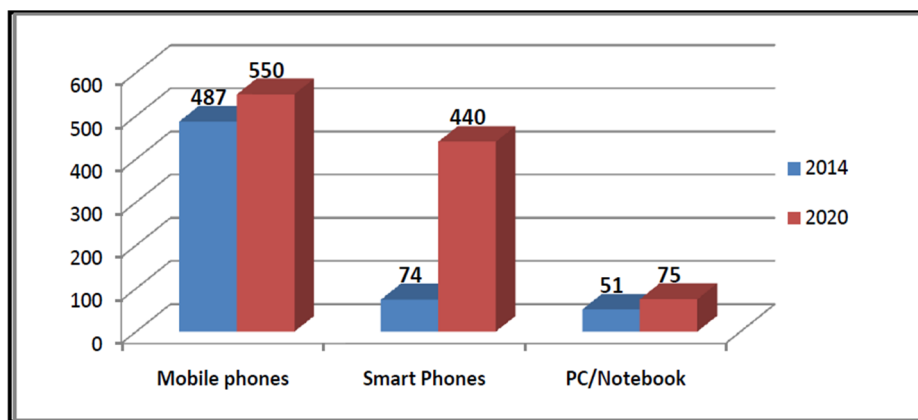


Source: Tactful Management Research Journal ISSN: 2319-7943

Figure 1: Graph showing growth of E-commerce in India

Road ahead

Indian E-tail industry shows greater potential for growth especially in the coming 5 years. With the increase in the number of users of Smart phones and pc's/note books, Many of the researchers estimate a tremendous increase in the internet users in the coming years that shows the growth potential of the industry.



Source: International Journal of Management and International Business Studies ISSN 2277-3177

Figure 2. Showing growth in the number of users of smart phones PC's and Notebook

About the Leaders – Flipkart & Myntra

Flipkart often termed as “Indian Amazon” is the largest e-tail company in India in terms of trade volume. It is the success saga of two IITian's, Sachin Bansal and Binny Bansal ex- employees of “Amazon Ltd.”, they created Flipkart.com in the year 2007 with an initial investments of Rs.4 lakhs. Primarily the focus was on books, and later evolved to a multi- category virtual store with multi product categories. It employs more than 4500 individuals and is headquartered in Bangalore.



Facts about Flipkart:

- Flipkart's website is one of the top 10 Indian websites.
- Flipkart has launched its own product range under the name "*DigiFlip*", offering camera bags, pen-drives, headphones, computer accessories, etc.
- The first product sold was the book *Leaving Microsoft To Change The World*, bought by VVK Chandra from Andhra Pradesh. 9
- In November 2012, Flipkart became one of the companies being probed for alleged violations of FDI regulations of the Foreign Exchange Management Act, 1999.
- On average, Flipkart sells nearly 20 products per minute. 10

Flipkart is the E-tail leader, who uses the mergers and acquisition strategy widely to sustain its leadership in the market, before acquiring Myntra in 2014 it acquired several small players;

- 2010: WeRead, a social book discovery tool
- 2011: Mime360, a digital content platform company
- 2011: Chakpak.com, a Bollywood news site that offers updates, news, photos and videos. Flipkart acquired the rights to Chakpak's digital catalogue which includes 40,000 filmographies, 11 10,000 movies and close to 50,000 ratings. Flipkart is not be involved with the original site and does not use the brand name.
- 2012: Letsbuy.com, an Indian e-retailer in electronics. 12 Flipkart has bought the company for an estimated US\$25 million. Letsbuy.com was closed down and all traffic to Letsbuy have been diverted to Flipkart.
- 2014: Acquired Myntra.com Marking the biggest consolidation in the e-commerce space in India, homegrown e-retailer Flipkart acquired online fashion retailer Myntra in an estimated Rs 2,000 crore deal.

Myntra – the online fashion hub

Myntra offers an online fashion world to its millions of users with customization options. Myntra.com is founded by Mukesh Bansal and Ashuthosh Lawania in February 2007, later on Mr. Saxena and Mr. Sastry joined the company as co-owners. All of the four were invested Rs.5 million in the company. At present the company is reporting 20% growth rate annually and offers nearly 70000 products of 700 leading national and international designer brands. Myntra is an e-tailer that follows inventory based model in India. It ships 20000 items per day across 400 cities with an average order of Rs.1600.

Facts about Myntra before Merger;

- Myntra moved from offering personalised products to fashion and lifestyle retailing by the last quarter of 2010
- Myntra received a total of \$75 million investment by 2013 over multiple rounds
- Major investors: Accel Partners, Tiger Global, Kalaari Capital and IDG Ventures
- Run rate of \$100 million a year, growing at 20% year-on-year²⁴
- Gets 12,000 orders that roughly translate into shipping 20,000 items daily across 400 cities with an average order of Rs 1,600.
- Competes with Flipkart, Jabong, Fashion and you, etc.
- Myntra.com was announced as a winner of the Red Herring Global 100 award.
- CNBC - TV18 awarded Myntra.com as one of the Hottest Internet Companies of the Year (2012) at the Mercedes - Benz CNBC - TV18 Young Turks Awards.
- Myntra.com won IAMAI's Best Ecommerce Website of the year award for 2012 at the 7th India Digital Summit, 2013.



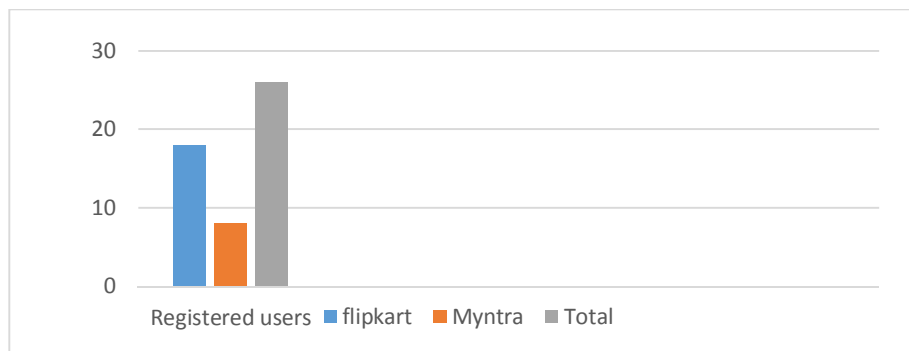
Largest Consolidation ever in the history of Indian E- tail Industry

It was a Dollar 300 million deal and largest ever in the history of Indian E-tail industry. Flipkart is a leader in selling multiple product categories online and Myntra is India's leading fashion retailer with strong brand recall. Their combined might also places them in a better position to take on the likes of Amazon, which has become increasingly aggressive in India's booming e-tailing market. Flipkart is into a number of categories, Myntra is focused on fashion e-tailing. With Myntra's share of 30% of online fashion sales, Flipkart now has a 50% share in a segment that's clocking nearly 100% annualized growth. With this deal, Flipkart effectively has stolen the thunder from Gurgaon-based Snapdeal, which was looking to be the first e-tailer in India to cross Rs 1,000 crore in fashion sales by the end of this year. As part of the acquisition, Myntra co-founder Mukesh Bansal will join Flipkart's board and will also oversee Flipkart's fashion business. Flipkart and Myntra will remain as two separate entities, but people holding stock options in Myntra will now hold the same in Flipkart. The current deal appears to be win-win for both companies, and could be the making of a giant company, better positioned to address India's growing demand for online retail - one that could put up strong competition against rivals.

The goal of Myntra is to achieve a gross sale of Rs. 20000 crore for that it needs 150- 200 million funds by this deal flipkart will invest Rs. 100 million fresh funds in the firm. In short it is a multi-crore deal focused with mutual benefits of both the parties. The synergy effect of this deal made it a super good deal in the Indian E-tail industry.

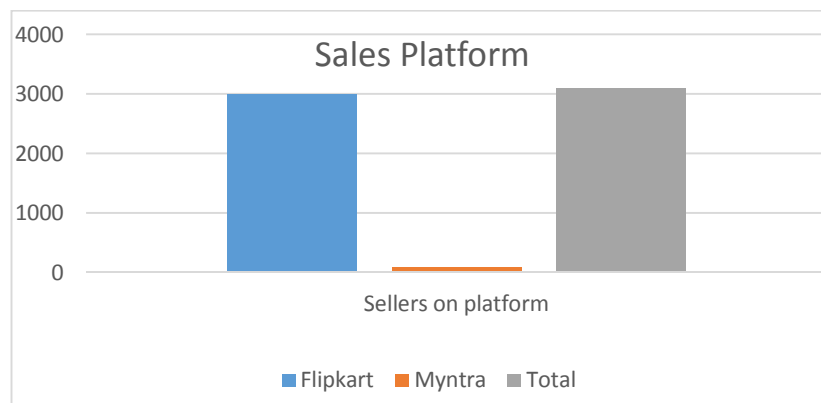
Table1: An Analysis of the Synergy Effect

	Flipkart	Myntra	Total
Registered Users	18m	8m	26m
Daily visits	3.5m	1.7m	5.2m
Sellers on platform	3000	100	3100
Team strength	10,000	2000	12000

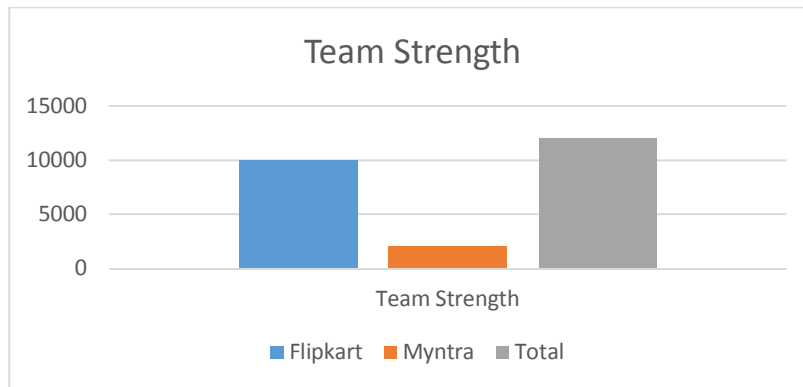


Source: articles.economictimes.indiatimes.com/2014-04-14

Graph 3: Graph showing registered users of flipkart and Myntra jointly and severally



Graph 4: Graph showing Sellers on the platform of both Myntra and flipkart



Graph 5: Graph Showing Team strength of flipkart and myntra

From the above table and graphs it is very clear that the merger will help the company to attain a synergy effect in its all operations. The registered users of the companies reached 26 million and the number of sellers on the platform touched 3100 after the merger.

Conclusion

Mergers and acquisitions are important tools to limit competition and to increase the market power. Flipkart and Myntra are firms that used the strategy widely even before their merger, through this merger both the companies will get mutually benefited on several grounds, most importantly the market share and competition. More than a merger it can be viewed as a strategic alliance, as even after the merger both the companies decided to work separately. Flipkart-Myntra together enjoys around 26 million of registered users and 5.2 millions of daily visits at present. Both the companies reported an individual growth rate of 30% and more, which shows the synergy effect expected by both the companies. Hence, we can safely conclude the M&A had always been and will be the most commonly used growth strategy in future as well.

References

- fatima, F. (2015). from a merger to an acquisition. *International journal of management and international business studies*.
- Malik, D. R. (2014). study of mergers & acquisitions‘ growth strategy in e-tailing industry . *International Journal of management research and social science* .
- Verma, p. k. (2014). merger and acquisition in e commerce sector . *tactful management research journal*.



ROLE OF MSME IN WOMEN ENTREPRENEURIAL DEVELOPMENT

Ajay Joseph*, Tintu Mariam Philip, Anjaly Balakrishnan**

* Post Graduate Department of Commerce and Research Centre, Bharata Mata College, Thrikkakara

** Department of Commerce, Christ Nagar College Maranalloor, Trivandrum

Abstract

Promotion of Women Entrepreneurship is a vital issue for several countries including India. Micro, Small and Medium Enterprises (MSMEs) play a vital role in the development of Women entrepreneurs. This paper focus on the role played by MSMEs in encouraging and developing women as entrepreneurs. MSMEs aims to enhance competitiveness, technology improvement, adoption of best manufacturing practices, marketing of products, employment generation for building women entrepreneur. The study throws lights to the problems faced by the women and how MSMEs helps them to overcome those problems. Sample sizes of 50 respondents were selected for the study. The findings of the study shows that increased participation of MSMEs help to women entrepreneur to overcome the problems faced by them.

Key words: Women Entrepreneurial Development, Micro Small and Medium Scale Enterprises, Problems of Women Entrepreneurs.

Introduction

The micro, small and medium scale enterprises (MSMEs) have been generally acknowledged as the bedrock of the industrial development of any country. The micro, small and medium enterprises (MSMEs) sector in India has a very pivotal role to play in the development of the country. In India, MSMEs are the second largest source of employment after agriculture. They account for almost 40 per cent of industrial production, 95 per cent of the

industrial units, 34 percent of the exports and manufacture over 6000 products. This sector produces a mélange of industrial **products** such as food products, beverage, tobacco and goods produced from it, cotton textiles and wool, silk, synthetic products, jute and jute products, wood and wood products, furniture and fixtures, paper and goods produced from it. Other services also include machinery, apparatus, appliances and electrical machinery. This sector also has a large number of growing service industries.

Women Entrepreneurs: Current Scenario

Entrepreneurship amongst women has been a recent concern. Women Entrepreneurs may be defined as the woman or a group of women who initiate, organize and operate a business enterprise. Government of India has defined women entrepreneurs as an enterprise owned and controlled by a women having a minimum financial interest of 51% of the capital and giving at least 51% of employment generated in the enterprise to women. Like a male entrepreneurs a women entrepreneur has many functions. They should explore the prospects of starting new enterprise; undertake risks, introduction of new innovations, coordination administration and control of business and providing effective leadership in all aspects of business.

Categories of Women Entrepreneurs

There are three categories of women entrepreneurs, i.e. “chance”, “forced” and “created” entrepreneur. These different categories are based on how their businesses got started, or what are their main reasons or motivations to open their own businesses.

- Chance entrepreneurs are those who start a business without any clear goals or plans. Their businesses probably evolved from hobbies to economic enterprises over time.



- Forced entrepreneurs are those who were compelled by circumstances (e.g., death of a spouse, the family facing financial difficulties) to start a business, their primary motivation, hence, tend to be financial.
- Created entrepreneurs are those who are “located, motivated, encouraged and developed through, for instance, entrepreneurship development programs.

Role of Micro Small Medium Enterprise

In order to develop the women entrepreneur in micro small and medium enterprises (MSME). The government provides several schemes to women entrepreneur such as Trade Related Entrepreneurship Assistance and development scheme for women (TREAD), Micro & Small Enterprises Cluster Development Programme (MSE – CDP), Credit Guarantee Fund Scheme, Entrepreneurship Development Programme (EDPs), Technology Up gradation and Marketing development Export promotion.

Statement of the Problem

Women’s skills, knowledge, their talents and abilities in doing business and a compelling desire of wanting to do something positive and innovative are some of the reasons for the women entrepreneurs to organize industries. According to World Bank, investing more in business of women rather in men leads to greater development of a nation. Entrepreneurship plays an important role in developing society Empowering women in entrepreneurship leads to break the inequalities and reduces the poverty. Emergence of women as entrepreneur has given a new status to their life in the society. At present women are not “jobseekers” but they are “job providers”. The government has realized the importance of women entrepreneurship. Today with the growth of MSME, many women have plunged into entrepreneurship and are also running their

enterprises successfully. With the relevant education, work experience, improved economic condition and financial opportunities more women are venturing into business. Accordingly this study examines the following research questions:

- What are the problems faced by women Entrepreneur in developing a business?
- What is the role played by MSME in women Entrepreneurial Development?

Objectives of the Study

- 1) To identify the problems faced by women entrepreneur
- 2) To Study the role played by MSMEs in women Entrepreneurial Development

Hypothesis

H0: There is no significant relation between the problems faced by women entrepreneurs and role MSMEs in Women Entrepreneur development

H1: There is significant relation between the problems faced by women entrepreneurs and role MSMEs in Women Entrepreneur development

Methodology

The study is based on both primary and secondary data. Secondary data was collected from various sources like magazines, journals, Government reports, periodicals and internet etc. Primary data was collected from sample respondent using a structured interview schedule from 50 Women Entrepreneur in Ernakulum, Trissur district. The respondents were identified through convenient sampling. Responses on the various measures used in the study were obtained on a five point scale as strongly agree (5), agree (4),



neither agree nor disagree (3), disagree (2) and strongly disagree (1). The collected data was analyzed using appropriate mathematical and statistical tools like simple percentages, mean and correlation using SPSS(Statistical Package for Social Sciences) software.

Results and discussions

Most of the respondents come under the age group of 35-45. Marital status shows that most of the respondents come under the category of married women's, marital status is a very important factor to determine the women entrepreneurs. Majority of the respondents are belonging to higher secondary level of the entrepreneur. It has observed that more than half of the respondents are belonging to Rs. 10,000 to Rs. 20,000 incomes of families. Majority of the respondents are engaged in manufacturing types of business than service type of business. Most of them are engaged in small scale business and their investments are below one lakh rupees.

Problems Faced By Women Entrepreneurs

Setting up an enterprise is not an easy job for women entrepreneurs and at the same time running the enterprise is a greater task. A challenge is always there for these women entrepreneurs to run their enterprise successfully earning profit and ensuring the growth of the enterprises which will severely test their entrepreneurial skill and survival of the unit. Despite various odds against them, several women are off to run their own enterprises. Even though there has been a considerable increase in the number of women entering in entrepreneurial activity, they are being introduced to many constraints and difficulties with regard to control and decision making, social status and enthusiasm in the product or service in which they are dealing. It has been found that women are entering more in

this venture as compared to men to start their own business to make social contribution in addition to desire of exploring their inner self and fulfilling their means of livelihood. Following six factors are identified, which affect women entrepreneurs. The problem faced by women entrepreneurs were measured in six variables which are listed in table 1. In order to draw meaning from collected data, the mean scores and standard deviations were calculated. Rating scale adopted here is 5 for “Strongly Agree”, 4 for “Agree”, 3 for “Neutral”, 2 for “Disagree” and 1 for “Strongly Disagree”.

Tables 1: Problems faced by women entrepreneurs:-

Items	Mean	Standard deviations
Access to finance	4.2	.639
Access to training	3.0	.547
Access to market	2.8	.512
Support from families	2.2	.508
Access to networks	3.4	.535
Lack of skills	4.4	.678
Overall	3.3	.569

Source: Primary Data. N=50

From the above table we can say that lack of skills constitute a mean of 4.2 and standard deviation 0.678, means many women entrepreneur lack communication, leadership and decision making skills. Access to finance is above 4 which show that it is very difficult to get funds and credit facilities for them. These are two a major factor that act as an obstacle in women entrepreneur development. From the data it is clear that they are getting a good support from family members in setting up of business. Access to networks and training is average it is below 3.5 and above 2.5 which means they lack access to new information and experience on how to participate in market place and unable to find a good market place for their products. The



overall mean is above 3, which shows the above identified factors act as a barrier for their development.

Role of MSME's in Women Entrepreneurial Development

The micro small and medium enterprises (MSMEs) have been accepted as the engine of economic growth and for promoting equitable development. The major advantage of the sector is its employment potential at low capital cost.

The labor intensity of the MSME sector is much higher than that of the large enterprises. The MSMEs constitute over 90% of total enterprises in most of the economies and are credited with generating the highest rates of employment growth and account for a major share of industrial production and exports. In India too, the MSMEs play a vital role in the overall industrial economy of the country. In recent years the MSME sector has consistently registered higher growth rate compared to the overall industrial sector. With its agility and dynamism, the sector has shown admirable innovativeness and adaptability to survive the recent economic downturn and recession. The role of MSMEs is to enhance competitiveness, technology improvement, adoption of best manufacturing practices, marketing of products, employment generation etc. For the budding women entrepreneur, MSME provides Trade Related Entrepreneurship assistance and development schemes for women (TREAD), Entrepreneurship development Programme (EDP) and other schemes for setting up their own venture, capital investment, educational skills and ability to run the business. MSME is providing Credit linked Capital Subsidy Scheme (CLCSS) for Technology Up gradation. The paper throws light on the available schemes and subsidy of special benefits to women and also creates awareness of these schemes to women entrepreneurs. The Role of MSME's in Women Entrepreneurial

Development were measured in five variables which are listed in table 2. In order to draw meaning from collected data, the mean scores and standard deviations were calculated. Rating scale adopted here is 5 for “Strongly Agree”, 4 for “Agree”, 3 for “Neutral”, 2 for “Disagree” and 1 for “Strongly Disagree”.

Table 2: Role of MSME’s in Women Entrepreneurial Development

Items	Mean	Standard deviation
Skill development programme	4.68	.674
Marketing Assistance and export promotion scheme	3.56	.539
Credit Guarantee fund scheme	4.45	.648
Infrastructural Development	3.88	.545
Training programme	4.15	.611
Overall	4.14	.603

Source: Primary Data. N=50

From the above table we can say the role played by MSMEs in Women Entrepreneur development is very vital. They are concentrating more on skill development programmes like leadership qualities, decision making, idea generation and building more confidence. Credit guarantee fund scheme whose mean is above 4 which proves that the respondents are very much satisfied with the fund providing scheme. MSME provides access to finance and also able to get credit at lower interest rates. They have introduced schemes namely TREAD. Mahila Vikas Nidhi, offers development assistance in pursuit of income generating women activity. SIDBI has taken steps to provide credit and training for credit utilization programmes. Training programmes provided by MSMEs are good as it is clear from the table. Their Role is least in the area of marketing and export promotion scheme. It constitutes only 3.56 of mean.



But Overall mean is above 4 so it is identifiable that the role played by MSMEs in development and empowerment of women as entrepreneur is very crucial.

Correlation Analysis and Hypotheses Testing

Correlation refers to a technique used to measure the relationship between two or more variables. Here we test whether the MSME Role in entrepreneurship development has any significant relation to the problems faced by Women entrepreneurs. Positive correlation means that high score on one are associated with high score on others, and that low scores on are associated with low scores on the other. Negative correlation is vice- versa. Correlation Coefficient is measured to show the extent of relation, it varies from 1 to -1. Table 3 shows the test results

Table 3: Correlation Test

Role of MSME's in entrepreneurship development on problems faced by Women entrepreneurs	Statistics
Pearson Correlation	-0.576**
Sig. (2-tailed) P- Value	.001
N	50

**Significant at 1 percent

Source: Compiled by Researcher

From the above table since P- Value is below 0.01 we **reject the (H_0)** null hypothesis at 1 percent significance level and accept the alternative hypothesis, which means there is significant relation between the problems faced by women entrepreneurs and role MSMEs in Women Entrepreneur development. Correlation Coefficient is -0.576 mean that there exists a negative correlation. Which in general means higher the Role of MSME's in entrepreneurship development lesser will be the problems faced by Women entrepreneurs.

So it can be concluded that MSME's Plays a vital role in development of Women entrepreneurship.

The major findings of the study are summarised here under.

1. Majority of the respondents are above 35 years. More than 60% of them are married and engaged in small scale business.
2. From the study it was found that access to finance and lack of skills are the very serious problems faced by women entrepreneur. Most of women entrepreneurs are getting good support and motivation from their families.
3. The role played by MSMEs is very important in overcoming the barriers faced by the women entrepreneurs. The role of MSMEs is more on skill development and providing credit facilities and gives least focus on marketing and export promotion activities.
4. The Correlation Coefficient is -0.576 mean that there exists a negative correlation; this shows that higher the Role of MSME's in entrepreneurship development lesser will be the problems faced by Women entrepreneurs.

Concluding Remark

Women Entrepreneurship plays a prime role in industrial development. It plays very vital role in fulfilling the socio-economic objectives of the nation. Thus MSME is playing remarkable role in widening the base of industrial entrepreneurship. The contribution of the women entrepreneurs with the help of MSME to our national economy cannot be understood. From the study it is observed that when the role of MSMEs is increasing the barriers faced by women entrepreneur is decreasing. It means that the relationship between the role of MSMEs and problems faced by them women



entrepreneurs are inversely related. Thus, MSME's Plays a vital role in development of Women entrepreneurship.

Reference

- Kurian, S. (October 2012,). Women entrepreneurship in micro, small and medium enterprises (msme) in chennai city. International Journal of Marketing, Financial Services & Management Research , Vol.1 Issue 10, ISSN 2277 3622
- Baporikar, N. (2007) Entrepreneurship Development & Project Management- Himalaya Publication House
- Swapna Kurian (2012) Women Entrepreneurship In Micro, Small And Mediumenterprises (Msme) In Chennai City. International Journal of Marketing, Financial services & Management research Vol.1 Issue 10, October 2012, ISSN 2277 3622
- Dr. AmanDeep Singh(2013)Women Entrepreneurs in Micro, Small and Medium Enterprises. International Journal of Management and Social Sciences Research (IJMSSR) Volume 2,no 8, august 2013
- Roomi, Muhammad Azam and Guy Parrott (2008) 'Barriers to Development and Progression of Women Entrepreneurs, journal of Entrepreneurs 17(1): 59-72
- Tambunan, Tulus T.H., 2008, Development of SMEs in ASEAN, New Delhi: Readworthy Publications, Ltd
- Walokar, Deepak M., 2001, Women Entrepreneurs. New Delhi: Himalaya Publishing House. for Entrepreneurial Leadership, Clearinghouse on Entrepreneurship Education.
- Dhameja, S.K., B.S. Bhatia and J.S. Saini, 2002, 'Problems and constraints of women entrepreneurship', in D.D. Sharma and S.K. Dhameja (eds.), Women and Rural Entrepreneurship, Chandigarh: Abhishek Publication.

**THE IMPACT OF PERFORMANCE MANAGEMENT
SYSTEM ON EMPLOYEE INVOLVEMENT:
AN EMPIRICAL ATTESTATION AMONG SCIENTISTS IN
R&D ORGANIZATIONS**

Tessla Arakal¹, Sebastian Rupert Mampilly²

¹KVM College of Engineering & Information Technology, Cherthala

²School of Management Studies, CUSAT

Abstract

Performance Management as an organizational process that provides for competent management of individuals and teams in order to achieve superior levels of performance holds a noteworthy place in management literature. Performance Management System (PMS) is an elaborate set of interrelated options and activities considered holistically as an integrated and elevated highway in an organization's trajectory towards the cherished destinations by developing and deploying human capital, reinforcing its competencies for achieving sustainable competitive advantage. The attempt in this paper is to outline the impact of performance management system on employee involvement. Employee involvement is taken to be a rumination of the level of participation by members in an organization's decision-making. This study is based on primary data collected from 100 scientists working in a nationalised Research and Development organization in central Kerala. The survey conducted during the first quarter of 2015, is expected to enlighten the readers on the linkage between performance management system as the predictor and employee involvement as the outcome. Findings of the study are reported along with its limitations and suggestions for further research.

1. Introduction

Functional outcomes of performance management are among the avowed benefits of Human Resource Management as performance management as it



can upsurge performance driven behaviours among employees and consequently the results of the organisation (Waal and Medema, 2006). Michael Armstrong and Angela Baron, (2004) opined that performance management is a process that contributes to the effective management of individuals and teams in order to accomplish high levels of organisational performance. Literature recognises ‘performance’ both as behaviour and results. (Brumbarch, 1998). Cones & Jenkins (2002) are of the view that individual performance is mostly resolved by the system in which the work is done rather than by the individual’s initiative, abilities and efforts. Performance management assures that employee activities and outputs contribute to organisational goals (Gomez & Mejia, 1999). In a nut shell, performance management is a means of getting superior results for organisations, teams and individuals by managing performance in consonance with the organisational strategy.

The next idea delineated through this study is that of employee involvement, which implies that every employee is a living being, not just a cog in a machine, involved in aiding an organization meet its goals. Therefore every employee’s input has to be solicited and valued by the management. Employees and management mutually respect and recognize that each employee is involved in running the business (lou, January 2000).

This paper also concentrates on highlighting the dynamics of managing HR in the new global order. Implementation of performance management system precipitates constant surveillance of employees which can lead to self-motivated, self-disciplined work related behaviours among employees, coupled with enthusiasm towards achieving the goals of the organisation and can result in superior and reliable performance. More over employee involvement can edge to empowering the employees leading to organisational growth and success.

2. Literature Review

2.1 Performance Management – Literature Review

Tracing the ancestry of performance management, one may arrive at concepts like merit rating, management by objectives and performance appraisal. W D Scott (1950) was the American pioneer who introduced rating of the abilities of workers in industry prior to the First World War. The term ‘management by objectives’ was first coined by Peter Drucker (1955) as follows: What the business enterprise needs is a principle of management that will give full scope to individual strength and responsibility and at the same time give common direction of vision and effort, establish teamwork and harmonise the goals of the individual with the common weal. The only principle that can do this is management by objectives and self-control. As defined by the Advisory, Conciliation and Arbitration Service (ACAS) in 1988: ‘Appraisals regularly record an assessment of an employee’s performance, potential and development needs. The appraisal is an opportunity to take an overall view of work content, loads and volume, to look back at what has been achieved during the reporting period and agree on performance objectives for the next’. (Armstrong, 2010)

The earliest reference to performance management in the literature was made by Warren (1972). On the basis of his research in a manufacturing company he defined the features of performance management as follows: expectations, skill, feedback, resources and reinforcement. Beer and Ruh (1976) were of the opinion that performance is best developed through practical challenges and experiences on the job with guidance and feedback from superiors. One of the first books devoted exclusively for performance management was published by Plachy and Plachy (1988). Performance management is communication: a manager and an employee arrive together



at an understanding of what work is to be accomplished, how it will be accomplished, how work is progressing toward desired results, and finally what after effort is expended to accomplish the work, whether performance has achieved the agreed upon plan. (Plachy and Plachy, 1988). In the UK the first published reference to performance management was made at a meeting of the Compensation Forum in 1987 by Don Beattie, Personnel Director , ICL, who described how it was used as ‘ an essential contribution to a massive and urgent change programme in the organisation’ and had become a part of the fabric of the business.(Armstrong, 2010)

By 1990 Performance management had entered into the vocabulary of human resource management in the UK as well as in the United States. Full recognition of the existence of performance management was provided by the research project conducted by the Institute of Personnel management (1992).The following definition of performance management was produced as a result of this research: ‘ A strategy that relates to every activity of the organisation set in the context of its human resource policies, culture, style and communications systems. The nature of the strategy depends on the organisational context and can vary from organisation to organisation’. (Armstrong, 2010)

The 1998 IPD research project (Armstrong and Baron, 1998) revealed that in many instances performance management practices had moved on since 1992. Performance management is regarded as a number of intertwined processes. Seen as an unceasing process and not as a once a year appraisal, its spotlight was on employee development rather than on performance related pay. There has been a shift towards getting line managers to accept and own performance management as a natural process of management. The recognition that performance management had to focus on organisational as

well as individual effectiveness, is its ensuing stage of development. As Coens and Jenkins (2002) says: 'An organisation, because it is a system, cannot be significantly improved by focusing on individuals.' The shift now is aligning both organisational and individual performance. Latham, Sulsky and Macdonald (2007) commented that 'a distinguishing feature of performance management relative to performance appraisal is that the former is an on-going process whereas the latter is done at discrete time intervals.' Performance management can be viewed as a natural function of managing that involves the activities of planning, monitoring, analysing and reviewing. It is therefore legitimate to refer to the process of performance management where 'process' is defined as a way of doing things in order to achieve a purpose.

2.2 Performance Management System

Some of the researchers and writers object to associating the word 'system' with performance management because of its connotations with the notion of a sort of mechanism. The debate may continue, but the term 'performance management system' is in universal use. Williams (1998) took a systems view when he identified three models of performance management. 1) performance management as a system for individual performance 2) performance management as a system for managing organisational performance and 3) performance management as a system for managing individual and organisational performance. A performance management system is a set of interrelated activities and processes that are treated holistically as an integrated and key component of an organisation's approach to managing performance through people and developing the skills and capabilities of its human capital, thus augmenting organisational capability and the achievement of sustained competitive advantage (Armstrong, 2012). A



performance management system caters diversified benefits to organisations and empowers organizations to plan, measure and control their performance, so that decisions, resources and activities can be better aligned with strategies to accomplish coveted results (Bento and Bento, 2006). There is evidence that an effective performance management system can lead to enhanced organizational performance (Bevan and Thompson, 1991) and contribute to other imperative outcomes such as improved employee involvement, commitment and motivation (Taylor and Pierce, 1999).

Other dimensions of the concept are evident in literature like performance management system “covers all aspects of performance that are relevant for the existence of an organization as a whole”. The performance management system should provide management with an insight into “how well the organization is performing its tasks and to what extent the organizational objectives are achieved” (Flapper et al., 1996). This can involve motivating, monitoring, controlling, and rewarding employees for attaining desired outcomes (Lawler, 2003). It contributes to aligning the interests of employees and management by providing a clear indication of the strategic direction of the organization (Becker et al., 2011). Performance management systems are a means of executing organizational strategy by signaling to employees what is really imperative in the organization, fixing accountability for behavior and results, and helping to improve performance (Biron et al., 2011; Bae, 2006). Thus the concept of performance management system is indispensable and has abounding benefits. (Kevin Baird H.S, 2012)

2.3 Employee Involvement – Literature Review

Employee involvement means involvement of employees in their business related enhancement activities, processes and cross functional activities. (Holt, Assessment of organisational involvement in implementing

empowerment, 2002). A deeper and richer understanding of job involvement is provided by Kanunga (1982) specifying that job involvement is the individual's level of psychological identification with the specific job in which he or she is engaged. There are two types of involvement: job involvement and employee involvement. Job involvement is a specific belief regarding one's relationship to one's present job. (Bussing, 2002).

Lawler (1991, 1994) sees involvement as commensurate to participation and distinguishes four elements – power, information, knowledge and rewards. Other writers include influence sharing, participative decision making, the degree of employee involvement, empowerment, participation, consultation and other terms (Black and Gregersen, 1997; Glew *et al.*, 1995; cf. Wagner, 1994; Cotton *et al.*, 1988)

In the opinion of Denison (2007), involvement refers to the level of participation by members in an organization's decision-making process. It also means the sense of responsibility and commitment thereby engendered (Denison, 2007). Involvement entails building human capacity, ownership and responsibility. It is very crucial as it leads to united vision, values and purpose. Employee involvement is also termed participative management and it refers to the degree to which employees share information, knowledge, rewards and power throughout the organization (Randolph, 2000; Vroom and Jago, 1988).

Cai (2001) divided employee involvement into the five dimensions: “work concentration”, “work evaluation”, “work identification”, “work participation” and “fun from work”. Alternatively, Yang et al (2006) divided employee involvement into four dimensions, consisting of “fun in work”, “work evaluation”, “work identification”, and “work concentration”.



Employee involvement can be construed as the direct participation of the staff to help an organization fulfill its mission and meet its objectives by applying their own ideas, expertise and efforts towards solving problems and making decisions.(Robert Bullock, 2010)

Astonishing views uncovered by the review include :Employee involvement can take on a number of varieties, such as: (1) downward communications, including employee involvement practices such as a house journal/company newspaper, employee report and regular briefing session, (2) upward problem solving, such as suggestions schemes, attitude surveys, quality circles, and total quality/customer care programs, (3) financial employee involvement, including profit sharing, employee share ownership, and value added or establishment-wide bonus arrangements, and (4) representative participation, such as joint consultative committees/advisory councils and collective bargaining (Marching ton et al, 1992).

Employee involvement is a process designed to empower members of an organization to make decisions and to solve problems appropriate to their level in the organization (Pace, 1989). The logic of employee involvement is that the people closest to a problem or opportunity are in the best position to make decisions for improvement if they have control of the improvement process.(Honguyi Sun, 2000)

2.4 Linkages Between Performance Management System And Employee Involvement

Involvement is more than just the exchange of information. It is the gradual but radical delegation of control to those closest to the process itself. Self-managed teams, cell-based manufacture, autonomous workgroups, high performance work systems, are all examples of true involvement (apostolou, January 2000). Since high performance work systems are part of performance

management system, effective functioning of performance management system implies employee involvement.

Teamwork, recognition, process improvement and measurement are predominantly controlled by operational level employees. All levels of employees have involvement. (Holt, L Jawahar Nesan, Gary D, 2002). As measurement and recognition are components of performance management system; performance management system may lead to establishing the imperativeness of employee involvement.

In order to implement employee involvement and empowerment to an enterprise the following key actions need to take place 1) Giving employee the responsibility 2) Training employee to accept responsibility 3) Communicating and giving feedback 4) Giving rewards and recognition (apostolou, January 2000). Giving rewards and recognition, as a part of performance management system, seems to have a bearing on employee involvement. For achieving higher levels of job involvement, one method is to offer support for employees and the second method is to provide employees with salient rewards. (Michael P. O'Driscoll, 1999). This implies that a good performance management system is germane to employee involvement.

It seems plausible that effective employee involvement systems require relatively sophisticated human resources capacity. Human resource capacity is reflected in more employee-centered systems of supervision, greater use of teamwork, stronger systems of performance assessment, opportunities for career advancement and reward systems that reflect collective performance. (Eurofound, 2013).

This accentuates the notion that performance management system can lead to employee involvement. In one of the studies, it has been depicted that



360 degree feedback can promote increased involvement of people at all levels of the organization. (Diane Bailey , April 2002). As 360 degree feedback is a part of the performance management system, this study contributes to the association between performance management system and employee involvement.

There is evidence that a competent performance management system can result in enhanced organizational performance (Bevan and Thompson, 1991) and contribute to other relevant outcomes such as improved employee involvement, commitment and motivation (Taylor and Pierce, 1999).

3. Objectives and Hypothesis of the study

Main objective of the study

To establish the effect of Performance Management System on Employee Involvement.

Based on the discussion the following hypothesis was developed

Hypothesis 1: There is positive relationship between performance management system and employee involvement

4. Theoretical Framework

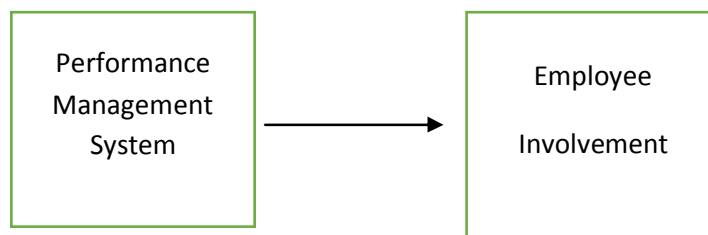


Figure 1: Showing the theoretical framework of the study.

Based on the literature review the theoretical framework shown in the figure was developed. The framework shows that performance management system leads to employee involvement.

5. Sample Size

Scientists were selected for the sample. Scientists are a unique class of people whose performance is difficult to analyse because the idea for an innovation may occur at any time. So evaluating their performance is a challenge. Moreover there is a dearth of literature regarding the performance management system of scientists in India. 100 scientists working in a nationalised research development in the central part of Kerala was selected for the study.

6. Measurement and Instruments

The performance management system questionnaire was adopted from the SHRM/PDI Performance Management Survey 2000. Responses were rated on a five point Likert scale with anchors—(1) strongly disagree to (5) strongly agree.

The employee involvement was measured using the scale (Vandenberg et al., 1999). The responses were measured using a five point Likert scale ranging from strongly disagree (1) to strongly agree (5).

7. Data Analysis

Reliability of the scales was checked. Reliability refers to the ability of the scale to give consistent results. Reliability evaluates the stability, equivalence and homogeneity of the scale. It answers questions like; will the measure employed repeatedly on the same individual yield similar results. Will the measure employed by different investigators yield similar results. Will a set of different operational definitions of the same concept employed



on the same individuals, using the same data collecting technique yield a highly correlated result, or will all items of the measure be internally consistent.

Cronbach Alpha was calculated for both the variables .The independent variable performance management system has a cronbach alpha of 0.897 and the dependant variable employee involvement has a cronbach alpha of 0.940.Both the cronbach alpha values are above the accepted level of .07. Hence we can conclude that the scales performance management system and employee involvement are reliable.

Regression analysis was used for the study. In regression analysis we fit a predictive model to our data and use that model to predict values of the dependant variable from one or more independent variables. Simple regression seeks to predict an outcome variable from a single predictor variable whereas multiple regression seeks to predict an outcome variable from several predictors. R square tells us how much of the variance in Y is accounted for by the regression model .The significance level should be less than .01.(Field, 2005)

7.1 Regression of Performance Management System on Employee Involvement

Table 1 showing the R square and beta value of the regression analysis

R square	0.483
Beta	0.695

From the regression analysis it is evident that there is a positive relationship between Performance Management System and Employee Involvement. The R square value for the regression analysis was found to be

0.483. From this, it is evident that 48.3% variation in employee involvement is predicted by performance management system. Beta value of 0.695 shows the strength of relationship between performance management system and employee involvement.

8 Discussion and Conclusion

The study finds out there is a positive relationship between performance management system and employee involvement. The practical implication of the positive relationship between performance management system and employee involvement is highlighted below. One of the components of performance management system is performance planning and goal setting. Performance planning involves having a clear cut plan for the employees to achieve. For this, the immediate supervisor may communicate to the subordinate about the goals of the organisation. Hence when there is performance planning, it can lead to communication between the superiors and subordinates and when there is proper communication, it can result in employees getting more involved in the activities of the organisation. Therefore performance planning and goal setting can result in more communication among the employees which eventually leads to more and more employee involvement. The practical aspect is that in future organisations can make use of this, by implementing a proper performance management system can result in enhancing the communication among the employees which paves the way for employee involvement. Moreover when employees are more involved, it can result in employees contributing their best to the organisations.

Different types of performance management methods like performance appraisal, 360 degree feedback are all effective in organisations. When there is performance appraisal, the appraisal standards are communicated to the



subordinates. Moreover 360 degree feedback results in interaction among all levels of employees. All these lead to more and more communication among the employee and as stated earlier, communication results in involvement among the employees. Hence, the practical aspect of the study is that by employing different types of performance management methods in organisations, managers can motivate the employees to become more and more involved in the study and through enhanced employee involvement, the organisation can reap many benefits like organisational success.

When performance management system is implemented, it can employ various ways of developing the employees. One among it is coaching or mentoring. Mentoring is one of the methods adopted by superiors to develop subordinates. When organisations adopt such methods it can result in making employees feel that they are wanted by the organisations, they develop a sense of belongingness to the organisations which ultimately result in employee involvement. The practical benefit of this is that organisations can always develop the system of mentoring or coaching when there is a performance management system and this can lead to employee involvement.

By instituting and implementing effectively a performance management system, the organisation will have performance management evaluation and performance management rewards. The performance of the employees are evaluated and rewards are given to them on this basis. This results in employees becoming more and more aware that the performance management system practices are beneficial for them, it helps them to evaluate their performance and they are getting rewards on the basis of this performance management system practices. Employees thus feel that performance management system is good for them and as a result of this, they show willingness to participate in the decisions affecting them. The

practical aspect of this study is that managers by implementing a proper performance management system can always direct employees in evaluating their performance and their rewards, thereby resulting in the employees developing the confidence to participate in the decisions affecting them which means that there will be employee involvement at a higher level. This empirical study on the Impact of Performance Management System on Employee Involvement conducted among the Scientists of R&D Organizations, confirms the claims expressed.

References

- Armstrong, M. (2010). *Armstrong's Handbook of Performance Management. An evidence based guide to delivering high performance*. New Delhi: Kogan Page India Private Limited.
- Ahiau, E. A. (2013). Employee Involvement and Organisational Effectiveness. *Journal of Management Development*, 661-674.
- (April 2002). 360 degree feedback, Bulletin to accompany the gee training handbook. Lancashire: Diane Bailey Associates
- Bevan, S. and Thompson, M. (1991), "Performance management at the cross-roads", *Personnel Management*, November, pp. 36-40.
- Becker, K., Antuar, N. and Everett, C. (2011), "Implementing an employee performance Management system in a nonprofit organization", *Nonprofit Management & Leadership*, Vol. 21 No. 3, pp. 255-71.
- Bishop, B. F. (2003). TQM Workforce Factors And Employee Involvement: The Pivotal Role Of Teamwork. *Journal of Managerial Issues*, 393-412.
- Biron, M., Farndale, E. and Paauwe, J. (2011), "Performance management effectiveness: lessons from world-leading firms", *The International Journal of Human Resource Management*, Vol. 22 No. 6, pp. 1294-311.



- Bussing, A. (2002). Trust and its relations to commitment and involvement in work and organisations. *SA Journal of Industrial Psychology*, 36-42.
- Flapper, S.D.P., Fortuin, L. and Stoop, P.P. (1996), "Towards consistent performancemanagement systems", *International Journal of Operations & Production Management*, Vol. 16 No. 7, pp. 27-37.
- Drucker, P. F. (1973). *Management:Tasks,Responsibilities,Practices*. Newyork: Harper&Row.
- Eurofound. (2013). *Work organisation and employee involvement in Europe*. Luxembourg: Publications office of European Union.
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis* (7th ed.). Englewood Cliffs: Prentice Hall
- Holt, L. J. (2002). Assessment of organisational involvement in implementing empowerment. *Integrated Manufacturing systems*, 13/4 (201-211).
- Holt, L. J. (2002). Assessment of organisational involvement in implementing empowerment. *Integrated Manufacturing Systems*, 201-211.
- Honguyi Sun, I. K. (2000). Employee Involvement and Quality Management. *The TQM Magazine*, 350-354.
- Judeh, M. (2011). An examination of the effect of employee involvement on teamwork effectiveness:An empirical study. *International Journal of Business and Management*.
- Lawler, E.E. (2003), "Reward practices and performance management system effectiveness",
- Organizational Dynamics, Vol. 32 No. 4, pp. 396- lou, A. t. (January 2000). *Employee Involvement : Report produced for the EC Funded Projec*
- Michael P. O'Driscoll, D. M. (1999). Perceived Organisational Support, Satisfaction with rewards,and Employee Job Involvement and Organisational Commitment. *Applied Psychology: An International Reiew*, 48 (2). 197-209.

- Nunnally, J.C., Bernstein, I.H. (1994). *Psychometric theory*. New York: McGraw-Hill.
- Obisi,Chris(Dec 2011)." Employee performance appraisal and its implication for individual and organisational growth ", Australian Journal of Business and Management Research ,Vol 1,No.9,92 -97
- Robbins, S. P. (1994). *Organisational Behaviour*. NewDelhi: Prentice Hall of India.
- Robert Bullock, S.-P. (n.d.). *Employee Involvement*.
- Robert Gary E.(Winter 1994), " Maximising performance appraisal system acceptance:perspectives from muncipal government perspectives ",Public Personnel Management,Vol 23 ,No 4.
- Taylor, P.J. and Pierce, J.L. (1999), "Effects of introducing a performance management system on employees' subsequent attitudes and effort", Public Personnel Management, Vol. 28 No. 3, pp. 423-52.
- Talbot, M. 1997. Partial Least Squares Regression.
- Zeffane, D. M. (2010). The International Journal of Human Resource Management. *Employee Involvement,Organisational change and trust in management*, 55-75.



THE ROLE OF ONLINE SOCIAL CAPITAL IN HUMAN RESOURCE MANAGEMENT: A CONCEPTUAL MODEL

Sangeetha K. L¹, Dr. D. Mavoothu²

^{1,2} School of Management Studies, Cochin University of Science and Technology, Kochi -21

Abstract

An effective Human Resource Management system is vital for the success of any organization. The quality of the relationship among the employees in the organization is one of the most important areas for the Human resource managers to pay attention. This study focuses on one of the critical resources in organisation i.e., social capital. With the introduction of social media and social networking sites, new forms of relationship building has been occurring among the employees and the researchers in the field of social capital suggest the possibility of new forms of social capital and relationship building through these sites. This study tries to highlight the relevance of online social capital in organisational context, describes the dimensions of online social capital and show up how Human Resource Management is related with online social capital. It could be hypothesised that online social capital in organizational context could be used as a powerful tool for human resource management and thereby achieve desired organizational outcomes.

Keywords: Human Resource Management - Organizational social capital-online social capital

1. Introduction

The resource based view of management is widely accepted by researchers and most of the scholars agreed that in order to get a competitive advantage the organization should channelize its resources in such a way that organizational objectives can be achieved. Miller and Shamsie (1996) argued that researchers should add precision to the resource based view by

specifying the different types of advantages associated with different types of resources. Among different resources available to the organisation, physical and financial resources are much studied in literature and thus we focus on one of the critical resources in organisation i.e., social capital. Social capital has been explicitly identified as resources that can be directly linked to firm performance (Collins and Clark, 2003; Subramaniam and Youdt, 2005). Social capital in the organizational context can be defined as the function of the value of individual's relationship with other employees in the organization. Social capital concept within the organisational theory has been studied by a large body of research. Even though there are studies which explain the importance of organizational social capital, those studies are related with the social structure concept of social capital. The structural element of social capital has transited from physical work settings to online or virtual work environment with the introduction of social media and the related technologies. In this online networking era, the new organizational forms such as virtual work, the formation of inter organizational networks etc is gaining much attention to the researchers. In this context, it is argued that the relationship between employees in the organisation has also been shifting from physical organisation set up to online platform.

The intended contributions of this study are twofold. First, it will describe the relevance of online social capital in organizational context by analysing the dimensions of social capital. Second, this study will link the online social capital to Human Resource Management.

2. Literature Review

The following are the literature reviews on social capital, online social capital and dimensions of social capital.



2.1 Social Capital

Although the concept of social capital is old and widely used in various disciplines, the researchers and academicians in social science have started extensive research on this topic in late 1995 only. Social capital is becoming a core concept in business, political science, public health and sociology (Williams, 2006). James Coleman was the first person to develop a theoretical framework for the concept of social capital. He defined social capital as “the set of resources that inhere in family relations and in community social organizations and that are useful for the cognitive or social development of a young child or young person” (Coleman, 1988).

Social capital is defined as *“the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition”* by Bourdieu (1986). Putnam (1993) defined social capital as *“features of social organization, such as trust, norms, and networks.”* Bourdieu and Wacquant (1992) defined social capital as *“the sum of the resources, actual or virtual, that accrues to an individual or a group by virtue of possessing a durable network of more or less institutionalized relationships of mutual acquaintance and recognition”*. Nahapiet and Ghoshal (1998) studied social capital from organizational perspective and defined social capital as *“the sum of the actual or potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit. Social capital thus comprises both the network and the assets that may be mobilized through that network”*.

Social capital has aspects on both individual and collective level. The research on social capital has focused their views either as a property of individual and their social networks or as a feature of the community and the

degree of civic engagement and trust among its members. Even though scholars use a variety of conceptualization to emphasize various aspects of social capital (Adler & Kwon, 2002; Leana & Van Buren, 1999), organizational studies describes social capital as a social unit attribute that benefits both individual members (employees) and the social unit (organization) as a whole (eg. Bourdieu, 1986; Coleman, 1988).

2.2 Online Social Capital

Social capital development via social networking sites such as Facebook and MySpace tend to be bridging or bonding social capital and thus virtual social capital or online social capital is a new area of research (Ellison et al, 2007). Online social capital refers to the connection between individuals created with online sources like online social networking sties and social media. The concept of online social capital has been introduced in social community studies where one's participation in the offline social associations has shifted to participation in online social associations with the introduction of Social Networking sites like Facebook and MySpace. In view of this, the organization are considered as social communities in which employees or the individual actors engage in communication or work related information are shared with others. Just like social association in online networks, online groups provide the employees a platform for social interaction and communication between employees in the organization. Employees in an organization share with others firm-specific, tacit knowledge that can promote organizational outcomes (Tsai and Ghoshal, 1998). This interaction can significantly influence one's social capital both individual and collective level. Group level social capital is much more important to an organization than individual level social capital as group level social capital is related with a number of organizational outcomes.



Thus it is argued that online social networks create online social capital (both individual and group level) that could help achievement of desired organizational objectives.

2.3 Dimensions of Social Capital

Social capital concept within the context of organizational theory has been studied by a large body of research due to its importance on value creation in the global era. According to several authors social capital integrates three dimensions, namely Structural social capital, relational social capital and cognitive social capital (Ghoshal, 1998; Tsai, 1998). The **structural dimension** of social capital refers to the extent to which people in an organisation are connected and access to the intellectual capital of others; it captures the existing relationships that offer the opportunity for acquiring resources or acting together. The structural dimension of social capital is related with whom and in what frequency people in an organization share information and resources (Coleman, 1990; Moran, 2006). And this network helps an individual to reduce the amount of time and investment required to gather information, increase information and resources transfer and also increase the inter-unit interaction among the members of the organization. The **relational social capital** on the other hand leads with the nature and quality of the connections among the employees and it includes the motivation of members to interact and act collaboratively. It reflects how relationships understood as a history of interactions (Granovetter, 1982), are characterized by trust, reciprocity and emotional intensity (Moran, 2006). And the third, **cognitive dimension of social capital** refers to the extent to which employees possess a common language and shared narratives (Bolino et al, 2002). When individuals share collective goals and have the same perceptions of how to interact with others, which will generate more

opportunities to exchange knowledge and resources (Tsai, 1998). The cognitive social capital assesses the ability of individuals to act together (Nahapiet and Ghoshal, 1998).

Social capital is a multi-dimensional concept that describes the quality of social relations that lead to mutual benefit for the individuals or actors. Most of the organizational social capital literature explains social capital by three dimensions: structural, relational and cognitive social capital dimensions. In this study also, we try to analyse these three dimensions of social capital but through the lens of online social capital. In the online platform also employees build relationship through structural, relational and cognitive social capital forms. The structural social capital in online context can be defined as the Online bridging social capital and Online bonding social capital. Some of the academicians in the field of social capital categorised social capital as internal (between employees) or external (between employees and client) ties. External ties can be otherwise called as Bridging social capital where online interactions by the employees or organization utilise their egocentric links with other social actors (Burt, 1992). Bonding social capital or the internal ties between employees or organisation emphasize on the linkages or ties with a particular group which concentrates on collective rather than the individuals. The relational dimension is assessed as trust created by members of the online networks. Online social networks are working on the basic characteristics of trust among employees. Trust can be enhanced with positive social interaction with group members. And high level of trust leads to better organizational outcomes. It is argued that the relational dimension of social capital in online context influences the performance of the employees. Cognitive dimension is treated as the shared vision and languages created through



online interaction by the employees and organization. Online cognitive social capital ie., shared or collective vision of employees can be easily achieved with the help of online social networks. As all employees are interconnected with the online networks, frequent job related communication will enable the employees to make aware of how ones work is related to others work. Thus, employees can easily update the changes in work etc. at high speed.

3. Social Capital and HRM

Human Resource Management can be defined as “all management decisions and activities that affect the nature of the relationship between the organization and employees – the human resources” (Beer et al, 1984). Human resources are considered as the valuable assets and major strength of all organizations. The major focus of the Human Resource Management is to ensure that the organization obtains, retains and develops its workforce. In the phase of technological challenges and changing trends in global economy the need of effective Human Resource Management is very high. The HR managers must maintain social relationship with the employees in addition to the professional knowledge. The importance of social capital in an organizational setting varies from access to resources, distribution of available resources to different units and to development of new ideas. The relationship between HRM practices and social capital at organizational level show that HRM practices strengthen the relational co-ordination among the employees who perform distinct functions. HRM practices can play a critical role in facilitating the development and implementation of organizational social capital. For example, Clark (2003) found out that high commitment, relationship based practices tend to create bonds and trust, which in turn feed social capital. It is also evident from the literature that people with better

social capital can find better jobs more quickly (Granovetter, 1973) get promotions early, help their teams reach their goals rapidly, perform better as project managers, help their teams to generate creative solutions and co-ordinate projects more effectively (Burt, 2001; Gabbay and Shaul, 1997; Mark et al, 2000; Arent, 1999).

Researchers recognise that traditional prescriptions of HRM practices may not be relevant to Organizational social capital, and HRM practices must incorporate the development of relationships (Gittell et al, 2010; Morris et al, 2002). In this context, it is suggested that online social capital can be used as a better tool for Human Resource Management.

3.1 Issues and Challenges

The social capital development in the organization may be viewed from business or commercial points of view by both employees and management. It can be noted that the strategic HRM is already seen as an exploitative tool of management by the employees. Another issue is that social capital development activities cannot be as organized as HRM activities. Also, social media technologies are fast changing. It is very difficult to keep pace with the changing technology for the organization. In the physical organization set up, people are very formal, artificial and protocol-oriented. So they may not fully reveal themselves in a social context. Lastly, too much of social capital initiatives may create production and productivity problems to the organization.

3.2 Strategies

The online networking phenomena, incorporating Facebook, MySpace and LinkedIn have become a major aspect of e-communication inside and outside the workplace in recent years. Social networking sites often provide access to



information and other resources- often at higher speed and less cost than when they have to be acquired through other sources such as formal documentation and training with management. Strategic HRM practices that focus on the development and promotion of online social capital must create opportunities for employees to make social relationships, enhance their effort in developing social relations, and increase their ability to maintain and enhance online relationships. Human Resource managers must figure out the opportunities and challenges that online social capital poses for the effective operation of their organizations. Human Resource Management managers should arrange a platform to the employees for interaction with other individuals for building inter-personal relationships. HR managers can use online social networks to promote employee interaction and thereby online social capital development. While framing Human Resource Management practices special attention need to be done to motivate employees to build social capital. For example, when a new employee is selected to the organization, orientation programs can be conducted through these sites and can communicate the culture and values of the firms well in advance to the new employees. Online platforms also provide the employees to develop good relationship with co-workers with online social capital development. HRM practices should incorporate the policies in order to develop employees' online inter-personal skill in addition to technical skill as online social capital is less at cost.

4. Conclusion

In the Online social networking age, developments in technology and social interaction will continue to have a significant influence on organizations and relationships among employees. Hence, the HR managers should be at the forefront of managing and understanding the impact and implications of these technologies in their workplace. Consistent with the

literature on social capital at the organizational context, relative importance of online social capital and its linkage to HRM practices, this study suggest that Human Resource Management practices should provide necessary opportunities for the employees to build social relationship online, encourage their effort towards online social capital development, etc.

References

- Adler, P. &. (2002). *Social Capital: Prospects for a new concept*. Academy of Management Review.
- Arent, G. (1999). Comparing the Influence of Human capital and social capital on Performance. *Sunbelt Social Network Conferece. XIX*.
- Beer, M. S. (1984). *Managing Human Assets*. New York: The Free Press.
- Bolino, M. C. (2002). Citizenship Behaviour and the creation of social capital in organizations. *Academy of Management Review*, 27 (4), 505-522.
- Bourdieu, P. (1986). Forms of Capital. In J. Richardson, *Handbook of theory and research for the sociology education* (pp. 241-258). NewYork: Greenwood.
- Bourdieu, P. (1992). *An Invitation to Reflexive Sociology*. Chicago: University of Chicago Press. .
- Burt, R. (1992). *Structural Holes: The Social Structure of Competition*. Cambridge: Harvard University Press.
- Burt, R. (2001). Structural Holes versus network closure as social capital. In N. C. Lin, *Social Capital: Theory and Research*. New York.
- Clark, (2003). Strategic Human Resource Practices, Top Management Team Social Networks, and Firm Performance: The rold of Human Resource Practices in creating Organizational Competitive Advantage. *Academy of Management Journal* 46 (6), 740-751.
- Coleman, J. (1988). Social Capital and the Creation of Human Capital. *The American Journal of Sociology*, S95-S120.
- Ellison Nicole, B. S. (2007). The Benefit of Facebook "Friends". Social capital and College student's use of online social networking sites.



- Gabbay, S. M. (1997). Social Capital in the Creation of Financial Capital. *Stipes*.
- Ghoshal, N. J. (1998). Social Capital, Intellectual Capital and the organizational advantage. *Academy of Management Review*, 242-266.
- Gittel, J. H. (2010). A Relational Model of how high-performance work systems work. *Organizational Science*, 21 (2), 490-506.
- Granovetter. (1973). The strength of Weak ties. *American journal of Sociology*, 1360-1380.
- Granovetter, M. (1982). The Strength of weak ties: A network theory revisited. In P. M. N. Lin, *Social Structure and Network Analysis* (pp. 105-130). Thousand Oaks: Sage Publications.
- Leana, C. R., V. B. (1999). Organizational social capital and employment practices. *Academy of Management Review* 24 (3), 538-555.
- Mark, S. M. (2000). Strategic Social Capital and Deal Making in a Large Commercial Bank. *Sunbelg Soical Network Conferece.XX*.
- Miller, D. a. (1996). The Resource based view of the Firm in Two Environments: The Hollywood Film Studios from 1936 to 1965. *Academy of Management Journal* 39 (3), 519-543.
- Moore, J. H. (1979). A Framework for MIS Software Development Projects. *MIS Quarterly* 3(1), 29-38.
- Moran, M. E.-G. (2006). Students acceptance of Tablet PCs. *2006 Annual Meeting of Decisions Sciences Institute*, 2845-2850. San Antonio.
- Morris S, (2002). Extending Human Resource Architecture: Implications from Social Capital theory. *Academy of Management Conference*, (pp. 9-14). Denver, Colorado.
- Putnam (1993). The Prosperous Community: Social Capital and Public Life. *American Prospect* 13, 35-42.
- Subramaniam (2005). The Influence of Intellectual Capital on the Types of Innovative Capabilities. *Academy of Management Journal* 48 (3), 450-463.
- Tsai (1998). Social capital and value creation: The role of intra-firm networks. *Academy of Management Journal*, 464- 478.
- Williams, D. (2006). On and Off the Net: Scales for Social Capital in an Online Era. *Journal of Computer Mediated Communication*, Article 11.

**BHARATA MATA JOURNAL
Of
Multidisciplinary Studies**

BMJMS is a biannual multidisciplinary reference journal with a wide spectrum of contemporary contributions in the various genres of science, management, humanities and social sciences aimed for fertile interaction, interpretation and sharing of knowledge.

SUBSCRIPTION RATES

Individual Annual (two issues) Rs. 300/-
Institution Annual (two issues) Rs. 500/-

Payment must be made through demand draft in favour of Principal, Bharata Mata College, Thrikkakara, Kochi-21 payable at State Bank of Travancore, Vazhakkala.

CALL FOR PAPERS

Next Issue	: Volume 3 Issue 2, July 2016
Last Date for submission of Research papers	: May 31, 2016
Address for Communication	: Chief Editor Bharata Mata Journal of Multidisciplinary Studies Bharata Mata College Thrikkakara, Kochi Kerala- 682021 Mob: 9446947917, 9895719059 E mail: bharatamatajournal@gmail.com

Guidelines for submission of research paper

1. Electronic submission of the manuscript as MS word file attached to an e-mail message sent to bharatamatajournal@gmail.com along with a hard copy, is the desired format for submission of papers.
2. Manuscript should have a size of 7-10 pages (A4 sized) ; 12 point Times New Roman, 1.5 spacing. Papers from humanity category should follow the MLA style of documentation.
3. Centred title should be brief, followed by centred name, affiliation and address of author(s). Indicate to whom correspondence should be sent, including a telephone number and e-mail address.
4. Manuscript should be in the order – 100 to 150 word abstract, 200 to 300 word Introduction followed by the main text document and 50-100 word conclusion summarising the findings of the paper.
5. Illustrations
 - a. Computer generated graphics should be in tif files, in 300 dpi resolution
 - b. Graphs should not be larger than 20x25 cm. Measurements should be indicated in SI units. Grids should not be shown in the graph.
 - c. Photographs should be supplied as glossy prints, of the same size as they are to appear in the journal.
 - d. Illustrations should be referred to as Fig.1, Fig.2 etc followed by a caption at the bottom of the figure.
6. Journal and Book references should be identified in the text using the Vancouver system (numbered throughout the text and numbered list at the end of the article).

Reference should be listed by number at the end of the manuscript as reference number, Author(s), *title of article*, Journal name, year of publication, volume; page.

Eg. 1. Name A.A. , Name B.B. , *Effect of Carbon Black on Devulcanized Ground Rubber Tire Vulcanizates*, Journal of Elastomers and Plastics, USA, 2013, **56**(2); 275-283.

Text references as reference number, Author(s), *name of the chapter*, Name of the book and publisher, year of publication, page.
7. Figures, tables and equations should be inside the text near/after where they are referred in the text. Tables should be numbered consecutively with a heading. Use Arabic numerals. Column headings should be explanatory and carry units. Do not include vertical lines.

Table 1 Damage location accuracy

Sl.No	Predicted location(m)	Actual location(m)	Error (%)
1	1.54	1.53	0.002
2	1.98	1.67	0.006
3	1.87	1.61	0.224

8. Papers prepared on the basis of a questionnaire survey must include the questionnaire also along with the manuscript.
9. Contributors' assurance in the prescribed format that the paper is original in nature and has not been published/accepted for publication elsewhere is needed.
10. The copyrights of the contributions published in the journal lie with the publishers of the journal.
11. The author alone will be liable in respect of any dispute involving violation of the copyright in respect of the material given by him or her for publication in the journal.
12. The editor reserves the right to make required editing of the manuscript.
13. The journal is published bi-annually in January and July.
14. The decision regarding the acceptance or otherwise of any contribution will normally be intimated within two months. We do not take the responsibility to return unaccepted manuscript.
