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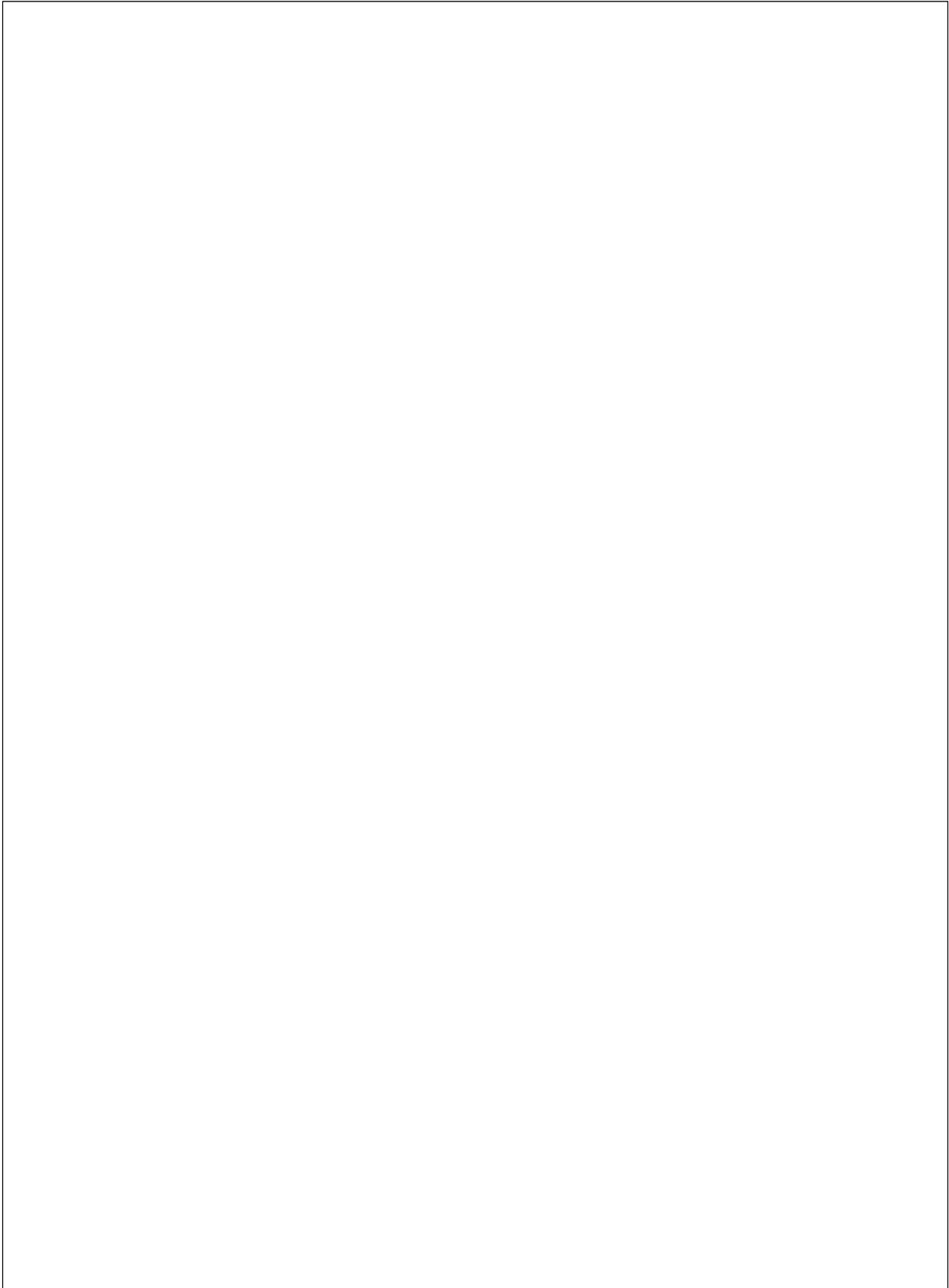
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Effective Packaging: A Stimulation to Buying Behavior with Respect to Food & Beverages

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Abstract

Packaging is the container for a product, encompassing the physical appearance of the container and including the design, colour, shape, labelling and materials used". Packaging has a huge role to play in the positioning of products. Package design shapes consumer perceptions and can be the determining factor in point-of-purchase decisions which characterize the majority of shopping occasions. The purpose of this study is to determine the elements which define packaging of food and beverage products along with their interrelationships amongst themselves. It also analyzes the relationship between demographics and select elements of Food and Beverage packaging. It is a descriptive research conducted by distributing a structured questionnaire designed on a five point likert scale. Data is collected using convenience sampling and analysed with the help of SPSS 20.0. It was observed that packaging as a combination of all the elements did not show any significant relationship with the demographic factors. Informational element was found to be most effective and important in case of packaging of food and beverages, this implied that consumers perception is influenced the most by the manufactured and expiry dates as well information printed on the label. While looking at interrelationships between four elements, it showed moderate levels of association amongst each other. This research can be an effective input to many companies to reconsider their packaging approach and better understand their consumer behaviour in relation to their packaging efforts.

Keywords: packaging, consumer behaviour, brand, functional, informational, visual elements

Introduction

In recent years the marketing environment has become increasingly complex and competitive. A product's packaging is something which all buyers experience and which has strong potential to engage the majority of the target market. This makes it an extremely powerful and unique tool in the modern marketing environment.

During the last decades, food consumption has observed several trends that have to do with changes in social and economic environment as well as in lifestyle. Urbanization has resulted in increased consumption of packaged and processed food;

consumers are now seeking their food in packages on the shelves of food stores. Packaged foods have the largest market share of food in developed countries and there is a trend for big increase in their market share in developing countries as the income of consumer is increasing.

Packaged food sector is presently the fifth largest sector in India and has grown rapidly over the past few years. Indian packaged food industry has escalated remarkably at a CAGR of 15.6% from FY'2007-FY'2013. The packaged food industry in India has been characterized by low rural penetration coupled with a strong prevalence of the unorganized sector for years. Attributing to factors such as, low affordability, lack of awareness and preference towards home cooked food, penetration of packaged foods has remained low among rural households. Rural areas therefore establish a huge untapped market for the transactions of wrapped foods in India.

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Marketers of food companies are asked to overcome this competition using every possible marketing tool and trying to create the best possible marketing mix. Among other means to communicate this message is the food package itself. Packing is a communication device providing details about the product, including price, contents, ingredients and nutritional value as well as cooking instructions and recommended use by dates. The role of packaging as a means of communication with the consumer and choosing trademarks is growing constantly. In order to fulfill the communication goals, it is necessary for the producers to acquire adequate information regarding the customer's psychology. In this study, packaging of food products is divided into four major elements. The first is **Brand Elements**. Kotler suggests that a brand is one of the most valuable intangible assets of the company and is at the heart of the firm's products or services. Whilst most brand practitioners argue that the package design is an important component of the brand strategy, literature on packaging information tends to view the brand elements as a key ingredient of the product informational package elements. In food packaging, the brand strategy plays a pivotal role in reducing time spent on consumer search as it facilitates brand identification (Bassin, 1988). A well-coordinated branding strategy with a good brand name, slogan, logo, symbols, and character can be influential in the purchase of breakfast cereals. The next is a **functional element** that is a correspondence of packaging to its practical purpose. The roles the package fulfills are related to psychological function, where the package interacts with the consumer and to physical property of a package on a stage of production and product preservation. The three prime functions of packaging are 'To contain, To protect and To identify'. The third element is **informational element**. Communication of information is one of the core functions of the packaging. This helps customers to make the right decisions in the purchasing process. Food labeling is used to inform consumers of the properties of pre-packaged food. The most important rule of labeling is that the consumer should not be misled. In order to safe guard the interest of the consumer, The Food Safety and Standards (Packaging and Labeling) Regulations,

2011, provides that every packaged food article has to be labeled and it shall provide the required information. Last but not the least is **Visual Elements**. Grossman & Wisenblit (1999) say that the decision making for low involvement products includes the evaluation of packaging design attributes which is less important, while the graphics and color become more valuable and noticeable. They suggest that the consumer behaviour towards the low involvement products can be influenced by the development of marketing communications which includes image building. Graphics include image layout, colour combination, typography, and product photography. The combination of all these components communicates an image. Graphics on the package tells about detailed information about the product. It becomes a product branding or identity, followed by the information. According to Herrington & Capella (1995), when the consumers examine packages in the supermarket, the differential perception and the positioning of the graphics can be the difference between identifying and missing the product. However, eye-catching graphics make the product stand out on the shelf and attract the consumers. All these four elements and the behaviour of the consumer towards them have been a major issue of interest for the marketing researchers during the last decades. Variation of consumer behaviour is because of the effect of different factors influencing the behaviour and motivation of the person enabling purchases. The existence of different groups of consumers for the markets of a single product indicates wide differences. The consumer is considered today as the major key to the success or the failure of a company. Identification of these relations and examination of the role of different packaging components in the behaviour of the consumer will undoubtedly identify the strengths and the weaknesses of the companies for entering into competitive markets. Therefore the essential question of the present research is how the different aspects of product packaging influence the purchasing behaviour of the consumer. In other words how the individual aspects of product packaging, i.e. colour, design, functionality etc of packaging influences the purchasing behaviour of the consumer?

Literature Review

According to **Rita Kuvykaite (2009)** package attracts consumer's attention to particular brand, enhances its image, and influences consumer's perceptions about product. Also package imparts unique value to products, works as a tool for differentiation, i.e. helps consumers to choose the product from wide range of similar products, and stimulates customers buying behavior. At the same time, **Ulrich R. Orth (2009)** worked on packaging design as resource for the construction of Brand Identity. A thorough review of the literature on packaging design reveals that there are no meaningful guidelines for developing holistic packaging design, Shapes, Finishes, Sizes, Images, Typography, Colors, Impressions, Purchase Intention, and Brand. This research aimed at generating guidelines for managing strategic brand impressions, namely brand identity created by the wine packaging design. **Kriti Bardhan Gupta (2009)** has also conducted a study on consumer behaviour for Food Products in India. The relative importance of various food purchasing criteria was estimated for four different food categories, food and vegetables; milk and milk products; food grains and pulses; and processed foods on 1-5 scale, The present study explored the consumer behaviour for food products in India from different perspectives. People accepted the fact that their food habits get affected while shifting to a new region but many basic buying and consumption behaviour do not change. Some of the changes in buying and consumption behaviour of relocated people, which were observed after their settlement to a new region, were not significantly different from the level of changes in behaviour of non-moving people. From an economical and environmental perspective it is very costly to apply sales packaging (with additional material use and transport volume) to products that do not need them, or to apply them in an ineffective way. Economical costs and environmental impact can be expressed in a single score, indicating the packs performance. To allow proper management of the pack design the sales performance should be expressed in as simple way as possible, preferably also a single score. As calculating the sales performance is impossible a test will need to be used. The pressure from time-to-market in the CE

industry, demands that the test be relatively simple. According to **Héroux et al. (1988)**, marketers spend considerable time and money on packaging products in a manner that will attract consumer attention and promote its consumption. **PiresGon, Calves, Ricardo (2008)** worked on Product Characteristics and Quality Perception, and suggested that consumers are faced with quality and product performance uncertainty; hence, they rely on cues as extrinsic attributes, for instance brand, price, package and warranty, as signals of perceived quality. Little research has been done on packages as extrinsic attributes used by consumers as signs of perceived quality, thus this study is a small contribution to that lack of scholarly research on packages. The model proposed in this study builds on previous models of consumer quality perception and signals of quality from product cues. In this research, colors and shapes combinations in labels are considered as the extrinsic attributes used as signals of quality by consumers.

Liang Lu (2008) suggested that packaging is an important part of the product that not only serves a functional purpose, but also acts as a mean of communicative information for the products and brand character. Packaging must be functional; it must protect the products in good storage, in shipment and often in use. Besides, it has also the function that can give customers the ease of access and use on the purpose of convenience. Previous to this, **Silayoi and Speece (2007)** performed a conjoint analysis in order to investigate what is the importance of different packing design attributes for consumers. Results showed strong segmentation in response to packaging. The three segments, convenience oriented, information seeking, and image seeking, follow patterns common worldwide. To some extent, this suggests that on a broad level, middle class urban consumer behavior in Thailand is becoming similar to other developed countries. In other words, these consumers view the package as a coherent whole, stressing one aspect or another, but not completely ignoring any element. There may not be a single ideal design for the whole market, but the most effective single package would probably need to have a technology image which clearly conveys convenience and ease of use; list clear product information, and

have more classic, traditional graphic design, colors, and shape. The conjoint results indicate that packaging technology (which conveys a message of convenience and ease of use in this study) plays the most important role in consumer likelihood to buy. Looking at a different objective of a **Marshall's, Stuart's & Bell's study (2006)**, it was to determine the role of packaging color in product selection among preschoolers, by age and gender, across three product categories: cereals, biscuits and drinks. The results showcased a high correlation between favourite colour and choice of product across the total sample, with lower correlations for individuals. **Mitul M. Deliya & Bhavesh J. Parmar (2012)** in their paper discussed the role of packaging on consumer buying behaviour. They researched the relationship between independent variable and dependent variables and concluded that consumer buying behavior is dependent on the packaging and on its features. Due to increasing self-service and changing consumers' lifestyle the interest in package as a tool of sales promotion and stimulator of impulsive buying behaviour is growing progressively. So package performs an important role in marketing communications, especially in the point of sale and could be treated as one of the most important factors influencing consumer's purchase decision. Following this, **Rashid Saeed, Rab Nawaz Lodhi, Abdul Rauf, Muhammad IqbalRana, Zahid Mahmood and Moeed Ahmad (2013)** determined the impact of labeling on consumer buying behaviour. The data analyzed through descriptive statistics, correlation and linear regression techniques showed that advertisement has positive relationship with consumer buying behaviour. The results of regression analysis showed that labeling positively influences consumer buying behaviour. Consumers purchase more quantity of the products after looking at a well labeled product. Therefore labeling influences the consumer buying behaviour. But there are some other factors also which influence the consumer buying behavior. **Rangsan Nochai and Titida Nochai (2011)** in their paper aim to investigate the sales promotion factors that impact on consumers' purchasing decision on Portable PCs or notebooks in Thailand. They suggested that the sales promotion factors "Offer member card for discount", "Extend warranty period", "Bundled with scanner", "Billboard, radio, leaflet, and

magazine", and "Able to pay by installments" are the important factors that impact on consumers' purchasing decision on Portable PCs. Furthermore, the marketer can enhance more effectiveness of customers need, increase customer base and increase market shares in this segmentation by using sale promotion strategies of developing member card for discount, increasing the number of advertising media, warranty period conditions, setting the special premiums, and pay by installments. Also, **Mahdia FarrukhSial (2011)** measured the impact of packaging and labeling on consumer buying behaviour. He also investigates the mediation of brand image for the relationship of packaging and labeling with consumer buying behaviour. Results revealed that packaging is positively associated with consumer buying behavior. Further it is found that brand image mediates the relationship of packaging and consumer buying behaviour only.

Objectives of Research

1. To identify the elements which affect Food and Beverage packaging.
2. To analyse the relationship between select elements of Food and Beverage packaging.
3. To analyse the relationship between demographics and select elements of Food and Beverage packaging

Research Methodology

A structured questionnaire is used as the research instrument for the study. Questionnaire for the survey is divided into two parts. The first part is aimed at demographic profile of the respondents and second part covers the questions on various aspects and elements of packaging. The questionnaire is developed on five point likert scale. Cronbach's alpha is used as a measure of internal consistency or reliability of a psychometric instrument. The value of Cronbach's Alpha is greater than .8, which indicates a good level of internal consistency and reliability of the questionnaire.

Sampling and Data Collection

The study was conducted in Delhi and NCR region. The questionnaire was distributed to 120 respondents

Data Analysis & Interpretation

Table-1: Demographic Profile

Category	Frequency	Percentage
Age Group <ul style="list-style-type: none"> ● 18 -25 ● 26 – 30 ● 31 – 35 ● 35 and Above 	72 13 7 2	76.6 13.8 7.4 2.1
Gender <ul style="list-style-type: none"> ● Male ● Female 	55 39	58.5 41.5
Marital Status <ul style="list-style-type: none"> ● Married ● Unmarried 	12 82	12.8 87.2
Occupation <ul style="list-style-type: none"> ● Working ● Student 	26 68	27.7 72.3
Educational Qualification <ul style="list-style-type: none"> ● Under Graduate ● Graduate ● Post Graduate 	2 39 53	2.1 41.5 56.4
Monthly Salary <ul style="list-style-type: none"> ● Less than 15000 ● 15000 – 25000 ● 25000 – 35000 ● 35000 and above 	57 14 13 10	60.6 14.9 13.8 10.6
Amount spent on packaged food products per month <ul style="list-style-type: none"> ● Less than 2500 ● 2500 – 5000 ● 5000 – 7500 ● 7500 and above 	50 29 10 5	53.2 30.9 10.6 5.3

but completely filled in questionnaire received were 94. The scale used to answer the questions in the following study is very Influential, Influential, Neutral, Rarely influential, Not at all influential with 1 as very influential and 5 as not at all influential. So according to the scale the factor having lower mean value have more significance than the factors it is compared with. Convenience sampling technique was used since the subjects are selected because of their convenient accessibility and proximity to the researcher.

Methodology Used for Data Analysis

Mean analysis has been used to study the comparative importance of four elements of packaging i.e. brand elements, functional elements, informational elements and visual elements. Also, correlation analysis is carried out to determine the strength of association between these four select elements. For testing of Hypothesis, Independent t test and ANOVA analysis has been used, where dependent variable is Consumer perception of importance of food packaging and independent

variables are the demographic factors i.e. Age, Gender, Marital Status, Occupation, Educational Qualification, Monthly salary, Amount spent per month on food product. This data has been analyzed by using SPSS 20.0.

Research Hypothesis

H₀₁ : There does not exist significant difference between age and consumer perception towards packaging of food products and beverages.

H₀₂ : There does not exist significant difference between gender and consumer perception towards packaging of food products and beverages.

H₀₃ : There does not exist significant difference between monthly salary and consumer perception towards packaging of food products and beverages.

H₀₄ : There does not exist significant difference between education and consumer perception towards packaging of food products and beverages.

H₀₅ : There does not exist significant difference between marital status and consumer perception towards packaging of food products and beverages.

H₀₆ : There does not exist significant difference between occupation and consumer perception towards packaging of food products and beverages.

H₀₇ : There does not exist significant difference between average amount spent per month and consumer perception towards packaging of food products and beverages.

According to the above table-1, the demographic profile of the sample size indicates that 77% of the respondents lie in the age group 18–25 along with more percentage of males. 60% people have their salary less than 15000, 15% have it between 15000 – 25000, 14% have it between 25000 – 35000 and 11% have their monthly salary above 35000. The profile constituted more of unmarried respondents with maximum percentage of Postgraduate and least percentage of Undergraduate. According to the sample size in the occupation category 72% are student and 28% are working. Maximum respondents spend less than 2500 per month and only 5% spend more than 7500 per month on packaged food products and beverages.

Table-2: Mean analysis used to analyze the factors affecting Food and Beverage Packaging

Factors	N	Mean	Standard deviation
Brand Elements	94	1.9	0.53
Functional Elements	94	2.00	0.52
Informational Elements	94	1.75	0.58
Visual Elements	94	2.95	0.81

According to Table 2, out of the four main select factors affecting food packaging, Informational elements with a mean value of 1.75 is the most important component of packaging element which affects consumer behaviour while making a purchase whereas Visual elements with a mean value of 2.95 affects the least.

Hypothesis Analysis

H₀₁: There does not exist significant difference between gender and consumer perception towards packaging of food products and beverages.

H₀₂ : There does not exist significant difference between marital status and consumer perception

towards packaging of food products and beverages.

H₀₃: There does not exist significant difference between occupation and consumer perception towards packaging of food products and beverages.

Observing Table-3, it is evident that in all the cases significance value is greater than 0.05 that signifies that null hypotheses is accepted. That means there is no significant relationship between gender, marital status, occupation and consumer perception towards packaging of food products and beverages.

H₀₄ : There does not exist significant difference between age and consumer perception towards packaging of food products and beverages.

Table-3: Relationship between gender, marital status, occupation and consumer perception towards packaging of food products and beverages.

Total_fpack_score	Levene's Test For Equality of Variances		T test for Equality of means	
	F value	Sig.	Df	Sig.
Gender	0.441	0.508	92	0.53
Marital Status	0.182	0.671	92	0.89
Occupation	0.767	0.384	92	0.28

H₀₅ : There does not exist significant difference between education and consumer perception towards packaging of food products and beverages.

H₀₆ : There does not exist significant difference between monthly salary and consumer perception

towards packaging of food products and beverages.

H₀₇: There does not exist significant difference between average amount spent per month and consumer perception towards packaging of food products and beverages.

Table-4: ANOVA used to analyze relationship between age, education, monthly salary, average amount spent per month and consumer perception towards packaging of food products and beverages.

Total_fpack_score	F value	Sig.
Age	0.961	0.41
Educational Qualification	0.398	0.67
Monthly Salary	0.530	0.66
Amount spent per month	1.827	0.14

According to the above table, the significance in all the cases is more than value of alpha i.e. 0.05 so null hypothesis is accepted. Again that signifies there is no relationship between age, education, monthly salary,

average amount spent per month and consumer perception towards packaging of food products and beverages.

Table-5: ANOVA is used to analyze the relationship of individual elements of packaging with demographics

Amount_spent	F value	Sig.
Functional element	2.75	.047
Informational element	3.24	.021

When considering individual factors it was observed that Functional element and Informational element shows a significant relationship with the amount spent per month on packaged food and beverage product. The above table depicts their significance since $\alpha < 0.05$.

From the table-6, it was observed that Brand elements showed a medium level association with functional element with Pearson correlation 0.386 (Cohn, 1988)

and a small level association with Informational elements with Pearson correlation 0.260 (Cohn, 1988). Functional elements showed a medium level association with Informational elements with Pearson correlation 0.367 (Cohn, 1988). Informational elements showed a low level association with visual elements Pearson correlation 0.278 (Cohn, 1988) and the relationship is also significant. But visual elements did not show any association with Brand elements and Functional elements.

Table-6: Correlation is used to determine the strength of association between the four select elements.

		Brand Elements	Functional Elements	Informational Elements	Visual Elements
Brand Elements	Pearson Correlation Sig. (2-tailed)	1	.386 .000	.260 .011	.130 .213
Functional Elements	Pearson Correlation Sig. (2-tailed)	.386 .000	1	.367 .000	.175 .091
Informational Elements	Pearson Correlation Sig. (2-tailed)	.260 .011	.367 .000	1	.278 .007
Visual Elements	Pearson Correlation Sig. (2-tailed)	.130 .213	.175 .091	.278 .007	1

Findings

Packaging has a better reach than advertising does, and can set a brand apart from its competitors. It promotes and reinforces the purchase decision not only at the point of purchase, but also every time the product is used. Packaging in different serving sizes can extend a product into new target markets or help to overcome cost barriers. (Mitul M. Deliya & Bhavesh J. Parmar, 2012). Demographic factors when compared with the consumer perceptions of importance of packaging for food and beverage products revealed that they did not show any significant relationship between them. The impact of package and its elements on consumer's purchase decision can be revealed by analyzing the importance of its separate elements. For this purpose main package's elements could be identified as: Brand elements, Functional elements, Informational elements and Visual elements. In Branding elements, brand name influences the most while shaping consumers perception towards food and beverage packaging. In functional elements it was observed that the packaging which keeps the product fresh was most preferred by the consumer. In case of Informational elements, expiry date printed on the label influenced consumer perceptions towards buying the product. In visual elements the packaging colour influenced the consumer's perception the most. Out of all the four elements of food and beverage packaging, informational element was considered the most important by the consumers. When association between these select elements was determined by carrying out correlation study, it was observed that

brand elements showed a significant association with functional and informational elements but did not show any association with visual elements. Functional elements also showed significant association with informational elements but did not show any association with visual elements. Informational element showed a significant association with visual elements.

Conclusion

In today's competitive commercial environment apart from growing concern towards functionality of the packaging i.e. the ability of the package to keep the product safe and easy to transport marketing trends are placing increasing emphasis on the look, sales appeal and quality of retail packaging. The continuously changing demands of consumers will require higher quality graphics and promotional links between graphics and advertising to support brand identities, plus the ability to reflect current consumer trends and images. All the marketing units must pay attention on good packaging. It is necessary to set the packaging standard and to implement accordingly for better protection and promotion of a product. Thus along with keeping a focus on its branding and visual appeal they should also pay attention on the functionality of the packaging so that the food and beverage products remain fresh for a longer time and do not get spoiled and are easy to open and reuse. With growing concern for health, people now a days focus more on the information printed on the labels therefore the marketers should not mislead the consumers and should give accurate information and abide by the Food Safety and Standards Regulations, 2011.

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Consumer Expenditure Behaviour of Households in Rural Haryana: A Decadal Analysis

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Abstract

The present study aims to analyse the Consumer Expenditure Behaviour of Households in Rural Haryana and also investigate the relationship between household income and consumption expenditure. The secondary data, collected from the published reports of NSS 50th-68th round ranging from the period of 1993 to 2012, is used for estimating and analysing the specific objectives of the study. Statistical tools like regression and compound annual growth rate is used to analyse the results. Regression analysis is used to measure the relationship between household income and consumption expenditure in Haryana. Findings revealed that both rural and urban household percentage share of food expenditure is decreasing during the study period on the other hand non-food expenditure is increasing in both rural and urban household. The compound annual growth rate of food expenditure is greater in urban Haryana. But the compound growth rate of non-food expenditure is noticed greater in the rural Haryana. The regression outcome shows that there is a significant relationship between Household Consumption Expenditure and Household Income in Haryana.

Keywords: Per Capita Income, Consumption Expenditure, Regression Analysis, Compound Average Growth Rate, Rural Household

Introduction

India is a rapid developing and agricultural dominant economy which has introduced many changes in the socio economic life of its people since independence. Due to dissimilarities in natural resources endowments; climatic and physical conditions; economic factors like income, prices and the extent of magnetization; demographic factors like degree of urbanization and size of household and cultural factors are probable to impact consumption expenditure pattern. Such various socio-economic, cultural and demographic elements are reflected in the inequality in the distribution of consumption expenditure as it is discovered by the national sample survey

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organization data on consumption expenditure in India (Rao and Saheb, 2012)

Consumption is an important concept in terms of economy and many social sciences. Household consumption expenditures consist of the market prices of all goods and services purchased by households to satisfy their needs and wants. It includes all durable and nondurable goods such as cars, household washing machines, television etc. Household consumption expenditures excludes purchases of residences but includes owner-occupied residences imputed rent (Tapsin and Hepsag, 2014). With the social and economic development of the nation the slight enlargement of basic human needs which a society would expect for its citizen may be likely to keep expanding. These changes in the basic needs of the society may be affordable by the level of income. The level of income of the households ensures the minimum standard of living in the society. The consequence of income is the most important determinant of consumption. Income gives people the ability to pay for motorized transport instead of

walking, to pay for health care and education for their families, to buy miscellaneous, nutritious foods instead of eating only their own crops, to pay for water from a tap instead of walking for many hours to collect it from a well. The increasing dependence of consumption on private income means that changes in income have a dominant influence on changes in consumption. When incomes rise gradually consumption rises for most of the population. But for the same reason, when incomes decline, consumption also falls sharply, with devastating consequences for human wellbeing. The rural households derive their income from various sources like agriculture, wages, livestock, poultry and other self-employed activities. Consumption expenditure and household income are two direct monetary measures used in assessing the economic welfare of a population. However, consumption expenditure is referred to income as it imitates long-term economic status of the household, particularly in low income countries.

This paper makes an effort to throw light on the Consumer Expenditure Behaviour of Rural Household in Haryana. It is organised into eight sections. The next section of the paper discusses a brief review of literature, followed by research gap, objective, hypothesis, Research Methodology, Results and discussion, Conclusion in the subsequent sections.

Review of Literature

Various researches are available relating to the income and consumption of households. Some of the relevant studies are discussed as follows:

Income

Pradhan et al. (2000) evaluated the pattern of income distribution, basic sources of income; consumption pattern and rural urban inequality in India and found that there is a large disparity in rural and urban India. Thakur et al. (2001) analyzed pattern of income distribution and rural poverty of Bihar during 1996-97 and concluded that modern technology of agriculture has not much influence on the income distribution. Janaiah, Bose and Agarwal (2001) analyzed household income distribution and rural

poverty in Chhattisgarh in Madhya Pradesh over the 1996-97 period through regression analysis. The study revealed that income in irrigated area is higher as compared to rain fed area. The major portion of income is derived from land and capital.

Millanovic and Yitzhaki (2002) evaluated the change in world income distribution pattern to find out the wealth of country. Gini measurement has been used to determine the inequality. The study found high disparity in Latin America's country as compared to the other countries of the world. Joshi (2004) evaluated the changes in level of farm income, consumption and investment in rural household Punjab over the 1970 to 2001 period. The study revealed that increased production and income caused by the green revolution have consequence in higher farm household investment and consumption. Millanovic (2005) investigated the effect of direct foreign investment and free trade on income distribution in developed and underdeveloped countries and found that with increase in income, low income countries get benefit from globalization than the poor and middle class countries. Safa (2005) investigated the socio economic factors influencing the small scale agroforestry farms income in hill country areas in Yamen. The study concluded that there income is influenced by area of land, education, family size, and livestock holding. The study also found that the farmers need financial and technical support from government to increase their income. Bala and Sharma (2005) investigated the effect of changing crop pattern on income and employment in Kullu district of Himachal Pradesh over the pre-commercialization (1990-91) and post-commercialization (2002-03). The study concluded that there is additional employment possibility in vegetable crops in the rural area. Income, employment and living standard increased over the period. Paramaiah (2006) investigated the income, consumption and savings pattern of rural farm households in Andhra Pradesh. The study found that the income and household expenditure are steadily higher in the West Godavari district and lowest in the Srikakulam district. Liang (2006) examined the relationship between financial development and income inequality in rural household of China. The result revealed that there was inverse and linear relationship between the finance and income inequality.

Bhakaretal(2007) examined the pattern of income and employment in rural household of Chhattisgarh for the year 2002-2003. The study concluded that kharif crops are the main source of income and employment is mainly generated through non-farm activities. Dachin and Mosora (2012) examined the cross regional disparity of household income in Romania during the period 2000-2008. The study found that the GDP per capita and change in jobs rate are the main impact factors on household income. Tiwari et al. (2013) examined the relationship among the rural urban income inequality and financial development in India during 1965 to 2008. The study found that the rural urban inequality is negatively related to financial development, economic growth and inflation. Naranpanwa et al. (2013) assessed the income distribution of different income groups and estimated the income and poverty inequalities in Shri Lanka. The study found that there is disparity in all income groups.

Consumption Expenditure

Ersado at al. (2000) investigated the household consumption and saving behavior change before and after economic shock in Zimbabwe. The result found that households consume the most of their permanent income and save from their temporary income and they utilize it to smooth consumption. Gangopadhyay and Wadhwa (2004) analyzed the changing consumption expenditure behavior in India during 1983 to 2000. The study found that poverty can be decreased through enhancing the expenditure. Enhancement of per capita total consumption expenditure is reflected in lower portion of necessities become higher with quality of life. Ngullie and Mishra (2009) investigated the structural relationship between income and consumption expenditure of households in Kohima, Nagaland. The study concluded that increase in per capita income of the households brings out structural changes in the pattern of consumption expenditure.

Chudali et al. (2011) investigated the pattern of consumption and compared with the income and employment of people in 5 village in Nepal during 2008-09. The study found that a large change in expenditure of education has been examined in different income groups. Sethi and Pradhn (2012) assessed the consequence of income and occupation

over the expenditure of rural household and found that bulk of household having low states of education are rapid about their importance of their health standards are suggested to replace alcoholic items with nutrition food items. Rao and Saheb (2012) examined the pattern of consumption expenditure in rural household of Guntur district of Andhra Pradesh. The study concluded that socio- economic factors affect the consumption pattern and cultivator household's consumption is highest. Oldiges(2012) examined the relationship between per capita cereal consumption and per capita income in India. The study found that per capita cereal consumption is unrelated to per capita income but it is influenced by other factors.

Research Gap

On the basis of review of literature it is found that various studies are conducted on issues like income distribution pattern, basic source of income, relationship among the rural urban income inequality, factors affecting the income, relationship between income and consumption, pattern of consumption expenditure etc. Somehow income is studied separately. None of the study has been conducted to measure or analyse trend of income of household in India especially at state level. There exist a literature gap in this area. So the current research paper seeks to analyse the Consumer Expenditure Behaviour of Households in Rural Haryana.

Objective

1. To examine the rural and urban consumer expenditure behaviour on food and non-food items in Haryana during 1993-2012.
2. To examine the relationship between consumption expenditure and household income in Haryana during 1993 to 2012.

Hypothesis

H₀: There is no significant difference between urban and rural consumer expenditure behaviour in Haryana.

H₀: There is no significant relationship between household consumption expenditure and household income in Haryana.

Research Methodology

The present study uses secondary data for estimating and analysing the specific objectives of the study. The time series data of estimated per capita consumption expenditure on items and corresponding total consumer expenditure separately for rural and urban households have been taken from the published reports of NSS 50th-68th round. Time period of the study is 1993 to 2012. The statistical data on household consumer expenditure is collected and compiled by the National Sample Survey Organization of India during its various rounds of investigations. The data collected are tabulated and analysed. The tools used for analysis of data are presented and discussed below. Tabular analysis is used to analyse the changes in food and non-food consumption expenditure behaviour. Over years percentage change in Monthly Per Capita Total Expenditure and percentage change in Monthly Per Capita Income shares are worked out for the

income consumption expenditure relation. Compound annual growth rate is estimated as below.

$$CAGR = (V_{t_n} / V_{t_0})^{1/(t_n - t_0)} - 1$$

CAGR= Compound annual growth rate; V_{t_n} = last value; V_{t_0} = start value; t_n = last time period; t_0 = start time period.

Relationship between household income and household consumption expenditure is analysed with the help of Regression Analysis

Regression Equation

$$C_e = a + b_1 X_1$$

a = intercept

C_e = Household Expenditure (food + non-food items)

X_1 = Household income

Results and Discussion

Rural and Urban consumption expenditure behaviour

Table-1: % Share of Rural Food Expenditure and Non- Food Expenditure in Total Expenditure

Years	Rounds	Total Expenditure	Food exp.	% Share	Non-Food exp.	% Share
1993-94	50th	385	231.2	60.05	153.8	39.95
1994-95	51th	396.53	224.9	56.72	171.63	43.28
1995-96	52nd	491.49	273.17	55.58	218.32	44.42
1997	53rd	536.21	306.01	57.07	230.2	42.93
1998	54th	545.96	310.36	56.85	235.6	43.15
1999-2000	55th	714.38	396.55	55.51	317.83	44.49
2000-2001	56th	682.28	360.18	52.79	322.1	47.21
2001-2002	57th	705.77	361.88	51.27	343.89	48.73
2002	58th	702.62	371.37	52.86	331.26	47.15
2004	60th	790.85	421.41	53.29	369.45	46.72
2005	61st	862.89	419.34	48.60	443.55	51.40
2006	62nd	742.65	378.07	50.91	364.58	49.09
2007	63rd	1012.73	480.03	47.40	532.7	52.60
2008	64th	1034.45	517.68	50.04	516.76	49.96
2009-10	66th	1509.91	815.2	53.99	694.71	46.01
2011-12	68th	2176.04	1133.34	52.08	1042.7	47.92

Source: National Sample Survey Organisation

The Table no. 1 shows the percentage share of food items expenditure in total consumption expenditure in rural area. The share of food and non-food in Total Consumption Expenditure was 60.05% and 39.95% in rural Haryana during 1993-94. But the share of food and non-food in total consumption

expenditure was 52.08 %and 47.92% during 2011-12. There is a continued decline in the share of food in total consumption expenditure while the non-food expenditure shows continued increase during the study period (maximum being in year 2005).

Table-2: % Share of Urban Food Expenditure and Non- Food Expenditure in Total Expenditure

Years	Rounds	Food	% Share	Non food	% Share	Total
1993-94	50th	255.3	53.87	218.6	46.13	473.9
1994-95	51th	279.19	57.13	209.53	42.87	488.72
1995-96	52nd	316.65	48.91	330.72	51.09	647.38
1997	53rd	332.08	50.68	323.17	49.32	655.25
1998	54th	306.21	51.85	284.32	48.15	590.53
1999-2000	55th	418.37	45.87	493.7	54.13	912.08
2000-2001	56th	406.74	45.30	491.18	54.70	897.91
2001-2002	57th	426.31	40.99	613.83	59.01	1040.14
2002	58th	449.87	40.05	673.3	59.95	1123.17
2004	60th	502.83	43.88	643.02	56.12	1145.85
2005	61st	472.65	41.38	669.7	58.62	1142.35
2006	62nd	459.07	39.71	696.17	60.22	1156
2007	63rd	526.07	39.37	810.02	60.63	1336.09
2008	64th	639.73	39.31	987.85	60.69	1627.57
2009-10	66th	1001.26	43.13	1320.24	56.87	2321.49
2011-12	68th	1494.72	39.16	2322.62	60.84	3817.33

Source: National Sample Survey Organisation

The above table shows the percentage share of food items expenditure in total consumption expenditure in urban Haryana. Both table 1 and 2 shows that there has been a decline in the share of food in total

consumption expenditure in both urban and rural areas. The proportion of expenditure on non- food items has increased from 46.13% to 60.84% in urban Haryana.

Table-3: Compound Growth Rate of Expenditure on Food and Non- Food Items (1983-2012)

Years	Rural		Urban	
	Food Items (%)	Non-Food Items (%)	Food Items (%)	Non-Food Items (%)
1993-2014	10.44	12.70	11.67	15.91

Source: Researcher calculation

The compound rate of growth of Rural and Urban households' expenditure on non- food items is 12.70% and 15.91% respectively. This table shows that the rate of growth of urban household's food expenditure is greater than growth rate of rural households, reason being of rural migration towards urban areas.

The analysis of the household consumption expenditure.

For urban and rural area of Haryana shows that the rural household's consumption expenditure has smooth behaviour than the urban household's consumption expenditure.

Table-4: Household Income and Consumption Expenditure (1993-2012)

Year	Income (Per Capita)	Total Expenditure (Per Capita)	Yearly Change In Income (%)	Yearly Change In Consumption Expenditure (%)
1993-1994	11079	858.9	-	-
1994-1995	12879	885.25	16.25	3.06
1995-1996	14213	1138.87	10.36	28.64
1997	16611	1191.46	16.87	4.61
1998	17530	1136.49	5.53	-4.61
1999-2000	23222	1626.46	32.47	43.11
2000-2001	25583	1580.19	10.17	-2.84
2002	28022	1745.91	9.53	10.48
2004	34085	1936.7	21.64	10.92
2005	37842	2005.24	11.02	3.53
2006	42133	1898.65	11.34	-5.31
2007	49892	2348.82	18.42	23.71
2008	56917	2662.02	14.08	13.33
2010	82037	3831.4	44.13	43.92
2012	107051	5993.37	30.49	56.42

Source: Researcher calculation

This table indicate the variations of income and consumption expenditure.

Household Income and Consumption Expenditure Relation

Table-5: Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.980 ^a	.960	.957	276.96430	.960	311.528	1	13	.000	1.197

a. Predictors: (Constant), income

b. Dependent Variable: consumption

Model Summary Table provides the R and R² values. The R value represents the simple correlation and is 0.980. The total variation in Consumption

Expenditure as is explained by Income is 96.0% (R²= 0.960), which is very large.

ANOVA^b

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	2.390E7	1	2.390E7	311.528	.000 ^a
Residual	997219.895	13	76709.223		
Total	2.489E7	14			

a. Predictors: (Constant), income

b. Dependent Variable: consumption

As per ANOVA table value of P is 0.000(which is less than 0.05) and therefore significant. Hence regression

model statistically significantly predicts the outcome variable.

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations		
	B	Std. Error	Beta			Zero-order	Partial	Part
1 (Constant)	277.927	123.540		2.250	.042			
income	.048	.003	.980	17.650	.000	.980	.980	.980

a. Dependent Variable: consumption

Coefficient table indicates value of p is less than 0.05 and hence significant. Therefore Null hypothesis is rejected. Hence there is a significant relationship between Household Consumption Expenditure and Household Income in Haryana. The Consumption Expenditure can be predicted from Income through following regression equation.

$$C_e = 277.92 + 0.48 (\text{income})$$

Conclusion

This study highlights the consumer expenditure behaviour on food and non-food items of rural household in Haryana during 1993-2012. The main objectives of this study is to examine the rural and

urban consumer expenditure behaviour on food and non-food and to examine the relationship between consumption expenditure and household income in Haryana during 1993 to 2012. Investigational facts shows that the both rural and urban household % share of food expenditure is decreased during the study period on the other hand non-food expenditure is increased in both rural and urban household. The compound growth rate of food expenditure is detected greater in the urban Haryana than rural. But the compound growth rate of non-food expenditure is noticed greater in the rural Haryana than urban. The regression outcome shows that there is a significant relationship between Household Consumption Expenditure and Household Income in Haryana.

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Managing Social Security of Global Workforce

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Abstract

In the emerging socio-economic environment, the need for social security for the working class can never be over-emphasized. The increasing trends of small and nuclear families, lack of traditional social and family support arrangements and general longevity has placed the requirement of a robust and comprehensive social security system in the forefront. Compounding the gravity of the matter is the globalization of economic activities, specially the service sector. In addition to other factors, the availability of young, English-speaking and highly skilled workforce in some developing countries, ageing population of the developed world and the vast talented workforce in the fields of information technology, health, hospitality etc. in developing countries, are resulted into a noticeable migration of workforce from these developing countries to the developed countries. The conventional social security systems, which have been designed with a view restricted to the national boundaries, have not been able to address the issues and challenges brought up by this changing economic scenario. For instance, the contributions made to the social security schemes of the host country does not convert into any benefit to the employees in case of short term international assignments & projects as the social security systems have been devised for long term service conditions. Hence, the changing socio-economic landscape calls for a change in approach to the conventional social security arrangements. This theoretical study analyses the issues and challenges being faced in reference to the response of the social security systems to the changing scenario. Further an attempt has been made to analyse the steps taken by the governments in the light of challenges being faced.

Keywords: Globalisation, International Worker, Migration of workforce, Pension, Provident Fund, Social Security.

Introduction

In the emerging socio-economic environment, due to the increased complexities of the economic life and almost total breakdown of the traditional social support systems, the need for robust and comprehensive social security systems cannot be overemphasized. In era of globalization, the number of multinational companies is increasing multifold and there is a tendency among these companies to send the professionals abroad from the Headquarters instead of hiring locally. Further the flow of technical knowledge, as a part of various international agreements among countries and multi-national corporations, have lead to movement of domain experts from developed countries to developing countries for specific defined activities. This increases the number of expatriates in the emerging

economies. Similarly it has also been observed that as a result of outsourcing of various activities, especially in Information Technology sector, the developing countries send the IT professionals abroad to handle short duration projects and other short term assignments. As the conventional social security systems have been designed with a view to handle the issues within the national boundaries, these developments have resulted in increasing concerns about the social security of these professionals. The lack of uniformity in social security systems prevailing in each country, lack of totalization of contribution made by the worker may result into less or no social security benefits to the workers.

Thus increase in work force movements beyond the national boundaries calls for the appropriate structural changes in the social security arrangements of almost all the countries. This study is an attempt to highlight the issues and challenges faced on the front of social security arrangements due to globalisation. As India

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represents an economy in the globalised world witnessing the migration of quite significant number of professionals from and into the country, it has been taken as a case study to understand and analyse the issue.

Review of literature

The concept of social security is well reflected in ILO definition. "It can be taken to mean the protection which society provides for its members, through a series of public measures, against the economic and social distress that otherwise would be caused by the stoppage or substantial reduction of earnings resulting from sickness, maternity, employment injury, unemployment, invalidity, old age and death; the provision of medical care, and the provision of subsidies for families with children" (ILO, 1984).

Social security benefits provided by an enterprise should protect not only their employees but also their family members through financial security including health care. Social security envisages that the employees shall be protected against all types of social risks that may cause undue hardships to them in fulfilling their basic needs. It has a great impact on the society at large. It provides access to the health care to the workers and their families regardless of their employment tenure. It is a source of income for the worker and his family when the other sources of income are disrupted.

Within the broad guidelines provided by the social security programmes prevalent in the developed economies, social security systems may vary from country to country depending upon their socio-economic and political conditions. India, being a welfare State, has taken upon itself the responsibilities of extending various benefits of social security and social assistance to its citizens.

The social security package broadly covers two categories of labour welfare measures:- (i) those relating to the medical facilities, compensation benefits and insurance coverage to the employees; (ii) those relating to the provident fund and gratuity provisions. It thus consists of all types of preventive, promotional and protective measures for labour welfare.

A study conducted by Thakur (2010) highlights that maintaining a reasonable standard of living after retirement is an important concern. With the increased mobility of labour, more people are working in more than one country throughout their career. Many workers have undoubtedly benefited from increased opportunities made possible by having access to different employment markets around the world. These increased opportunities have also created the possibility of double social security taxation and impediments to social security benefit entitlement. The coordination of benefits is a significant challenge for countries when it comes to coordination, as benefits contributions, entitlement, resources and even philosophies differ. A study conducted by **Jain and Gujral (2011)** reveals that due to globalisation, many of today's corporate workers are exposed to vivid working contexts in which they are called upon to render their professional expertise and skills. Such working scenarios may vary from working within the country to various overseas locations also on expatriate terms. Stationing at overseas job location for few years is very much in vogue as one of the available options more than ever before. These options quite often push professional career on the fast track. Simultaneously it provides a good opportunity to the constituents for having some international exposure and that too in addition of making some extra bucks. However, the flip side of these circumstances is that quite often the returning professionals are caught in a dilemma of two different employee retirement benefit systems as each country has its own. In the absence of any legal protection on counting their contribution to the retirement benefit system of the countries they worked for; they often end up at the receiving end for no fault of their own.

Objectives Of The Study:

This study encompasses the following objectives

1. To study and understand the issues and challenges in providing social security to the global workforce.
3. To analyse the initiatives adopted by Government of India to provide social security coverage to such workers.

Research Methodology

This is a qualitative research paper. For the purpose of the study, only secondary source of data collection has been used to find out the issues and challenges in providing social security net to the global workforce. Moreover, official websites and annual reports of various government departments have also been referred to gain the insight.

Issues And Challenges

The globalization has changed the world on economic front quite significantly. Economic liberalization has lead to increased interactions among various countries, the cost benefits of developing economies have resulted in more involvement of these economies in world economy leading to their rapid growth and a large pool of young and technically qualified persons in certain countries have witnessed migration of professionals across the world. For instance, India is a major source of migrant professionals due to its vast reservoir of technically qualified manpower in sectors like IT, health, and management etc. and significant movement of Indian professionals in various countries has been witnessed over the period.

Thus globalised economy has given birth to international market place in which the workforce is exposed to an altogether different set of issues. Globalisation has resulted into creation of better opportunities for employment across the boundaries of the nations and also lead to new sets of risks and challenges. One of the major challenges is the social security aspect of this migrant workforce. While a migrant worker, intending to stay in other country for a long period, would get all the benefits in that country at the end of his working life, such professionals, who intend to visit other countries for a short duration for some specific assignments, lose out due to inadequate provisions in the social security systems of these countries. The labour laws in any country are tailored to the customized needs of the people living there and, in most of the cases, have been found inadequate to handle the changed scenario.

The following issues and challenges, which require immediate attention, have cropped up in the changed economic scenario due to globalisation:

- (a) The workforce, when are shifted for the operational reasons beyond their national boundaries, and their employers have to follow the law of the land in the country of their working. Thus the mandatory contributions in compliance to the statute regulating the social security system of the host country are remitted in respect of such employees. In most of the countries, the social security benefits culminate only, and rightly so, at the end of working life or after a minimum qualifying period. As there are no arrangements in place to transfer the funds and other accruals between two countries in such cases, the workforce on return to the home country after short-term assignments and projects have to forfeit the contributions accumulated during their tenure in the country.
- (b) Besides the financial forfeiture, the employees, in such cases, cannot realize the benefits accrued on account of service period in the other countries. Pension benefits, for instance, are not fully availed due to loss of service periods in the other countries as there are no provisions of totalization of service periods. This may also lead to ineligibility of the member for obtaining pension as the member may not have the minimum qualifying service in the absence of totalization his service periods in different countries.
- (c) Another challenge is the different statues defining different sets of coverage and eligibility criteria, contribution structure and retirement benefit plans in different countries. For instance, in India, the coverage in terms of statutory provident fund and pension schemes extends to the employees of the establishments having twenty or more employees, whereas social security coverage includes each and every resident in United States of America. This restricts seamless interaction between the social security systems of different countries.

Initiatives adopted by Government of India

With a view to protect the rights of migrant workers, the Government of India has decided to go for bilateral Social Security Agreements (SSAs) so that the Indian workers are exempted from mandatory social security

contribution in the country of their posting and the benefits of contribution made abroad are received by way of totalization and the payment is received in India. Thus a SSA coordinates the social security schemes of two contracting states in order to overcome the barriers and facilitate extension of benefits to beneficiaries.

A social security agreement, or totalization agreement, is a reciprocal program that prevents double payment to social security systems. Thus, when India signs such an agreement with a country, Indian workers on temporary assignment will not be required to contribute to the social security system there, if they are already contributing to the Employees Provident Fund Organisation (EPFO), a social security organization of Government of India. Similarly, temporary workers from that country on assignment to India would not need to contribute to EPFO if they pay social security taxes in their home country.

Such agreements were entered by India with Belgium, Germany, Sweden and various other countries. The some-pain-no-gain era of double payments by Indian workers on temporary assignments abroad will no longer happen in Germany at least. They will now not be required to pay social security taxes there as the India-Germany Social Security Agreement (SSA) has come into effect recently. In addition to above two countries, the Social Security Agreements have been made effective with six more countries namely Switzerland, Denmark, Luxembourg, France, South Korea and Netherlands till March, 2013. Further, the agreements with six more countries namely Finland, Canada, Japan, Sweden, Austria and Portugal have been signed and are at different stages of implementation.

Need for Social Security Agreements

Indian workers are often posted to foreign countries by their Indian employers on short term contract and during this period they continue to make social security contribution in India as per Indian law. Yet, they are compelled to pay contribution under the host countries legislation too. Moreover, they do not get any benefit from the social security contribution made abroad, because most countries do not allow export

of social security benefit. Most countries also have a minimum contribution period criterion as a result of which if a worker stays abroad for a lesser period, the contribution made is simply lost.

As per the NASSCOM report International Social Security agreements, often called “Totalization Agreements,” have two main purposes. First, they eliminate dual Social Security taxation, the situation that occurs when a worker from one country works in another country and is required to pay Social Security taxes to both countries on the same earnings. Second, the agreements help fill gaps in benefit protection for workers who have divided their careers between India and another country.

Coverage under Social Security Agreements

Totalization agreement generally covers the following benefits:

- Exemption from double social security contribution
- Exportability of Pension to home country or third country
- Totalization of contributory periods for determining eligibility

SSAs protect the interests of Indian professionals by securing exemption from social security contribution in case of short-term contracts (provided the worker is covered under the Indian social security system and continues to pay his contribution to the Indian system during the period of contract). The agreement also helps in exportability of benefits in case of relocation to India or any other country after having made social security contribution during a longer term employment, given the social security system extant in most countries. The agreements also provide for totalization of insurance periods pertaining to both countries for determination of entitlement to benefits.

Benefits of Social Security Agreements

SSAs make Indian companies more competitive since exemption from social security contribution in respect of their employees substantially reduces costs. And ensures employees are appropriately covered for social security needs either at home/ host location. Indian

IT sector is the biggest beneficiary of these agreements because this sector sends large number of skilled resources to work at foreign locations for short durations (less than 5 years). These agreements also enable the totalization of the benefits and the period of service rendered in another country is counted for determining the eligibility for pension.

Conclusion

The evolution of bilateral Social Security Agreements has been a positive step to address the issues and challenges faced by the global workforce in relation to their social security aspects. The coverage in terms

of the number of such countries has been limited and the countries like United States of America and United Kingdom, where maximum number of movement of workforce from India is noticed, have not been covered under these agreements. This calls for a multilateral forum to deliberate upon the possible solutions to a problem with pan-global impact. A multilateral agreement among all the countries not only would ensure the provision of social security to changed nature of the global workforce but also may bring about significant desirable changes in the social security systems of the participating countries resulting in better coverage under such systems.

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Synergy between Women Entrepreneurship and Empowerment

Dr. Archana Sehgal*

Abstract

A synergy is the end result or a potential ability of an individual, an organization or groups, to be more successful or productive as a result of a merger. Discussing the synergy between the women entrepreneurship and empowerment, one needs to be specifically clear about the word "Empowerment" established through the economic independence in general and more precisely through the entrepreneurial ventures. To understand women empowerment, one needs to understand what exactly it means to be 'empowered'. According to many dictionaries the word empowerment suggests the attaining of power or authority over certain issues of large interest and when the women race, supposed to be a suppressed one for centuries, progresses into holding a prominent place in any such issue or the solutions related to it can be addressed as the "Empowerment of Women".

Keywords: Entrepreneurship, Empowerment, Synergy

Introduction

"You can tell the condition of a nation by looking at the status of its women" – Jawahar Lal Nehru as quoted in Sathiabama. K (2010). Once quoted by the first prime minister of independent India, this statement loses its relevance in the current day India, as the condition of a majority of Indian women is not worth mentioning. Women, almost 50% of the world population is empowered & immensely potent race, it depends upon the discretion of a gender recognized more for its emotional power. Quite difficult it is to digest that how slow moving the cultural exchange of the world is when you get to realize that there are several places across India where obnoxious customs of the ancient world co-exist with the latest technologies & thought. However, it may hardly be a surprise for anyone who has been born and brought up in India.

The situation sounds even more alarming when these incidents occur in a state that was being very much headed by a woman Chief Minister till a few months back. India, which is recognized as the fourth most dangerous country in the world for women, has a

variety of violence against women, playing a major role in child rapes; gang adult rapes, acid attacks, domestic violence, dowry deaths, public molestations, to name the few. In the very beginning of civilization, women enjoyed a respectable position in the society at par with men. They largely participated in the social circles and no religious ceremonies were considered complete without the participation of mothers, sisters or wives. Unfortunately their physical constitution became a hindrance in their various achievements, and this led to their dependence on men for food and protection. Alas, the superiority was no longer the fate of the fairer sex which was responsible for carrying forward the life on this planet but became the fate of the male race which had muscle power through which it could subjugate the former. This male dominance led away to a patriarchal society where males wrote the codes for all times and occasions, obviously giving women a subordinate position.

Much has been said and written about the need of women empowerment in general, in the Indian society, and its dependence on the women-entrepreneurship, irrespective of its variety and size, in particular. Keeping this in mind, a literature review is being given, revolving around several articles published in various journals, magazines and web sites at different times in the past.

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Literature Review

According to K.D Gangrade, the empowerment of women, based on Gandhi's vision 'Sarvodaya', should be the ultimate goal. The welfare of women largely depends upon cooperation and trusteeship in the economic sphere, equal participation in the political sphere, and mutual aid in the social sphere without regard to caste, class or gender. Thus, empowerment of the rural and underprivileged women cannot be imposed from above, it must evolve from the bottom.

In brief, empowering women socio-economically through increased awareness of their rights and duties as well as access to resources is decisive step towards greater security for them. Gandhi owes much to Kasturba and even more to his mother for his strong spiritual, social and completely humane bent of mind. His devotion to women began with his devotion to his mother and Kasturba, his wife. Particularly women as mothers became increasingly his idol for liberation of India and his own life. A mother, having brought forth a child, selflessly devotes herself to his care till he grows up and becomes independent. Even after children are grown-up her constant desire is to make herself one with them. Unless we have feelings and devotion for our motherland, many countries will be lying in a wait to crush us down. He told a co-worker, "he saw no hope for India's emancipation while her womanhood remained un-emancipated".

According to Amit K. Dwivedi and Nivedita T. Dwivedi (2011), Women regarded as the fairer sex of the society, confined to the four walls of their homes, dared to come out, broke the walls and started participating in all types of activities including entrepreneurship. In India empowering women through entrepreneurship has become an integral part of our development efforts because of three important reasons;

- i) Women development,
- ii) Economic growth and
- iii) Social stability.

Their paper revolves around a study conducted in Faizabad zone of Uttar-Pradesh. This study deals with the contribution of women-entrepreneurs in economic development of the nation passing through the

multiple sets of problems they face in their entrepreneurial ventures every day. In this study we also get to know that this enterprise is appropriate for those women entrepreneurs who are having problems running in business outside their homes due to family responsibility or their culture, therefore, they can start these ventures inside their homes.

According to Sathiabama. K (2010), the empowerment of women depends upon various factors such as political, social and economic angles of a country. Also, according to the writer, the Self Help Groups (SHGs) have paved the way for economic independence of rural women and have emerged as an important game-changers in the recent times. This article also deals with empowerment of rural women through entrepreneurship and this economic empowerment leading to development of families and communities. This statement is proved by a collective Micro Entrepreneurship in Tamilnadu.

Besides the above written, the discussion about the relationship and synergy between Entrepreneurship and Women Empowerment can be endless, therefore, below is given a list of various writers who have touched the topic in some way or the other, will be an addition to this literature review. Nivedita T. Dwivedi and Tanya Mishra (2013), Birender kumar Jha and Harender Kumar (2009) and report of Regional strategies for empowering women published by Woodrow Wilson International centre for scholars.

Synergy between Entrepreneurship and Empowerment

Today we have endless examples of women entrepreneurs excelling in different walks of life. At one point starting from 70s and 80s and continuing on till today we have 'Shahnaaz Hussain' as India's woman ambassador for 'Herbal Beauty Products', the 90s and 2000s saw the 'Vandana Luthra', 'Bharti Taneja', 'Blossom Kocchar', just to name the few, the women entrepreneurs in the field of beauty products manufacturing. SEWA is another such body which aims at mobilising women in the unorganised sector of the Indian economy. The members of SEWA, a Trade Union, formed in 1972, are self employed women who earn a living through their own business or their own labour. The motto of this union is to

make self-employed women organize themselves into sustainable organizations in order to collectively promote their development

Besides these, the dairy trades and fishery trades are two other such trades which are directly related to the empowerment of women through entrepreneurship. 'Vasundhra Dairy – Valsad registered 1973, is one good example of the women entrepreneurs in the field of dairy products. It is going great guns since its inception till today, empowering hundreds of women in one stroke. On the other hand, the women entrepreneurs in the field of 'Fishery Trade' are also strong examples of economic empowerment of women. Perhaps, this should be the end goal of a road map on women in fisheries and aqua-culture. Women also occupy a very good proportion of the work force in export-oriented processing of cuttle fish, lobsters, and fin fish varieties. Also the fisher women resolve around extension, education, awareness building, training, enhanced adoption level and techno economic empowerment.

Reminded are we of those ancient times when women, in the name of sanskaras, were tied up with the bondage of superstitions, which they had to carry till the last breath of their lives. They were mere objects for physical satisfaction and procreation. According to Hindu Shaastras, a woman was to be a moral slave of her father until married and the same to her husband when married off to him. Unfortunately, all the epigrams, aphorisms, proverbs, platitudes and truism have been a naked truth about the stature of women in India.

It does not mean that efforts have not been made to bring the dignity in the lives of women. There has been a long list of social reformists and saints in our country like Raja Ram Mohan Roy, Ishwar Chand Vidyasagar, Govind Ranade, Jyotibha Phule and to top it all, Dr. B. R. Ambedkar. Dr. Ambedkar laid down the foundation of concrete and sincere efforts by codifying the common civil code for the Hindus and also made all the possible ways of advancement of women in India. Besides this, the Sharda Act is also worth mentioning as it has set the seal of authority upon the scattered pieces of social reforms which were imposed by the heads of orthodoxy.

“If you have to improve a country’s progress then make its women economically independent.” – M.K. Gandhi. Finding a relevant connection to the above said words by the father of the nation many efforts are being done by various organizations, NGOs and other groups to use women empowerment as an effective tool to bring about changes in the women’s socio-economic conditions. Perhaps, their empowerment is associated with their participation in different spheres of life, mainly Education & Economic Independence. The qualified and educated women could otherwise pull their lives in a decent manner, but the question for the less educated and completely illiterate, remained where it was paving way for the birth of “Cottage Industries”, “Laghu Udyogs”, “Cooperative Unions”, “Women NGOs” and so on.

The rising number of women entrepreneurs and their contribution to the national economy is quite visible in India, now-a-days. This number of women entrepreneurs has grown tremendously over a period of time, particularly since 1990s. The women entrepreneurs need to be given credit for their consistent usage of modern technology, more and more investments, finding a niche in the export market and finally being able to create a remarkable employment for others and setting a trend for their sister counterparts and entrepreneurs in the organized sector.

These women entrepreneurs not only are able to create new variety of jobs for themselves and the complete women sect but are also able to provide the society with different solutions to management, business problems and the exploitation of entrepreneurial opportunities. At the same time a fact, much hard to digest, is that these women entrepreneurs were not only able to lower down the participation rates in entrepreneurship than men, but were also able to initiate and maintain various industrial fields where men could not succeed, example being, “papad, badi, beedi, agarbati, pickles, chutney trades, etc.”. Entrepreneurship, as per the popular concept, is a business enterprise where the owner or manager by a risk and initiative taking capacity, aims at making profits.

To quote Birender Kumar Jha & Harender Kumar (2009), “Women comprise half of the human resource, they have been identified as key agents of sustainable development and women’s equality is central to a holistic approach towards establishing new patterns and process of development that are sustainable, “The contribution of women and their role in the family as well as in the economic development and social transformation are pivotal. Women constitute 90 per cent of total marginal workers of the country. Rural women, who are engaged in agriculture, form 78 per cent of all women in regular work”

Currently the economic development is one of the factors in India that changes the entire scenario of social and cultural environment within the country especially for the women. The rural women are engaged in small-scale entrepreneurship programmes with the help of Self Help Groups and play a vital role in farm and home system. They contribute substantially to the physical aspect of farming, livestock management, post harvest and allied activities. Their direct and indirect contribution to the farm and home along with livestock management operations has not only helped to save their assets but has also led to an increase in the family income. In this way, the women are not only empowering themselves technically to cope with the changing times and productively using their free time, but are also engaged in earning individual or collective income with the help of self-help groups. This not only generates income for them but also improves their decision-making capabilities that leads to their overall empowerment, which means that they get enough authority to delegate the roles, and permissions to various people working in collaboration with them to achieve a common profit making goal.

Various Benefits of Entrepreneurship for Rural Women, Leading to Empowerment

Women entrepreneurship is both about women’s position in society and about the role of entrepreneurship in the same society. Women entrepreneurs faced many obstacles specifically in marketing their product (including family responsibilities) that have to be overcome in order to give them access to the same opportunities as those

with men. Particularly the entry of rural women in micro enterprises should be encouraged and maintained. Rural women can do wonders by their effective and competent involvement in entrepreneurial activities as they have the basic indigenous knowledge, skill, potential and resources to establish and manage an enterprise. Below given are some of the qualities seen to be developed as a result of taking up an enterprise among rural women.

- Financial independence
- Better standard of living
- Confidence boosting
- Belief in one’s own self
- Involvement in social and political fields
- More participation in the rural political meetings
- More involvement in solving women related problems

These micro-entrepreneurial efforts for the women empowerment lead to their empowerment in diverse directions such as ‘social equality’, ‘property rights’, ‘political participations’, ‘family and community development’ and ‘socio-economic opportunities’ finally leading to the development of the nation. Women entrepreneur networks are major sources of knowledge about women’s entrepreneurship and they are increasingly recognized as a valuable tool for its development and promotion. This network helps to give lectures, printed material imparting first hand technical knowledge in production, processing, procurement, management and marketing among the other women. This will motivate other rural women to engage in micro entrepreneurship with the right assistance and they can strengthen their capacities besides adding to the family income and national productivity.

Quite encouraging it is for the complete ratio of women in India that the ‘Eleventh Five Year Plan (2007-12)’ has recognized women as not just ‘equal citizens’ but also as ‘agents of economic and social growth’. This plan also speaks about the recognition of the interventions in favour of women to provide them with basic entitlements. All women, according to this plan, should be provided with an environment

free from all forms of violence – physical, economic, social and psychological. The participation and desired representation of women at the highest policy levels and creating gender mainstreaming besides effective policy implementation is also an integral part of this plan.

To re-emphasize that the empowerment of women through entrepreneurship involves an access to resources and markets, actual ownership and active control, these are the three major factors for empowering women. Also to consider their own potential to achieve the desired goals the women should recognize their strengths, weaknesses, opportunities and threats to move forward. In our country, the women entrepreneurs might not necessarily be highly educated but should possess the basic entrepreneurial skills besides the language of market communication. Women entrepreneurship is a process where women are no longer dependent on the males but rather are their own masters providing employment opportunities to other women as well.

Relevance of the Topic

Today's women must supplement the family income using their personal potentials and skills, and if they lack somehow these competencies may be sharpened by required training. Thus, women in India, no longer need to wait for employment outside their homes. They can successfully start their own enterprises and earn a livelihood for themselves. What they need as an effective enterprise manager, is a large quantity of cooperation and encouragement in the sphere of activity at all levels of home, society and also from governmental organizations. Although the traditional image of the entrepreneur has been broken to a certain extent, it is still strong enough for some women to find it hard to be taken seriously, which may have an adverse impact on applications for funding and finding clients. Women's lack of control over resources such as land and labour also limits their eligibility for loans. All said and done, women entrepreneurship has become an important tool for women empowerment in the current-day-India. Women entrepreneurs also enhance the living standards of their family which in turn helps in development of the country. Entrepreneurs are regarded as the backbone of any

economy. Low budget trades and small scale industries like 'Beauty Parlours', 'Manufacturing of Ayurvedic beauty products', 'Aggarbattis', 'Beedi', 'Papad', 'Wadi', 'Lunch Tiffins', 'Pickles and Chutneys', 'Creche' and 'Day Boardings' for kids of working women and many more are the living and healthy examples of women entrepreneurship. These trades are not only flourishing but have a bright future for expansion and absorption of a large numbers of women employees.

Author's Perspective

The promotion of 'Gender Equality' and 'Empowerment of Women' are the goals every country is aiming at. Also these goals are being pursued in all the countries very actively and with a great sense of urgency, for a simple reason that no country is believed to get ahead if half of its citizens are left behind. While seeing our women attain empowerment with a great difficulty through entrepreneurial ventures, we get to understand our women and girls are not just the greatest 'untapped resources' but could be the most 'Powerful Force' for international development. No wonders these women-run small and medium sized entrepreneurial efforts are turning out to be the proven drivers of our GDP. In fine, women-run ventures are a tremendously reliable investment because the money invested and profits earned by them are certainly going to benefit their families and communities because they are more likely to invest in the public betterment than in their sole interests.

Conclusion

Referring to women empowerment in India through entrepreneurship, we need to remember that India as a country is still recovering from years of abuse in the time of the British Raj and it has very recently acquired liberalization through globalization and other socio-economic forces. Undoubtedly when a country will be free from the shackles of social and economic evils, its whole population is destined to benefit, women being no exception. In the words of Swami Vivekanand, "Arise away and stop not until the goal is reached". Thus our country should be catapulted into the horizon of women empowerment and revel in its glory.

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Emotional Intelligence: An Empirical Study of Indian Managers in IT Industry

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Abstract

The present study is an assessment of gender difference in Emotional Intelligence (EI) among Indian managers in IT sector. The study was conducted in major IT hubs of India that include NCR (Noida, Delhi and Gurgaon), Pune & Bangaluru. The Emotional Intelligence (EI) of participants was evaluated through a structured questionnaire based on emotional intelligence competencies. The findings in this research study support the existence of a relationship between gender and emotional intelligence at leadership position.

Keywords: Emotional intelligence, IT industry, Self-awareness, Self-regulation, Motivation, Empathy, Social Skills.

Introduction

The importance of Emotional Intelligence (EI) in the workplace is quite legion. Prior research confirms the association between emotional intelligence and work-related variables (Weisinger, 1998). It is believed emotional intelligence may explain differences in the quality of intrapersonal and interpersonal relationships, contribute to job performance, management effectiveness (Mayer, Caruso & Salovey 2000; Mayer, Salovey & Caruso 2002) and predict success (Goleman 1995, 1998a, 1998b, 2000). Further it is found that EI, compared to Intelligence Quotient (IQ), has a more significant effect on individual performance (Dulewicz & Higgs, 1999). The above mention studies has been conducted in various sectors of business as retailing, services, hospitality, tourism, manufacturing, medical profession etc (e.g. Barling et al., 2000; Palmer et al., 2002; Gardner and Stough, 2002; Sivanathan and Fekken, 2002). However importance, role and applications of emotional intelligence in IT industry are still unexplored. The present research study is an attempt to assess the gender difference at leadership position in Indian IT industry, where technical skills are still considered as paramount for any leader to be successful.

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Emotional Intelligence

“Emotional intelligence” (EI) refers to emotional awareness and emotional management skills, which provide the ability to balance emotion and a reason to maximize productivity and happiness. Emotional intelligence has its roots in the concept of “social intelligence” that was first identified by Thorndike in 1920 however the term EI was coined by Psychologists Peter Salovey and John Mayer in year 1990. But it was Daniel Goleman (1995) who popularized the concept with his book “Emotional Intelligence Why It Can Matter More Than IQ (1995) and as a result of that both practicing managers and academia have started believing in its importance in the organization. Denial Goleman (1995) describes EI as “abilities such as being able to motivate oneself and persist in the face of frustrations; to control impulse and delay gratification; to regulate one’s moods and keep distress from swamping the ability to think; to empathize and to hope.” Goleman (1998a,1998b) further identified the five elements as the components of emotional intelligence: Self-awareness, Self-regulation, Motivation, Empathy and Social Skills, he grouped them as Emotional competencies. These five essential components of emotional intelligence and the competencies based on these abilities are crucial for success in personal, social and professional life. A brief description of them is given in Table 1.

Table-1: Goleman's (1998) Emotional Intelligence Competencies

EI Competencies	Definition	Corresponding Attributes
Self-awareness	The ability to recognize and understand one's moods, emotions and drives as well as the effect on others	Self-confidence; realistic; self-assessment; self-depreciating sense of humor
Self-regulation	The ability to control and redirect impulses and moods. The propensity to suspend judgment - to think before acting	Trustworthiness and integrity; comfort with ambiguity; openness to change
Motivation	A passion to work for reasons that go beyond money or status. A propensity to pursue goals with energy and enthusiasm.	Strong drive to achieve optimism; even in the face of failure; organizational commitment.
Empathy	Ability in managing meaningful relationships and building networks; Skills in treating people according to their emotional reactions.	Expertise in building and retaining talent; cross-cultural sensitivity; service to clients and customers.
Social skill	Proficiency in managing relationships and building networks. An ability to find common ground and support	Effectiveness in leading change; persuasiveness; expertise in building and leading teams

Above mentioned EI Competencies have been considered for calculation of EI score in present study.

Gender Difference

Gender difference has always been considered important in organizational behavior researches. Since the popularization of emotional intelligence in business arena over the past decades, researchers have been studying about gender differences in terms of emotional intelligence as women are joining the workforce more day by day and are contributing to the economy of the country so the differentiating aspects of the male and female workers have gained considerable attention from researchers worldwide. There are many points of views given by the researchers regarding gender differences as the male and female are physically and mentally different from one another so they have the differences relating to work and managing emotions. It has been affirmed that women tend to be more emotionally expressive than men, that they understand emotions better and that they have a greater ability as regards certain interpersonal skills for example strong relationship have been found between the emotional intelligence and the performance of female employees (Higgs 2004), though female gender, and boundary role

responsibilities were not found to be statistically significant (Dimitrides 2007), it is also reported that female employees recognize other people's emotions better, are more perceptive and have greater empathy (Hargie et al 1995; Lafferty 2004; Tapia and Marsh 2006; Trobst et al 1994), another research says that women are generally more aware of their emotions, show more empathy and are more adept interpersonally though both males and females generally have equivalent abilities to develop their emotional intelligence (Fatt 2002). On other hand no significant difference was reported in the male and female leaders with respect to the social and emotional intelligence leadership roles (Hopkins & Bilimoria 2007).

Leadership, Emotional Intelligence and Gender Difference

The literature on emotional intelligence is replete with studies on association between leadership and EI. So much research has been done to establish a relationship between leadership and EI. An increasing number of researchers have argued that emotional intelligence is a core variable that affects the performance of leaders (Goleman 1998a, 2000; Wong and Law 2002).

Further a considerable body of research concludes that there are differences between male and female leaders as the female leaders demonstrate emotional and social intelligence to a greater degree than male leaders. Female leaders are also shown better progress than their counterparts on measures of emotional and social intelligence (Boyatizs and Sala 2004; Schutte et al 1998). Further certain qualities like the decision making power, the courage, the view of power in rational terms, encouraging the conflict resolution and the development of team work oriented environment etc.; have been identified as the female leadership qualities (Helgeson 1990; Rosener 1990). In another research finding, Rutherford has reported that women leaders have better people skills than men (Rutherford 2001). On other hand certain researches explain that there are no significant differences in the behavior of the male and female leaders (Maher 1997; Powell 1990; Vilkinas and Cartan 1993). Hence in the light

of literature reviewed above following hypothesis (null) was set to be explored.

H_0 : There is no difference in Emotional Intelligence of Male and Female Managers in Indian IT industry.

Methodology

Present section explains research methodology adopted for present study.

Sample

A sample of total 145 respondents was utilized. Sample consists of employees working as managers in different IT companies in NCR (Delhi, Noida and Gurgaon), Pune and Bangaluru. A structured questionnaire was administered to the respondents. Out of the total sample of 145 respondents, 86 were male while 59 were female managers. Further Given below are the details of respondents on the basis of region they belong.

Table- 2: Distribution of Respondents (Region Wise)

Region	Gender	Number of Respondents	Total
NCR (North)	Male	35	58
	Female	23	
PUNE (West)	Male	26	42
	Female	16	
BANGALURU (South)	Male	25	45
	Female	20	
		Total	145

Sampling Technique

NCR, Pune and Bangaluru in India are considered as favorite destinations among IT companies. Together they are host to more than 100 fortune 500 companies. There are several Special Economic Zones (SEZ) commonly known as IT parks in these three major IT hubs. Data was collected from these three cities in present study. Total 9 companies were covered for present study. On the basis of area sampling, first IT firms were divided into areas, based on geographical location of IT companies and based upon random sampling IT companies were selected for present study. Data from Individual respondent was collected through convenience sampling in each area.

Data Collection Instrument

Data for present study was collected by a well-defined structured questionnaire. The Questionnaire was drafted on the basis of Daniel Goleman's (1995, 1998) parameters of Emotional Intelligence. The main items included were Self-Awareness, Self-Regulation, Self-Motivation, Empathy and Social Skills. The questionnaire had two sections, section one aimed to cover demographic variables, while section two aimed to check emotional intelligence level of respondent. Section two of questionnaire had 40 items related to emotional intelligence, rated at five point Likert scale, having 1 = strongly disagree to 5 = strongly agree and 3= undecided. The higher score represented higher emotional intelligence.

Table-3: Reliability Statistics for Scales

Name of Subscale	Reliability Statistics (Cronbach's Alpha)	No. of Items
Self –Awareness	0.851	8
Self-Regulation	0.740	8
Self-Motivation	0.729	8
Empathy	0.745	8
Social Skills	0.848	8
Overall Questionnaire	0.801	40

Reliability of the Questionnaire

The reliability of scales was assessed using Cronbach's Alpha. It may be mentioned that its value varies from 0 to 1 but, satisfactory value is required to be more than 0.6 for the scale to be reliable (Cronbach, Lee J. and Richard J. 2004). In the present study the Cronbach's alpha reliability coefficient has been checked of overall questionnaire as well as of subscales too as given in table3.

The questionnaire had an overall score of Cronbach's Alpha (0.801) and its 5 sub-scales range from 0.729 to 0.851. These results indicate that the instrument has a high internal consistency and is reliable for further use.

Data Analysis and Results

Data collected was coded, transformed, entered and checked for data entry errors prior to analysis. Data analysis was completed with the help of SPSS. Independent sample t-test was applied to examine whether the difference in EI scores of female and male respondents in the current study was statistically significant or not. The test was applied on overall EI Score as well on each EI parameters too. Table 4 shows the results of independent samples t-test regarding influence of gender on EI and its parameters.

Table-4: Results Independent Sample t-test

Parameter	Male(N=86)		Female(N= 59)		Mean Difference	t-value	p-value
	Mean	Standard Deviation	Mean	Standard Deviation			
Self-Awareness	24.2000	4.7266	28.5217	2.7776	-4.32174	3.952	.000**
Self-Regulation	25.7714	3.3875	28.0435	3.6366	-2.27205	2.427	.018*
Self-Motivation	26.1143	4.5488	28.4783	2.6435	-2.36398	2.251	.028*
Empathy	24.3429	4.4321	26.5217	3.0431	-2.17888	2.058	.044*
Social Skills	26.1143	4.1071	28.7391	2.5622	-2.62484	2.731	.008**
Total EI Score	130.23	11.7400	138.57	12.1910	-8.33665	2.606	.012*

** Significant at 0.01 Level

* Significant at 0.05 Level

Table-5: Results Independent Sample t-test (Region-wise Comparison)

Region	Category	N	Mean	Standard Deviation	Mean Difference	t-value	p-value
North (NCR)	Male	25	131.47	14.1936	6.75	3.113	.002**
	Female	20	124.72	11.3317			
West (Pune)	Male	26	130.39	12.9285	-1.05	0.441	.660
	Female	16	131.44	13.5489			
South (Bangaluru)	Male	35	145.70	6.8303	4.57	2.315	.023*
	Female	23	141.13	14.7824			

** Significant at 0.01 Level

* Significant at 0.05 Level

Observations from table 4 reveal that not only in overall score of EI but in all parameters significant differences existed, female respondents scored higher than their male counterparts. The maximum difference was found in self-awareness parameter (4.32174) while minimum was in the parameter of empathy (1.503) while in overall EI score the difference is 8.33665 favoring female respondents. These findings taken together indicate that female respondents, on an average, were more emotionally intelligent-capable.

Further on utilizing independent samples t-test, it is clear from results that the significance value (p-value) is < 0.050 for all the parameters, they range from .000 to .044 and for total EI Score it is .012 these all value are less than set criteria of being statistically significant i.e. for being significant p value should be <.05. However for self-awareness it is 0.000 while for empathy it is .044 which is close to set criteria. Thus the results of Independent sample t-test revealed a statistically reliable difference between the mean EI scores of overall Male and Female respondents not only in total EI score (t = 2.606, p = .012, α = .05) but in each parameter too (refer table 4), These t-test results support the rejection of null hypothesis.

Further region wise comparison was done in order to find out if there exist any differences in the mean EI score of male and female managers in the data set of NCR, Pune and Bangaluru. Results are given in table 5.

Findings show that there is a difference in the mean EI scores of the respondents from NCR and Bangaluru (6.75 and 4.57 respectively) favoring female respondents. However in the data set of Pune, male respondents scored higher than their counterpart, the difference is 1.05 favoring male respondents. Also the results of t-test are mixed in nature as they show statistically reliable difference in EI score of male and female respondents in the data set of NCR and Bangaluru (p value is .002 and .023 respectively) while results show no difference in the data set of Pune (as p value is .660). The same is clear from Table 5 also as in data set of Pune, male scored higher than female respondents though the difference was marginal (1.05). However findings t-test of overall respondents and total score of EI encourage the rejection of null hypothesis. Hence in the light of above findings null hypothesis is rejected.

Discussion and Conclusion

The purpose of current research was to examine gender differences in emotional intelligence (EI) as well as in

Hypothesis Test Summary(H₀)

Null Hypothesis	Test	Significance	Decision
H ₀ : There is no difference in Emotional Intelligence of Male and Female managers in Indian IT industry.	Independent sample t-test	.012 (for overall EI score)	Reject the null hypothesis.

EI competencies and the findings of study say that there is a difference between the male and female managers with respect to EI in Indian IT organizations. These findings support earlier studies conducted by Sutarso (1999), Wing and Love (2001) and Srivastava, K. B. and Bharamanaikar, S.R. (2004). They all revealed that women have higher level of emotional intelligence than men. These results are also in line with the work of Hopkins (2004) who concluded that women leaders demonstrate a broad range of emotional competencies in comparison to male leaders and with Rutherford who reported that women leaders have better people skills than men (Rutherford 2001), in present study too female managers have scored higher on social skills in comparison to their counterparts. Further Mandell and Pherwani (2003) affirmed the gender differences between males and females in emotional intelligence

score (using ECI). One reason of such findings could be that women react with stronger emotions than men under similar circumstances (Bradley, Codispoti, Sabatinelli, & Lang, 2001; Fujita, Diener, & Sandvik, 1991) and they recognize more emotions in comparison to their counterpart (Grossman & Wood, 1993). It may also be argued that women are more interested than men are in emotional relationship, problems & issues, and share those interests with other women. Subsequently they develop skills and knowledge related to emotional life. The present study fills a gap in existing body of knowledge as role and application of EI has not yet been explored in Indian IT industry. Its findings reveal importance of EI for IT managers however there is a difference in terms of gender. It suggests organizations must adopt EI as part of their training & development policy to bridge this gap.

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Facilitating E-Learning through Mobile Ad Hoc Networks

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Abstract

The rapid and accelerating move towards the adoption and use of mobile technologies has increasingly provided students and teachers with the ability to study away from the classroom and on the move. Wireless and mobile technologies influence the evolution of current e-learning use and press forward the development of new mode of education enabling any time, anywhere and anyhow learning. New wireless technologies can be used to boost interactivity, thus helping create community, as people remain online even while going about their business. The use of wireless technology paves the way for a literal interpretation of mobile ubiquitous computing. People can get online, be reached, and interact anywhere and anytime. In this paper, we discuss a platform based on wireless technologies to support learning communities in university campuses and how it could be used to improve ubiquitous interactivity and cooperation among teachers and students. The requirements of modern e-learning techniques change. Aspects such as community interaction, flexibility, pervasive learning and increasing mobility in communication habits become more important. To meet these challenges e-learning platforms must provide support on mobile learning. Most approaches try to adopt centralized and static e-learning mechanisms to mobile devices. However, often technically it is not possible for all kinds of devices to be connected to a central server. Therefore we introduce an application of a mobile e-learning network which operates totally decentralized with the help of underlying ad hoc network architecture.

Keywords: MANET, learning community; wireless technologies; mobile and ubiquitous computing. Mobile learning, ad hoc learning, community, e-learning platform, ad hoc messaging network, pervasive learning

Introduction

In computer networking, an ad hoc network refers to a network connection established for a single session and does not require a router or a wireless base station. Basically, an ad hoc network is a temporary network connection created for a specific purpose (such as transferring data from one computer to another) [Tanenbaum, A. 2003]. A MANET (Mobile Ad hoc NETwork) is a type of ad hoc network that can change locations and configure itself on the fly. Because MANETS are mobile, they use wireless connections to connect to various networks. This can be a standard Wi-Fi connection, or another medium, such as a cellular or satellite transmission. Some MANETS are restricted to a local area of wireless devices (such as a group of laptop computers), while others may be

connected to the Internet [M. Berger und M. Watzke 2001]. For example, A VANET (Vehicular Ad Hoc Network) is a type of MANET that allows vehicles to communicate with roadside equipment. While the vehicles may not have a direct Internet connection, the wireless roadside equipment may be connected to the Internet, allowing data from the vehicles to be sent over the Internet. The vehicle data may be used to measure traffic conditions or keep track of trucking fleets. Because of the dynamic nature of MANETS, they are typically not very secure, so it is important to be cautious what data is sent over a MANET. Mobile ad-hoc networks are characterized by spontaneously connecting systems using wireless technologies. Such networks have inherently high dynamics, because mobile terminals can randomly enter or leave the reachability scope at any time. Besides the dynamic changes in the infrastructure itself, there are also dynamic changes in provided services, content and reachable users within the ad-hoc network.

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With the vast development of various technologies, learning today is no longer confined in classrooms with lecture as the only method for conveying knowledge. E-learning, which facilitates education using a network, has made learning possible from anywhere at any time by using the Internet, wide area networks, or local area networks. Specially, mobile learning even allows people to learn on the move using portable devices, such as cell phones, personal digital assistants (PDAs), or laptops.

Motivation For Research

More and more people are equipped with more or less powerful mobile computers, ranging from cell phones to laptops. Over the last couple of years, research on ad-hoc networks as a means to provide technical integration of these devices has attracted a lot of attention. An ad-hoc network is a dynamic collection of mobile devices that are connected without a fixed infrastructure. In single hop ad-hoc networks, all the devices are within radio range of each other and can communicate directly. Usually, however, interesting resources and services are spread across a wider range. What is needed then, are multi-hop ad-hoc networks, where devices can communicate with one another by "routing" information through intermediate nodes. They now become themselves part of the infrastructure. In particular, the nodes have to act as routers if needed. So far, the technical side of ad-hoc networks has received much attention from the research community. For example, they may wish to share the information available in a network. This integrated usage of resources is quite common in fixed networks and even in infrastructure-based wireless networks. There exist a lot of concepts and mechanisms to support integrated access to shared resources. Very little has been done in the rather new research field of ad-hoc networks. Moreover, there is no straightforward adaptation of the existing solutions to networks that change their structure dynamically and have no dedicated components for building an infrastructure. It should be quite obvious that support for information sharing (or more generally for resource sharing) is needed, if these networks are to be widely used [www.ellinogermaniki.gr/ep/ad-hoc]. Therefore in this paper, we develop concepts to use the resources of an

ad-hoc net in an integrated, effective and efficient way. Resources are shared by offering services that allow access to them. Our special interest lies on services offering access to information. These services can be viewed as a large, highly heterogeneous, distributed information system with autonomous component systems. Our goal is to support the effective and efficient usage of these resources. On the one hand, mechanisms to use the provided resources *effectively* assure that the resources yield the desired results, i.e. that the services we find and use do what we expect them to do. On the other hand, mechanisms to use the resources *efficiently* help to gain the results in a resource-aware manner, i.e. with as little resource consumption as possible. Another major contributor to the changing face of e learning is Web 2.0[<http://www.ietf.org/html.charters/manet-charter.html>]. Educators began to notice something different happening when they began to use tools like wikis and blogs in the classroom. All of a sudden, instead of discussing pre-assigned topics with their classmates, students found themselves discussing a wide range of topics with peers worldwide. In a very short time, blogs were used for a wide variety of purposes in education; an educational bloggers' network formed and thousands of teachers were encouraging their students to blog.

New Challenges In E-learning

E-learning is of an increasing importance in modern education systems. Therefore, methods and content of e learning changes and sets new challenges for technical and social tasks. New aspects arise of how people deal with information, how they expect to be provided with content and in what situations and places they want to learn. Furthermore community learning is a new approach and focuses on interaction aspects between people. Modern e-learning platforms have to reflect on these new challenges [J. Fleischman 2001]. Our approach is to focus on different applications for e-learning solutions to meet these challenges. One of the most important strategies for mobile e-learning is to focus on ubiquitous learning, communication in dialogues, and connectivity to meet the arising community aspects of learning platforms.

Learning is not bound to courses, time, and places. Many situations during a day can be seen as individual

learning environments. The term 'ubiquitous learning' describes learning environments as they are: pervasive and omnipresent. Combining pervasive learning and mobile learning will bring up ubiquitous learning.

Knowledge gains takes place in close interaction among members of social networks. That can be in a common teaching environment such as a course, a group of friends that share the same interests or just in transient everyday situations [C. Fuch, S. Stieglitz, and O. Hillmann, 2006]. As a personal learning experience former foreign knowledge is added to ones own knowledge repository. This knowledge content represents potential learning items for other participants of the learning group or course. As knowledge is not a rare resource, knowledge can easily be shared among members in a social group. Thus gaining of knowledge in groups is not only profitable for one member but also for other members or for the whole group. Networks effects become important and accelerate the learning process.

Using mobile devices can support the broadcasting of experiences to a larger group. The messages may be time shifted but still the content is shared. Therefore the devices must offer various interfaces for different situation to be capable of the exchange of parts of knowledge repository anytime and in any situation. In order to make content on various devices accessible for end users, a unified communication service platform must be introduced. Message sharing should rely on standard interfaces and should be transparent to the applications that end users operate with.

Implementation Of Manets For Elearning

The vision of mobile computing is that of portable computation with rich interactivity, total connectivity, and powerful processing. This small device is always networked, allowing easy input through pens and/or speech or even a keyboard when necessary (though it may be something completely different like a chord keyboard), and the ability to see high resolution images and hear quality sound. It may be that the image is overlaid on the world through glasses that act like a Heads up Display. Mobile learning can be considered from two viewpoints, the first one is technical oriented perspective regard traditional behaviouristic educational paradigm as given and tries to represent

or to support them with mobile technologies. A main concern from this perspective is how to create, enrich, distribute and display learning material on mobile devices; the main benefits are to personalize the way of learning (where you want, when you want, what you want, as fast as you want, how you want; etc). The second one is pedagogical socio-cognitive and distributed cognition paradigms [Yu-Han Chang, 2004]. In this viewpoint we face traditional designs of teaching and learning to push community oriented learning like collaborative learning, problem based learning; informal and ad-hoc learning, etc.

Most of e-learning arrangements focus on individual learning experiences. Participants are able to choose time and place where they want to precede the lessons. However, even in traditional leaning arrangements, where learning takes place in courses and leaning groups, knowledge is spread among the group members and the net outcome, respectively the resulted knowledge gain for the group is greater than the sum of the individual gains due to network effects. E-learning may not reject those advantages and concentrate on community aspects as well. Tools that support knowledge management in learning communities can be internet or intranet portals, wiki installations, forum software, classical online learning platforms, or other web 2.0 applications. The success of these applications, especially wikis and forums, strongly depends on network effects. The benefit for every single user who is contributing in such a community rises with the amount of members and the amount of postings. Usually, in common learning environments there is a limited number of participants [Chang, C.Y., Sheu, J.P., Chan, T.W., 2003]. Therefore, network effects could hardly be realized. In many situations the need of being connected to a central server is a limiting factor for the growth of an e learning community. Thus it is necessary to provide a network platform that can be used by members anywhere and anytime without the need of being connected to a central server. Most important is the way of communication that is used among participants sharing content without a continuous connection to the central repository. Mechanisms of ad hoc networking are used for off-course knowledge distribution.

E-learning Scenario in a University Campus

In order to see how e learning works in an ad hoc network, we would set up an imaginary MANET of a university campus. A MANET consists of autonomous mobile nodes that are free to roam arbitrarily with no centralized controller such as router to determine the communication paths [Royer, E., Chai Keong Toh, 1999]. Each node in the ad hoc network has to rely on each other in order to forward packets. This kind of nature of MANET requires mobile nodes to have good cooperation with each other to ensure that the initiated data transmission process is a success. This network is independent of any fixed infrastructure or centralized administration. A node communicates directly with nodes within its wireless communication range. Nodes that are part of the MANET, but beyond each other's wireless range communicate using a multi-hop route through other nodes in the network. These multi-hop routes change with the network topology and are determined using a routing protocol. A node in an IP-based network is configured with an IP address, a net-mask and a default gateway (the node to which packets for destinations not having an explicit entry in the routing table are sent). In a MANET, nodes should be able to enter and leave the network at will. Thus, the nodes should be capable of being dynamically configured by the network upon their entry into it. It may be argued that MANET nodes also belong to some home network, and could continue to use their home network IP address in the MANET. However, in several instances a node does not permanently own an IP address: an IP address is assigned to the node when it boots up, and the node releases it on leaving the network.

For example user1, is a computer science student. She is currently preparing for her exam on "Information Systems". This exam covers several topic areas like "Software Engineering", "DBMS", "Computer Networks", and so on. At a particular time, she is at the campus cafeteria. She has brought her PDA along so that she can continue working. Before leaving home, she has downloaded the PowerPoint slides describing the two-phase commit protocol onto her PDA. After working through a few slides, she comes across an annotation mentioning a paper that explains

a specific aspect in more detail. User1 tells her PDA that it should try to locate the paper somewhere and download it. User1 PDA is not connected to a fixed network. However, her PDA forms an ad-hoc network together with other nearby computers. Some of these computers (or rather their users) will have similar interests as User1 and might thus be able to provide the required information. Eventually User1 PDA finds another computer that not only possesses the paper in question but is also willing to allow downloading it. User1 works through the paper and then returns to the original slides. Even after going through all of them, she is not sure that she has quite understood what 2PC is all about and feels that an example would greatly help her understanding. She asks the PDA to look for an example. It reports that the introductory course on database management provides just that. The PDA also determines that while none of the computers currently participating in the ad-hoc network has stored the example, a computer that offers access to the fixed network has just joined. User1's PDA uses this computer's network connection to retrieve the example.

Let us now take a look at the requirements that need to be met in order to offer the desired functionality. Obviously, we need a possibility to spontaneously network any computers without having to rely on a fixed infrastructure. Thus, the technical basis of the system should be formed by an ad-hoc network. However, this technical basis alone is not sufficient to efficiently use the network. Additional functionality is needed that allows finding and using resources in the network. In particular, concepts are needed to address the following topics:

- Service description. Services need to be described so that they can be found automatically. In order to achieve this, a merely syntactic description of the service interface is not sufficient.
- Representation of the user context. The current context of the user, e.g. her location, the computer she is using and the state it is in, her interests and so on, plays an important role in determining which services are suitable to address her needs.
- Service discovery. In ad-hoc networks, the set of services that is available at any given time cannot be predetermined to be static, as the participating

computers change frequently. Thus, a mechanism is needed that helps users to find the services they need.

- Efficient usage of services. Depending on the current structure of the network and the state of the computers that form it, strategies for efficient usage of services need to be developed.
- Integration of services. Often, one service alone will not be able to answer a user request. What is needed is rather a combination of different services that together offer the required functionality.
- Motivation to offer services. The network needs to offer some kind of incentive to participating computers to offer services. An appropriate means has to be devised.

The basic building blocks of our solution are services. A wide range of different services will be offered and used by the participants in our ad-hoc network. Services are described by service descriptions based on the developing standards in this area. These descriptions are used for a service discovery mechanism. Since ad-hoc networks do not possess any infrastructure components of their own, service discovery needs to be organized in a distributed fashion by the participating nodes. Once services have been discovered they should be used efficiently and effectively in a resource-aware manner.

Advantages of Mobile Learning

The most obvious advantage of a learning environment is the ability to access information where it would not be possible without a mobile device. Mobile devices belong to a learner's personal sphere [Wenger, E., R. McDermott, and W. M. Snyder, 2002]. This means the learner can take learning opportunities directly in the situation where they occur, because he has his learning environment always at hand. Mobile learning, offers the possibility to arrange learning settings flexibly and spontaneously, helps organizational skills, encourage a sense of responsibility, helps both independent and collaborative learning, and can be used to help track students' progress and for assessment. Students and teacher can jump from an individual work, to a group work, to a classroom work, they can also change place

without modifying the material. The Ad Hoc system will fulfill the following general requirements:

- Interactivity: It should provide means of communication between learners and teachers. It should allow for feedback by the teachers that will be accessible to learners.
- Interdisciplinary: Content should be presented in an interdisciplinary way incorporating information of different disciplines, thus promoting the idea of informal learning.
- Unobtrusiveness: So that the student can capture situations and retrieve knowledge without technology obtruding on the situation.
- Availability: Its functions should be available anywhere and it should provide seamless communication inside and outside buildings.
- Adaptability: It should adapt to the learners' evolving skills and knowledge.
- Usefulness: It should be suited to everyday needs for communication, reference, and learning
- Suitability: Content should be corresponding to specific learning needs of users, e.g. content for the same subject should be presented in several ways and provided according to the specific users' profile;
- Easy to use: It should be intuitively easy to use, by users with no computer experience.

The increased requirement to maintain a competitive advantage in the global economy has resulted in deliberate personal learning. This potential is likely to increase as the information age accelerates. People will need to be able access information faster and more effectively if they are to increase their employability, business success, personal fulfillment and social development. Mobile Learning provides people with the opportunity to access information where it would previously have been impossible. This access advantage is not limited to time and location. The devices required to access mobile networks are relatively inexpensive compared to desktop or laptop computers. This reduced expense can make access to this learning available to people who otherwise could not afford it.

Ad Hoc Networking Issues

In general, mobile ad hoc networks are formed dynamically by an autonomous system of mobile nodes that are connected via wireless links without using the existing network infrastructure or centralized administration. The nodes are free to move randomly and organize themselves arbitrarily; thus, the networks wireless topology may change rapidly and unpredictably. Such a network may operate in a standalone fashion, or may be connected to the larger Internet. Mobile ad hoc networks are infrastructure-less networks since they do not require any fixed infrastructure, such as a base station, for their operation. In general, routes between nodes in an ad hoc network may include multiple hops, and hence it is appropriate to call such networks as “multi-hop wireless ad hoc networks”. Each node will be able to communicate directly with any other node that resides within its transmission range. For communicating with nodes that reside beyond this range, the node needs to use intermediate nodes to relay the messages hop by hop. The ad hoc networks flexibility and convenience do come at a price. Ad hoc wireless networks inherit the traditional problems of wireless communications and wireless networking:

- the wireless medium has neither absolute, nor readily observable boundaries outside of which stations are known to be unable to receive network frames;
- the channel is unprotected from outside signals;
- the wireless medium is significantly less reliable than wired media;
- the channel has time-varying and asymmetric propagation properties;
- Hidden-terminal and exposed-terminal phenomena may occur.

To these problems and complexities, the multihop nature, and the lack of fixed infrastructure add a number of characteristics, complexities, and design constraints that are specific to ad hoc networking:

- *Autonomous and infrastructure-less*: MANET does not depend on any established infrastructure or centralized administration. Each node operates

in distributed peer-to-peer mode, acts as an independent router and generates independent data. Network management has to be distributed across different nodes, which brings added difficulty in fault detection and management.

- *Multi-hop routing*: No default router available, every node acts as a router and forwards each others packets to enable information sharing between mobile hosts.
- *Dynamically changing network topologies*: In mobile ad hoc networks, because nodes can move arbitrarily, the network topology, which is typically multi-hop, can change frequently and unpredictably, resulting in route changes, frequent network partitions, and possibly packet losses.
- *Variation in link and node capabilities*: Each node may be equipped with one or more radio interfaces that have varying transmission/receiving capabilities and operate across different frequency bands. This heterogeneity in node radio capabilities can result in possibly asymmetric links. In addition, each mobile node might have a different software/hardware configuration, resulting in variability in processing capabilities. Designing network protocols and algorithms for this heterogeneous network can be complex, requiring dynamic adaptation to the changing conditions (power and channel conditions, traffic load/distribution variations, congestion, etc.).
- *Energy constrained operation*: Because batteries carried by each mobile node have limited power supply, processing power is limited, which in turn limits services and applications that can be supported by each node. This becomes a bigger issue in mobile ad hoc networks because, as each node is acting as both an end system and a router at the same time, additional energy is required to forward packets from other nodes.
- *Network scalability*: Currently, popular network management algorithms were mostly designed to work on fixed or relatively small wireless networks. Many mobile ad hoc network applications involve large networks with tens of thousands of nodes, as found for example, in sensor networks and

tactical networks. Scalability is critical to the successful deployment of these networks [Mauve, M., Widmer, J., Hartenstein, H., 2001]. The steps toward a large network consisting of nodes with limited resources are not straightforward, and present many challenges that are still to be solved in areas such as: addressing, routing, location management, configuration management, interoperability, security, high capacity wireless technologies, etc.

Conclusion and Future Scope

Life long learning will be essential for maintaining a competitive advantage in the global economy, for personal growth, and for simply functioning efficiently in an increasingly technological environment. With an increasing requirement to conduct learning activities independently, the ability to read and comprehend, and to analyze and understand our learning processes, will be key factors in our successful development. These requirements and skills can be improved through the use of Mobile Learning. It provides access to learning during previously unproductive times, it allows more flexible and immediate collaborative options, it allows controlled learning in contextual situations, and provides greater options for teachers to observe and assist in independent learning.

The use of MANETs for education considers that the challenge for the future generation of educational systems is to develop environments for mobile phones and mobile computers as the availability of mobile devices spreads to a billion of users. The mobile telephone is becoming a trusted, personal device with Internet access, smart card usage, and a range of possibilities for keeping the learner in touch with the institution's student support services, in contact with

learning materials and fellow students, while at home, at work or travelling. E-learning can be a learning method for rural people. Basic idea behind the e-learning is interactivity. It can be best method to teach people of rural areas especially from remote areas which are neglected regarding education. Structural education system is also absent there. Though rural areas are out of ICT infrastructure, in recent years, the proliferation of mobile computing devices has driven a revolutionary change in the computing world. The nature of the ubiquitous devices makes wireless networks the easiest solution for their interconnection. This has led to the rapid growth of several wireless systems like wireless ad hoc networks, Wireless sensor networks etc. In this paper, we describe a learning system using ad hoc networks which can be further extended to rural areas that would allow resource-starved village schools in rural India to benefit from the better human and content resources available in the urban environments. The idea is to cover and support people from rural and remote areas through wireless ad hoc networks. Every village as well as rural area will be connected to the mobile access point. This will bridge the gap between people of rural area and education system and we will be able to provide e-learning. In this way we will be able to provide education to maximum people in a country in an interactive way. The e-learning landscape is littered with misguided and expensive "wire-the-schools" projects that have little to show for in the end. To avoid retracing these missteps, we must follow at least two important principles in our solution: cost realism, which is essential if we were to scale up the system to encompass a large number of villages, schools, and students in the long run; and building systems that solve end-to-end education problems, instead of narrowly focusing on just providing connectivity.

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A Review on Effectiveness of Relevance Feedback

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Abstract

This paper focuses on a very powerful and efficient technique using which Content Based Image Retrieval (CBIR) is being performed. If one drills down to the origin of CBIR, one would come across low level features like shape, color and texture as parameters which have been used to represent images. These low level features allow one to locate images which are generally visually similar. Hence non parametric approach like the nearest neighbour search could be applied for retrieval of images from the database. Although, the image retrieval is performed but visually similar images are not mapped to nearby locations. Hence the need arose to create a powerful technique for image retrieval which could cater the high level concept of similarity and subjectivity in human perception. Thus came into existence the concept of relevance feedback. We have performed an exhaustive study on the efficacy of relevance feedback for CBIR from its commencement till present day and have tried to highlight the advancements done so far in this promising technique.

Keywords: Biased Discriminant Analysis (BDA), Content Based Image Retrieval (CBIR), Differential Scatter Discriminant Criterion (DSDC), Direct Linear Discriminant Analysis (DLDA), Direct Kernel Biased Discriminant Analysis (DKBDA), Generalized BDA (GBDA), Grey Relational Analysis (GRA), Hierarchical Non parametric Discriminant Analysis (HNDA), Kernel Biased Discriminant Analysis (KBDA), Kernel Direct BDA (KDBDA), Nonparametric Discriminant Analysis (NDA), Relevance Feedback (RF).

Introduction

RF was initially developed in text-based information retrieval. It was transformed and introduced into content-based image retrieval during early and mid 1990's. It has attracted more attention in the CBIR field than the previous techniques. A variety of solutions have been proposed within a short period and it remains an active research topic.

The RF techniques for CBIR have evolved from early heuristic weighting adjustments to the optimization methods and various machine learning techniques. Recently, along with the promising advances in statistical learning theory and machine intelligence, more and more machine learning techniques are

suggested to attack the relevance feedback problems (Tao and Tang ICPR'04).

RF is an important tool to improve the performance of CBIR. In a RF process:-

1. A number of relevant retrieval results are labelled as positive feedbacks and some irrelevant retrieval results are labelled as negative feedbacks.
2. Then all retrieval results are refined by the system based on these feedbacks.
3. The first two steps are carried out iteratively to improve the performance of image retrieval system by gradually learning the user's perception.

Many RF methods have been developed in recent years:-

1. One approach adjusts the weights of various features to adapt to the user's perception.
2. Another approach estimates the density of the positive feedback examples.

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- Support vector machine (SVM) has also been used as a classification method for RF.

These methods all have their own limitations, respectively:

- The method is only heuristic based.
- The density estimation method loses information contained in negative samples.
- Classification based method treats the positive and negative samples equally.

CBIR using RF

Recently, biased discriminant analysis (BDA) has been used as a feature selection method to improve RF, because BDA models the RF better than many other methods.

BDA forms the basis of research in CBIR. Over the years the short comings of BDA have been identified and new algorithms have been proposed to optimize and increase the efficiency of CBIR. Following are a few modified BDA versions:-

- Nonparametric Discriminant Analysis (Tao and Tang , ICPR'04)
- Direct Linear Discriminant Analysis (Tao and Tang , ICASSP'04)
- Kernel Direct BDA (Tao and Tang , ICASSP'04)
- Hierarchical Non parametric Discriminant Analysis (Chung and Fung , 2005)
- Direct Kernel Biased Discriminant Analysis (Tao, Tang, Li and Rui , 2006)
- Grey Relational Analysis (Cao and Chaofeng Guo, 2007)
- Generalized BDA (Zhang, Wang, and Lin, 2012)

Nonparametric Discriminant Analysis (NDA) (Tao And TANG, 2004; Xu, Yan, TAO, Lin, ZHANG, 2007)

BDA (Tao and Tang (2004), Zhang, Wang, and Lin (2012)) assumes all positive samples form a single Gaussian distribution, which means all positive samples should be similar with same view angle, similar illumination, etc. Clearly, this is not the case

for CBIR. The kernel-based learning is used in BDA (Zhang, Wang, and Lin, 2012) to overcome the problem. However, kernel-based learning has to rely on parameter tuning, which makes the online learning unfeasible. To avoid the parameter tuning problem and the single Gaussian distribution assumption in BDA (Zhang, Wang, and Lin, 2012), a new discriminant analysis using a nonparametric approach has been developed. The nonparametric discriminant analysis (NDA) has the following properties:

- NDA assumes all positive samples are alike and each negative sample is negative in its own way.
- NDA does not require all positive samples form a single Gaussian distribution.
- NDA, may meet the Small-Sample-Size (SSS) problem.

The subspace between the positive and negative samples is found by BDA (Tao and Tang (2004), (Xu; Yan; Tao, Lin, Zhang (2007)). It is spanned by a set of vectors w . The concept is to maximize the ratio between the s_x and s_y , where:

s_x is the positive covariance matrix

s_y is the biased matrix

BDA (Tao and Tang (2004), (Xu; Yan; Tao, Lin, Zhang , 2007) is given by the following equation:

$$w_{BDA} = \underset{w}{\arg \max} \frac{\|w^t s_y w\|}{\|w^t s_x w\|}$$

Let the training set contains N_x positive and N_y negative samples. Then s_x and s_y are defined as:

$$\left\{ \begin{array}{l} s_x = \sum_{i=1}^{N_x} (x_i - m_x)(x_i - m_x)^T \\ s_y = \sum_{i=1}^{N_y} (y_i - m_x)(y_i - m_x)^T \end{array} \right.$$

Where

x_i denote the positive samples

y_i denote the negative samples

$$m_x = \frac{1}{N_x} \sum_{i=1}^{N_x} x_i$$

m_x is the mean vector of the positive samples
 w is computed from the eigen vectors of $S_x^{-1}S_y$

BDA (Tao and Tang (2004), (Xu; Yan; Tao, Lin, Zhang (2007) works in following two steps:

1. It minimizes the variance of the positive samples.
2. It further increases the distance between the positive and negative feedbacks.

NDA is given by the following equation:

$$w_{opt} = \arg \max_w \frac{\|w^T s'_y w\|}{\|w^T s'_x w\|}$$

Let the training set contains N_x positive and N_y negative samples. Then s'_x and s'_y are defined as:

$$\left\{ \begin{array}{l} s'_x = \sum_{i=1}^{N_x} (x_i - m_{xi}^{kx})(x_i - m_{xi}^{kx})^T \\ s'_y = \sum_{i=1}^{N_y} (y_i - m_{yi}^{ky})(y_i - m_{yi}^{ky})^T + \sum_{i=1}^{N_x} (x_i - m_{xi}^{ky})(x_i - m_{xi}^{ky})^T \end{array} \right\}$$

Where

x_i denote the positive samples

y_i denote the negative samples

$$m_{xi}^{kx} = \frac{1}{k} \sum_{i=1}^k x_i$$

m_{xi}^{kx} is the mean vector of the i^{th} positive nearest neighbours of the i^{th} positive feedback sample x_i .

$$m_{yi}^{ky} = \frac{1}{k} \sum_{i=1}^k y_i$$

m_{yi}^{ky} is the mean vector of the i^{th} negative nearest neighbours of the i^{th} positive feedback sample x_i .

$$m_{xi}^{ky} = \frac{1}{k} \sum_{i=1}^k x_i$$

m_{xi}^{ky} is the mean vector of the i^{th} positive nearest neighbours of the i^{th} negative feedback sample y_i .

w_{opt} is computed from the eigen vectors of $S_x^{-1}S'_y$

As discussed earlier BDA (Tao and Tang (2004), (Xu; Yan; Tao, Lin, Zhang (2007) increases the distance between the positive and negative feedbacks, in addition this distance is further increased by NDA method.

Direct Linear Discriminant Analysis (DLDA) (Zhang, Wang, and Lin , 2012)

BDA (Tao and Tang (2004), (Xu; Yan; Tao, Lin, Zhang (2007) suffers from Matrix Singular Problem (MSP). To avoid MSP, DLDA was proposed. DLDA discards the null space of between-class scatter matrix, which does not contain much discriminant information. Then the discriminant vectors are the within-class scatter matrix's eigen vectors with smallest Eigen values.

LDA finds the subspace W . This in turn maximizes the ratio between the between-class scatter matrix s_b and the within class scatter matrix s_w .

LDA is given by the following equation:

$$w_{LDA} = \arg \max_w \frac{\|w^T s_b w\|}{\|w^T s_w w\|}$$

Let the training set contains c individual classes and each class c_i has N_i samples.

Where s_b and s_w are given by following equations:

$$\left\{ \begin{array}{l} s_b = \frac{1}{N} \sum_{i=1}^c N_i (m_i - m)(m_i - m)^T \\ s_w = \frac{1}{N} \sum_{i=1}^c \sum_{j=1}^{N_i} (x_j^i - m_i)(x_j^i - m_i)^T \end{array} \right\}, x_j^i \in c^i$$

$$m = \frac{1}{N} \sum_{j=1}^N x_j$$

Where m is the mean vector of the whole training set

$$m_i = \frac{1}{N_i} \sum_{j=1}^{N_i} x_j^i$$

Where m_i is the mean vector for the individual class c_i and x_j^i is the sample belonging to class c_i .

$$W = s_w^{-1} s_b$$

LDA also suffers from MSP. To avoid MSP a modified version of LDA is used known as DLDA. In DLDA s_b is first diagonalised while the null space of s_b is removed such that:

$$y^T \cdot s_b \cdot y = d_b > 0$$

where y and d_b are eigen vector and eigen value respectively of s_b .

s_w is transformed to k_w

where $k_w = d_b^{-1/2} y^t s_w y d_b^{-1/2}$

k_w is diagonalized by the eigen analysis

$u^t k_w u = d_w$

The LDA transformation matrix is given by:

$w = y d_b^{-1/2} u d_w^{-1/2}$

Kernel Direct BDA (KDBDA) (Tao and Tang (2004), (Xu; Yan; Tao, Lin, Zhang, 2007)

KDBDA algorithm removes the null space of "the negative scatter with respect to positive centred" matrix, and then the eigen vectors of the "the positive with-in class scatter" matrix corresponding to the smallest Eigen values are extracted as the most discriminant directions in the kernel space.

For better understanding of KDBDA one must understand the concept of kernel matrix k such that:

$$k = \begin{bmatrix} k_{xx} & k_{xy} \\ k_{yx} & k_{yy} \end{bmatrix}$$

where

$$k_{xx} = [k(x_i, x_j)] \forall i \in (1, N_x), \quad \forall j \in (1, N_x)$$

$$k_{xy} = k_{yx}^t = [k(x_i, y_j)] \forall i \in (1, N_x), \quad \forall j \in (1, N_y)$$

$$k_{yy} = [k(y_i, y_j)] \forall i \in (1, N_y), \quad \forall j \in (1, N_y)$$

and $k(\cdot)$ is the kernel function.

Since the dimension of o_y is infinite therefore calculating S_y^\ominus is difficult. Thus its eigen analysis is comparatively difficult to perform. The same can be avoided as follows:

$$o_y^t o_y e_i = \lambda_i e_i \Rightarrow o_y o_y^t (o_y e_i) = \lambda_i (o_y e_i)$$

$$\therefore U = o_y E$$

where U is the none-zero subspace (not normalized) of $o_y^t o_y$. The prime subspace of $o_y^t o_y$ is given by:

$$E^t o_y^t o_y E = D_y \neq 0$$

Thus the diagonalized non zero subspace is given by:

$$w = o_y E D_y^{-1} \text{ of } o_y^t o_y$$

i.e.

$$w^t S_y^\ominus w \neq 0$$

Therefore the kernel projection matrix is given by:

$$H = E D_y^{-1} V D_x^{-1/2}$$

At times some diagonal values in the matrix D_x are zero i.e. $D_x^{-1/2}$ does not exist. One can avoid the zero eigen value problem for which KBDA criterion has to be modified. The modified KBDA criterion is given by:

$$w_{KDBDA} = \arg \max_w \frac{\|w^t S_y^\ominus w\|}{\|w^t (S_x^\ominus + S_y^\ominus) w\|}$$

Hierarchical Non parametric Discriminant Analysis (HNDA) (Chung and Fung (2005)

HNDA system is able to select the most appropriate features by analyzing the newly received images, and then apply a Relevance Feedback (RF) approach to improve the retrieval accuracy. As the number of features being analyzed is less, an improvement in performance is achieved.

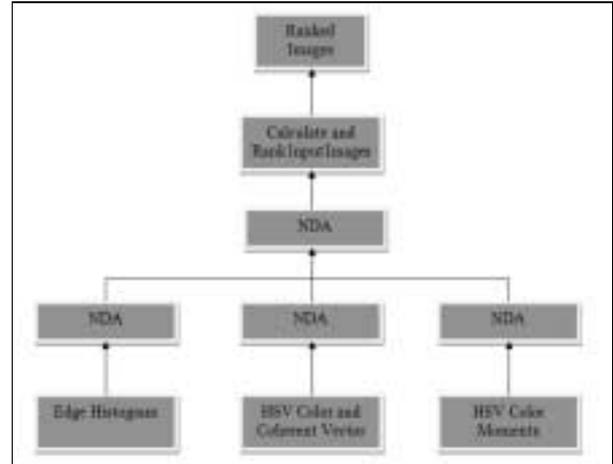


Figure 1: HNDA Framework

This system considers following feature vectors:

1. Edge Histogram
2. HSV Color Coherent Vector
3. HSV Color Moments

HNDA is described in following ways:

1. The feature vectors of the given positive and negative samples are projected into a new feature space by using NDA.

2. The Euclidean distances of each sample are calculated from the positive centroid, in the new space.
3. The calculated distances to another new feature space are projected by using NDA.
4. The points corresponding to the Euclidean nearest neighbours from the positive centroid are returned in the new space.

The smaller the value of the Euclidean distance of the projected point closer it's to the positive centroid

Direct Kernel Biased Discriminant Analysis (DKBDA) (Tao, Tang, Li and Rui , 2006; Xu, Yan, Tao, Lin and Zhang, 2007)

DKBDA aims to significantly improve the performance of CBIR RF and utilize the direct idea to the BDA (Tao and Tang (2004), (Xu; Yan; Tao, Lin, Zhang, 2007) algorithm in the kernel feature space. This direct method proposed is based on all positive examples are same and each negative example is negative in its own way.

DKBDA is an extension of KDBDA. It tries to mitigate matrix singular problem (as discussed in section V). In KBDA based RF, the number of feedback samples is much smaller than the dimension of the low-level visual feature. Unlike KDBDA, DKDBA starts from the analysis of the negative scatter with respect to positive centroid matrix. As previously discussed kernel matrix which is given by:

$$k = \begin{bmatrix} k_{xx} & k_{xy} \\ k_{yx} & k_{yy} \end{bmatrix}$$

The following formulations can be obtained as follows:

$$o_y^t o_y = k_{yy} - \frac{1}{N_x} k_{yx} 1_{N_x, N_y} - \frac{1}{N_x} 1_{N_y, N_x} k_{xy} + \frac{\alpha}{N_x^2} 1_{N_y, N_y}$$

where

$$\alpha = 1_{N_x, 1}^t k_{xx} 1_{N_x, N_y}$$

is an N_x by N_y sized matrix

The modified KBDA criterion is:

$$w_{DKBDA} = \arg \max_w \frac{\|w^t S_y^\Phi w\|}{\|w^t (S_x^\Phi + S_y^\Phi) w\|}$$

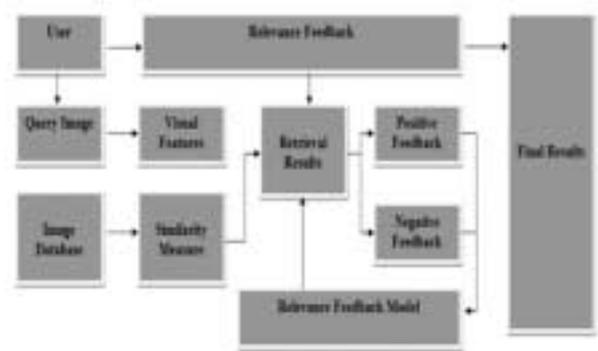


Figure 2: DKBDA Framework

The modified KBDA criterion, the singular value problem can be avoided because

$$\|w^t S_y^\Phi w\| = I$$

Grey Relational Analysis (GRA) (Cao and Chaofeng Guo , 2007)

This algorithm and the query parameters can be dynamically updated via relevance feedback to reflect the user's particular information need. This method performs better than the previous GRA-based algorithms for learning the query parameters in the learning precision and the generalization ability and thus the performance of the relevance feedback for content-based image retrieval can be considerably improved.

It considers the CBIR system as a Grey system. The user inputs a query image, this algorithm computes its similarity with every other image present in the image database and returns the N most relevant images. The GRA method is used to perform the following:

1. Describe the relationship between the feature vector of the query image and the ones of the relevant images.
2. The quantitative grey relational grades are computed.
3. The updates weights are computed based upon the grey relational grades as computed in Step 2.
4. New query vectors are evaluated by combining the feature vectors of relevant images.

The GRA method is described as follows:

Let x_o be reference sequence

$$x_o = (x_o(1), x_o(2), x_o(3), \dots, x_o(n))$$

And x_i the compared sequences

$$x_i = (x_i(1), x_i(2), x_i(3), \dots, x_i(n)), i=1, 2, \dots, m$$

By comparing the difference between sequence x_o and x_i at the k^{th} element, the following is obtained:

$$\Delta_{min} = \min_i \min_k |x_o(k) - x_i(k)|$$

$$\Delta_{max} = \max_i \max_k |x_o(k) - x_i(k)|$$

For $i=1, 2, \dots, m; k=1, 2, \dots, n$

The grey relational grade between sequence x_o and x_i is:

$$\gamma(x_o, x_i) = \frac{\Delta_{min} + \Delta_{max}}{\Delta_{o_i}(k) + \Delta_{max}}$$

where

$$\Delta_{o_i}(k) = \frac{1}{n} \sum_{k=1}^n |x_o(k) - x_i(k)|$$

The higher the grey relational grade $\gamma(x_o, x_i)$ the higher the relative importance to x_i to x_o .

An image representation is a combination of low level image features (like color, texture, shape or layout) and low level visual feature vectors (image representation, like color histogram and color moments). Mathematically an image is represented by

$I=I(D,F)$ where

D is the raw image data

$F=\{f_i | i=1, 2, \dots, p\}$ is a set of low level feature vectors.

In addition to factor D and F, another factor is used to represent image known as M which is the similarity measure. M is given by

$M=\{d_i | i=1, 2, \dots, p\}$

Now an image is given by $I=I(D,F,M)$

The similarity measure can be Euclidean Distance, City Block Distance and L_2 distance. The global distance between the query image $Q=\{f_1, f_2, \dots, f_p\}$ and the database image $I=\{f_1, f_2, \dots, f_p\}$ is given by

$$d(Q, I) = \sum_{i=1}^p w_i d_i(f_i, f'_i)$$

where w_i and d_i are the weights and the distance measures associated with the image representation f_i respectively

GRA Algorithm:

1. Let $l_o = (l_1, l_2, \dots, l_p)$ be the reference sequence and $\{l_1, l_2, \dots, l_p\}$ as compared sequence collection. The preconditioning procedure for data processing is given by:

$$l'_i(j) = \frac{l_i(j) - \min_j l_i(j)}{\max_j l_i(j) - \min_j l_i(j)}$$

$i=1, 2, \dots, p; j=1, 2, \dots, N;$

2. Evaluating the grey relational differences

$$\Delta_{min} = \min_i \min_k |x_o(k) - x_i(k)|$$

$$\Delta_{max} = \max_i \max_k |x_o(k) - x_i(k)|$$

$$\Delta_{o_i}(k) = \frac{1}{n} \sum_{k=1}^n |x_o(k) - x_i(k)|$$

For $i=1, 2, \dots, p$

3. Evaluating the X quantitative grey relational grades

$$\gamma_i = \gamma(x_o, x_i) = \frac{\Delta_{min} + \Delta_{max}}{\Delta_{o_i}(k) + \Delta_{max}}$$

For $i=1, 2, \dots, p$

4. The modified weight w_i associated with the i^{th} feature vector, f_i is evaluated as follows:

$$w_i = \frac{\gamma_i}{\sum_{i=1}^p \gamma_i}$$

For $i=1, 2, \dots, p$

Advantages of GRA algorithm are as follows:

1. It allows the user to submit a coarse initial query and continuously refine his/her information via the relevance feedback.
2. It reduces the user's efforts of composing the query and captures the user's information more precisely.
3. The algorithm dynamically adjusts the weights, putting more emphasis on the representations which matches user's perception subjectivity.

Generalized BDA (GBDA) (Zhang, Wang, and LIN, 2012)

The GBDA algorithm avoids the singular problem by adopting the differential scatter discriminant criterion (DSDC) and handles the Gaussian distribution.

Assumption by redesigning the between-class scatters with a nearest neighbour approach. To alleviate the over fitting problem, GBDA integrates the locality preserving principle; therefore, a smooth and locally consistent transform can also be learned. Extensive experiments show that GBDA can substantially outperform the original BDA, its variations, and related support-vector-machine-based RF Algorithms.

As mentioned previously BDA mainly suffers from matrix singular problem. Moreover it is based upon a strong assumption that all positive samples form a single Gaussian distribution, which is not true in real world. GBDA has been designed to mitigate both the above mentioned issues pertaining to traditional BDA algorithms.

Unlike BDA, GBDA defines interclass separability as a trace difference for the between class scatter and the within-class scatter rather than a trace ratio. Furthermore, to avoid the Gaussian assumption for positive samples, the between-class scatter is specially designed by resorting to a nearest neighbor approach. Additionally, to reduce the over-fitting problem, the locality preserving principle emerging from the manifold learning community, which measures the local smoothness of the feature transformation, is integrated to regularize the interclass separability. Therefore, a locally smooth transform can also be learned.

As mentioned earlier GBDA is based upon DSDC, the same is given by:

$$J_s(\alpha) = \underset{\alpha^T \alpha = I}{arg \max} [J_1(\alpha) - \beta_1 * J_2(\alpha)]$$

where $J_1(\alpha)$ is the between class scatter, describing the interclass dispersion, $J_2(\alpha)$ is the within class scatter, describing the interclass compactness and β_1 is the tuning parameter.

The GBDA algorithm can be mathematically represented by:

$$J(\alpha) = J_s(\alpha) - \beta_2 * J_3(\alpha)$$

$$J(\alpha) = J_1(\alpha) - \beta_1 * J_2(\alpha) - \beta_2 * J_3(\alpha)$$

where

$$J_1(\alpha) = \underset{\alpha}{arg \max} \left(\frac{1}{N_1} \sum_{i=1}^{N_p} \sum_{j \in N(i)} \|y_p^i - y_n^j\|^2 + \frac{1}{N_1} \sum_{i=N^p+1}^N \sum_{j \in N(i)} \|y_p^i - y_n^j\|^2 \right)$$

$$J_2(\alpha) = \underset{\alpha}{arg \min} \left(\frac{1}{N_2} \sum_{i=1}^{N^p} \sum_{j=1}^{N^p} \|y_p^i - y_n^j\|^2 \right)$$

$$J_3(\alpha) = \underset{\alpha}{arg \min} \left(\frac{1}{N_3} \sum_{i=1}^{N^p} \sum_{j=1}^{N^p} \|y_p^i - y_n^j\|^2 \sum_{j \in S(i)} \|y_p^i - y_n^j\|^2 \omega_{ij} \right)$$

Future Scope And Work

CBIR by means of RF is an extremely efficient technique for image retrieval. Although year after year researchers throughout the world have come up with new optimized techniques but there is a vast scope for further optimization of existing techniques. Optimization in terms of speed and efficiency of retrieval of images can be performed. High speed image retrieval is still a major challenge for researchers in academics and industry. CBIR by means of RF has a huge scope in this decade as a thrust area of research.

Conclusion

In this paper we have presented an analysis of different approaches being proposed by various researchers to improve CBIR by means of RF. We came across significant improvement in the algorithms, over the years performing CBIR by means of RF. BDA contributes to be the most prevalent form of RF till date. The major optimizations have taken place on BDA algorithm. It's variants and sub variants have shown substantial improvements over a period of time. Statistically inclined results have been obtained so far. The major problem faced by BDA and its variants is matrix singular problem which has been mitigated successfully by GBDA algorithm. There lies a greater potential of research and optimizations in the BDA and more improved and efficient variants shall be developed over a period of time. Last but not the least relevance feedback is a highly reliable and a efficient method to perform content based image retrieval. In comparison to other CBIR methods, RF has produced significant results which are statistically inclined.

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Bidirectional Associative Memory Classifier for Personalized Recommendations for Farmers

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Abstract

This paper suggests Bidirectional Associative Memory based classifier for agricultural recommendation system. Use of ICT in agriculture sector enables farmers getting the right information at right time. Online web application for farmers can help them in getting information about crops, seeds, fertilizers, price information, their competitors and potential markets. Yet, not all farmers are equally educated to use online information since they have diverse economic and educational background. Hence the web application intended for agriculture sector must be personalized to suit the requirements of individual farmer. This research paper presents an approach for reducing the knowledge gap between farmers and agriculture experts. In this paper a framework for an agricultural website is proposed. The framework consists of different segments. Each segment is designed to fulfill the requirement of a group of users classified on the basis of their personal profile and information needs. Here we propose a novel dynamic classification algorithm based on Bidirectional Associative Memory that stores the profiles of farmers and their associated ratings for information requirement. When a user logs in, his/her profile is matched against the stored results in the model. The user is then redirected to an appropriate segment of the website. Finally, the recommendations are made by the website and made available to the user. A survey is conducted to generate the dataset and results show that proposed model has performed satisfactorily and classifies the users with reasonable level of accuracy.

Keywords: Bidirectional Associative Memory, Content Filtering, Web Personalization.

Introduction

Personalization is a technique by which user can search their related contents. Personalization can be expressed in terms of ontology. Web Personalization is very common now a days, it can be popularly seen in many web applications as well as has been used in content filtering method.

Earlier the problem with website was that when it was created the information on the website was either too good for the people or too less for the people who want to use that. Here we have proposed the architecture of the website in which farmers can interact manually with the personalized helper who are ready to help them 24x7 online. We have rated users to provide them a personalized environment in

which if the farmer is illiterate than also there is someone to help them on a website.

In this study we have created a framework, consisting of classifier which will distinguish between different types of user for example, whether the user is literate or not. A personalization system that integrates usage of data with content filtration, expressed in ontology terms, in order to compute semantically enhanced navigational patterns and effectively generates useful recommendations which create and store user profile of farmers and provide online information to farmers personalized on the basis of their profile. This application is for the farmers who need personalized help for their agriculture related queries. Agriculture is a major contributor to India's GDP in the agriculture sector. Currently this sector contributes 17.2%. Nearly half of the India's population depends on the earnings made from agricultural products. Yet the decline in its percentage has been seen. This fact makes us think about bringing innovation to

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agriculture sector with the use of Information & Communication Technology (ICT). Use of ICT in agriculture sector enables farmers getting the right information at right time. A number of ICT projects for agriculture sector have been initiated by Government of India. Yet there is a communication gap among people who receive the information and the people who actually need this information, that is, the farmers. ICT's Agriculture Business Division has started the project eChoupal to disseminate value added information to its customers. eChoupal project is now launched in several states. This project requires a facilitator to be appointed for a land-size of 25 acres. This facilitator is called the *Sanchalak*. *Sanchalak* provides the technical support to villagers in accessing web portal. ICT is in control of price setting of the commodities and decides daily procurement volumes. ICT monitors the payments made to villagers and appointment of Sanchalaks. However, farmers are bound to use the services of Sanchalak in order to utilize the facilities provided by eChoupal. All the decisions are made by ITC with overall profitability of ICT taken into consideration. This makes monopoly on the part of ITC. In addition, eChoupal projects are targeted for long-run, thereby, this monopoly is also going to sustain in future. The viability of the benefits of ICT eChoupal reaching to weaker section of farmers is also questionable. What is required is the establishment of a public system which can be made available to farmers easily and with low cost. As the computer literacy among farmers is still low and the cost involved in acquiring the equipments for accessing web portals such as personal computers and laptops is not affordable by weaker section of farmers, majority of farmers are still unable to use websites. ICT's eChoupal was successful in eliminating middle man from the system yet farmers require more. The monopoly established by ICT should be short-lived. Farmers need not be dependent on Sanchalak to get day-to-day information such as climate conditions etc. the purpose of ICT should not be to introduce another form of middleman in the form of ICT itself. Such a system will also make farmers aware of the functioning of system. They will feel part of the system and it will remove fear of using technology.

With the passage of time farmers will become more educated and they will be able to use information systems independently without the help of a facilitator. The personalized agricultural recommender system can also be used to promote awareness among farmers by providing information on educational programs and seeking their participation. Government initiative is required in order to establish mobile based web portal which can provide personalized agricultural services to farmers. Vikas Kumar et al. presented a recommender system, *KrishiMantra*, for farmers which provide agricultural recommendations to the farmers on weather conditions using spatial data. The system is implemented in Web 2.0 technologies. The system has query engine, recommender system, knowledge base and analysis and reporting module. The system can be further extended to incorporate real time pricing and mundi information. However, mobile based solution can work for poor farmers. Here a personalized mobile based solution is proposed. The personalized recommendations can be sent to farmers via SMS with which they are more familiar. The personalized recommender can support the needs of farmers in a variety of ways. A knowledge base is required for the recommender system to work with. This knowledge base is required to be created by experts and stores the data about prices and demands, weather information through GIS, information about specific crops, availability of seeds and fertilizers and expert tips. Farmers may send their query through a query interface. Farmers can use SMS for sending queries. The queries can be formulated by specific set of commands.

Some features that may be present in personalized agricultural system include:

1. Sending time to time climate information
2. Information on specific crops, seeds and fertilizers
3. Price of commodities
4. Alert on price change
5. Gathering requirement for procurement
6. Farmer's queries
7. Conducting short surveys
8. Getting farmer's feedback
9. Alerts on educational programs
10. Making awareness about system

Objective

Objective of this study is to create and store user profile and to provide relevant online information to farmers through a single web interface. Since farmers have diverse educational background, the information should be filtered and classified correctly before it is consumed by the user.

For recommending appropriate information to users, a classification mechanism based on Bidirectional Associative Memory is used.

Literature Survey

Personalization technology enables the dynamic insertion, customization or suggestion of content in any format that is relevant to the individual user, based on the user's implicit behavior and preferences, and explicitly given details [A. Jebaraj Ratnakumar, 2010]. This implicitly and explicitly collected user information can greatly influence the effectiveness of a content delivery framework. Personalization can result in increased customer satisfaction and therefore can lead to more visitors of the site as well as customer retention [A. Jebaraj Ratnakumar, 2010]. Personalization has several components such as *memorization, customization, recommendation and support*.

Accuracy and user satisfaction are two important qualities of a recommender system. Accuracy, robustness and scalability can affect user experience. A good recommendation system relies on correct user modeling. There are several strategies for user-modeling. User-modeling requires behavior of users is stored as patterns which can later be retrieved for providing recommendations. Yash Pal Singh et.al [2009] discusses the use of Artificial Neural Networks as a mechanism for pattern recognition. These mechanisms differ in learning strategy. Learning can be supervised or unsupervised. Supervised techniques require training set which consists of input data and response. Unsupervised learning works by clustering input patterns. Artificial Neural Networks can be used for pattern storage and recall. Bidirectional Associative Memory (BAM) can also be implemented as two-layer non-linear feedback neural networks [Bart Kosko 1988]. When BAM is presented with a given input

pattern, it has potential of correctly classifying it to one of the stored output patterns. M. Y. Kiang has given a comparative study of various classification techniques [Melody Y. Kiang, 2003] including Neural Networks, Logistic Models, Decision Trees, Multivariate Discriminant Analysis and Kth-Nearest Neighbor (KNN). Each method has potential of classifying with reasonable accuracy with specific data sets. However, Neural Networks and Logistic Regression work efficiently for most cases. For designing recommender system choice of correct classification method matters a lot. Whenever required different methods can also be combined [Melody Y. Kiang, 2003].

Content Filtering

We have applied the BAM Model (bidirectional associative memory) which consists of content filtering. Content filtering (also known as *information filtering*) is the use of a program to screen and exclude from access or availability, the Web pages or e-mail that is deemed objectionable. Content filtering is used by corporations as part of Internet firewall computers and also by home computer owners, especially by parents to screen the content their children have access to from a computer. Content filtering usually works by specifying character strings that if matched; indicate undesirable content that is to be screened out. Content is typically screened for violence- or hate-oriented content. Critics of content filtering programs point out that it is not difficult to unintentionally exclude desirable content.

Bidirectional Associative Memory Model (BAM)

Bidirectional Associative Model has some basic functions or we can say basic operations that retrieve the nearest pair, addition and deletion of pattern pair, energy for BAM model. But the basic question (what is associative memory?). Associative memory is content addressable structure that maps a set of input pattern with a set of output pattern. When an input is presented it is matched with the store Input pattern. If the match is found the corresponding Output pattern is presented to the user otherwise the most similar match is determined and accordingly the output is presented. In BAM which is of single layer,

by incorporating another layer with the help of auto associations and hetro-associations on the stored memories. The network structure of this is similar to the linear associator but the connections are bidirectional.

Bidirectional Associative Memory (BAM) represents association between two patterns $\langle A_i, B_i \rangle$. BAM are used for two-way associative search. Association between patterns $\langle A_i, B_i \rangle$ is represented as a matrix M. Matrix M denotes the associative memory. Information is passed through M as well as its transpose M^T . Therefore BAM behave likes a content addressable memory, which can store as well as recall information patterns [Bart Kosko (1988)].

Encoding in BAM is carried out by computing the product of transpose of input pattern vector and

output pattern vector:

$$W_k = X_k^T Y_k$$

To simultaneously store a number of patterns a matrix, H is used:

$$H = \sum W_k$$

For decoding the information when a new input Pattern is arrived, the product of input pattern and matrix H is computed to get the output pattern.

Experiments

Survey

We have used the BAM model for our application. In order to gather user input for designing the model, a survey is conducted. A sample of questions used in the survey is given in Table 1.

Table 1. Ratings

Questions	User 1	User 2	User 3	User 4	User 5
Computer literate	5	2	3	4	1
Can access internet	5	4	2	1	3
Need online help	5	3	2	1	1
Personalised help (selling products)	5	4	1	2	2
Need operator assistant	-	2	4	5	5
Compare prices	5	1	3	3	4

[1] For each question user is required to give a rating value in the range 1-5. For instance, if the farmer is computer literate, rating value is 5.

[2] The computation of result given below is based upon the data obtained from 5 users. The rating values are normalized to [-1, 1] and is given below.

$$[3] \mathbf{A}[1] = [1 \ 1 \ 1 \ 1 \ - \ 1 \ 1],$$

$$[4] \mathbf{A}[2] = [-1 \ -1 \ 1 \ 1 \ 1 \ 1],$$

$$[9] \mathbf{R1} = \mathbf{A}[1] \times \mathbf{A}[1]^T = [1 \ 1 \ 1 \ 1 \ -1 \ 1] \times \begin{bmatrix} 1 \\ 1 \\ 1 \\ 1 \\ -1 \\ 1 \end{bmatrix} = \begin{bmatrix} 1 & 1 & 1 & 1 & -1 & 1 \\ 1 & 1 & 1 & 1 & -1 & 1 \\ 1 & 1 & 1 & 1 & -1 & 1 \\ 1 & 1 & 1 & 1 & -1 & 1 \\ -1 & -1 & -1 & -1 & 1 & -1 \\ 1 & 1 & 1 & 1 & -1 & 1 \end{bmatrix}$$

$$[5] \mathbf{A}[3] = [1 \ 1 \ -1 \ -1 \ -1 \ -1],$$

$$[6] \mathbf{A}[4] = [1 \ 1 \ 1 \ -1 \ 1 \ -1],$$

$$[7] \mathbf{A}[5] = [-1 \ 1 \ -1 \ -1 \ 1 \ 1].$$

[8] Our Hetro-Correlator (BAM) stores the resulting pattern which is computed as: $\mathbf{A}[i] \times \mathbf{A}[i]^T$, where $\mathbf{A}[i]^T$ is the transpose of above expression. We compute this as follows:

$$[10] \mathbf{R2} = A[2] \times A[2]^T = [-1 \ -1 \ 1 \ 1 \ 1 \ 1] \times \begin{bmatrix} -1 \\ -1 \\ 1 \\ 1 \\ 1 \\ 1 \end{bmatrix} = \begin{bmatrix} 1 & 1 & -1 & -1 & -1 & -1 \\ 1 & 1 & -1 & -1 & -1 & -1 \\ -1 & -1 & 1 & 1 & 1 & 1 \\ -1 & -1 & 1 & 1 & 1 & 1 \\ -1 & -1 & 1 & 1 & 1 & 1 \\ 1 & 1 & -1 & -1 & -1 & -1 \end{bmatrix}$$

$$[11] \mathbf{R3} = A[3] \times A[3]^T = [1 \ 1 \ -1 \ -1 \ -1 \ -1] \times \begin{bmatrix} 1 \\ 1 \\ -1 \\ -1 \\ -1 \\ -1 \end{bmatrix} = \begin{bmatrix} 1 & 1 & -1 & -1 & -1 & -1 \\ 1 & 1 & -1 & -1 & -1 & -1 \\ -1 & -1 & 1 & 1 & 1 & 1 \\ -1 & -1 & 1 & 1 & 1 & 1 \\ -1 & -1 & 1 & 1 & 1 & 1 \\ -1 & -1 & 1 & 1 & 1 & 1 \end{bmatrix}$$

$$[12] \mathbf{R4} = A[4] A[4]^T = [1 \ 1 \ 1 \ -1 \ 1 \ -1] \times \begin{bmatrix} -1 \\ -1 \\ 1 \\ 1 \\ 1 \\ 1 \end{bmatrix} = \begin{bmatrix} 1 & 1 & 1 & -1 & 1 & -1 \\ 1 & 1 & 1 & -1 & 1 & -1 \\ 1 & 1 & 1 & -1 & 1 & -1 \\ -1 & -1 & -1 & 1 & -1 & 1 \\ 1 & 1 & 1 & -1 & 1 & -1 \\ -1 & -1 & -1 & 1 & -1 & 1 \end{bmatrix}$$

$$[13] \mathbf{R5} = A[5] A[5]^T = [-1 \ 1 \ -1 \ -1 \ 1 \ 1] \times \begin{bmatrix} -1 \\ 1 \\ -1 \\ -1 \\ 1 \\ 1 \end{bmatrix} = \begin{bmatrix} 1 & -1 & -1 & 1 & -1 & -1 \\ -1 & 1 & 1 & -1 & 1 & 1 \\ 1 & -1 & -1 & 1 & -1 & -1 \\ 1 & -1 & -1 & 1 & -1 & -1 \\ -1 & 1 & 1 & -1 & 1 & 1 \\ -1 & 1 & 1 & -1 & 1 & 1 \end{bmatrix}$$

$$\mathbf{H} = \mathbf{R1} + \mathbf{R2} + \mathbf{R3} + \mathbf{R4} + \mathbf{R5} = \begin{bmatrix} 5 & 3 & -1 & -1 & -3 & -3 \\ 3 & 5 & 1 & -1 & -1 & -1 \\ 1 & -3 & 3 & -3 & -1 & -1 \\ -1 & -3 & 1 & 5 & -3 & 3 \\ -3 & -1 & -3 & -3 & 5 & 1 \\ -3 & -1 & 3 & 1 & 1 & 5 \end{bmatrix}$$

Result

We have collected a number of test patterns and applied these patterns on H.

Evaluation of Model

We have conducted the evaluation of our model on the data obtained by conducting a survey on 75 anonymous users. We have given each user a set of questions. Evaluation data is again normalized and applied on our model matrix. It has been observed that the model accurately classified the users on appropriate segment of the website.

For further evaluation of our approach we have conducted another survey on the users who have used our application for obtaining correctness of results. The classifier has divided the users into three segments. The users rated the information on a 5 point scale.

Result of the survey is shown in Table 2. This table consists of data which tells whether this personalization is helpful for users or not.

It indicates segment 1 users who are more computer literate indicated that classification is helpful for them.

Table 2: Result

	Segment 1	Segment 2	Segment 3
Strongly agree	60%	74%	45%
Agree	35%	20%	43%
Neither agree nor disagree	4%	4%	7%
Disagree	1%	2%	3%
Strongly disagree	Nil	Nil	2%

Conclusion

The personalized recommendation system for agriculture sector is highly beneficial for farmers. The framework can be implemented in web applications easily. Websites having this kind of recommendation systems can filter the information to fulfill the needs of individual users.

The classifier based on Bidirectional Associative Memory (BAM) divides the information in different segments. The BAM model is dynamic. It takes into

consideration online update of user profiles and accordingly computes the recommendation information. The result shows that performance of our model is satisfactory.

BAM model has advantage of correctly classifying the input data containing noise also. But this model has comparatively low memory capacity. Hence further research is required to explore classification mechanisms which eliminate this limitation.

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Challenges and Risks of Social Networking in Mobile Commerce

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Abstract

Mobile commerce is not limited to making transaction through mobiles. It has expanded its area to social networking and marketing. Google wallet and mobify are the types of support to mobile commerce. Social networking is the vast field where mobile commerce is growing its seeds. Research has shown that mobile commerce has used social networking as a traffic driver. People using e-commerce are also using mobile devices for making transaction. E-commerce can optimize the mobile usage by deploying responsive site designs paired with server based logic to minimize assets served to mobile user. So there is an immediate need to take care of mobile shoppers. Mobile devices due to its uniqueness, mobility and ease of availability are helping in growth of mobile commerce. It is a fact that social networking is also not limited to entertainment, but growing because of public interest in developing their business and business social network. Many challenges related to security, cloning of SIM, technical and non technical risks of mobile commerce are creating obstacles in optimal usage of social site in mobile commerce. This paper describes the key issues related to usage of social networking in mobile commerce and provides a solution to technical risks related to the same.

Keywords: E-Commerce, Mobile Commerce, SIM Cloning

Introduction

Mobile commerce or M-Commerce has expanded its region and is not limited to only making transactions. The scope of M-Commerce is now in sales, marketing, SCM and CRM. Mobile marketing will make the 30% of web traffic shown by executive at the end of 2013. M-Commerce is fulfilling the need of anytime anywhere shopping of customers. It accelerated the growth of smart phone market. The low cost of mobile phones increases the rate of penetration of M-Commerce which is different in different countries. It is expected that in 2013 people will buy more than 12 billion of mobile devices.

The mobile platform has expanded at rocket speed and expected that more than 70 billion of mobile application will be downloaded by 2014. Mobile applications are used for political, business, education and social network. The mobile applications act as central collection point for user's personal and social information.

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Mobile users are more social than the desktop user. One third of Facebook postings are through mobile phones. E-commerce sites and developers are also developing new application for mobile devices. Lowe's has optimized a new Facebook application for mobile devices.

The intersection of social media and M-Commerce is significant and has continuous growth. It helps the user to use M-Commerce within social space and not to be tethered to their desktops. Social media allows the M-Commerce users to create their own project. Social network need to keep focus on M-Commerce to generate revenues in the fast growing mobile world. Facebook facilitates the user to purchase credit with charges being reflected in mobile bill. Twitter has the "fast follow" tool to get SMS update from different brands. Foursquare allows the user to get deal and a chance to build reputation. It allows the brands to create pages and leave tips for the consumers of various locations. Groupon is more like a location layer on the user's deal model. It allows the user to see the deals in proximity to purchase right away. Google wallet is path breaking initiative that allows the user to transfer the money just by tap. The latest version plans to hold tickets, boarding passes and car keys.

The use of mobile commerce and social media in business is still in its early stage. Today only 9% of users follow different brands on social media and only 6% make a purchase. Research has shown that only 14% men and 8% women use their mobile phone applications that support shopping. 63% users shop or purchase by visiting brands or retailer's website whereas 6% make it through social media.

Gender, age group and educational level also divide social and mobile platform to put to good use by retailer to better target and engage their customers. ComScore (2012) showed that social networking is growing very fast within the age group of 18-29. There is a fundamental barrier in customers mind why they should communicate directly with brand or why brand need to communicate with them directly. Different customers today embrace the social media and both search for product information and make buying decision.

Impact of Social Networking on Mobile Commerce

Fred Cavazza (2012) in his paper has described six pillars to use social networking sites for mobile commerce; these are: Visibility, Proximity, Contextualization, Reputation, Recommendation, Customer care. Many retailers have launched their mobile optimized sites not only for their customers but for a payment gateway point of view also. Proviti (2011) proved that AsiaPay has also decided to utilize M-Commerce to serve better their customer. Its survey also showed that M-Commerce's security, policy and integration are among the top priorities.

Any company can retrieve the information about customer's location and their liking from their profile on social networking sites. If the customer is in the nearby location, they can offer him lucrative services by sending SMS. This way mobile devices offer companies the opportunity to conduct marketing campaigns that aim to drive the company's mobile, in-store traffic and sales. Retailers can send text alerts and digital coupons, product rating and reviews, locating stores, scanning barcodes. It has become a smart and emerging tool of marketing.

Nielsen (2007) stated that 75% of respondents from 47 markets across the world considered rated

recommendations from customers are most trusted and famous form of advertising. The user's interest to maintain their relationship on social networking sites by fulfilling the commitments such as adding new friends, updating the wall, uploading the liking comments with picture promote the business. Books and clothes are the most common items to be purchased through M-Commerce by this type of promotion.

Social networking help to build a good brand image because many people join online community and converse regularly. Domino's Pizza has built a great brand image using online community. Social networking sites shorten the distance between potential customers and the product. These sites ask the feedback to customers which allow the businesses to improve their product.

M-Commerce affects positively to retailer's business. But industry leading retailers are reluctant to share other side of story which shows slowing the growth, adoption and economic benefits can be experienced if customers accept the wireless in-store transaction as norms. Pelet (2011) poised that organizations need to develop highly technical expertise and business strategies for effective M-Commerce website.

Security Risk Involved in Using Mobile Commerce through Social Networking

Gururajan (2006) has categorised security risks into technical and non technical risk. The technical risks have more concern of sender and service. The security risk such as theft and loss of data is the primary concern to use M-Commerce. Security in the case of M-Commerce is more significant than a traditional E-Commerce as it is ease to eavesdrop into other's message with minimum difficulty in mobile environment. The small screen size of mobile and security issues of device are hurdles to adopt M-commerce. 6% of consumers believe that mobile website don't offer the same range of product as desktop sites. 41% of consumers feel it difficult to shop through mobile because of small screen. 39% of consumers are very much concerned about the security of mobile phone. 67% consumers have 3G mobile and 13% believes that 3G access is too slow for shopping.

The protection and privacy on device are the major issues for using M-Commerce effectively. Mobile security will be the major issue in 2013 as long as applications continue to access personal or device specific information without gaining proper informed consent. The largest remote attack surface of mobile device is mobile browser. These attacks may tether mobile application and make it a target for broad based attack.

INIT (2010) in its report said that trust to use M-Commerce through social networking is based on six factors that are: Site quality, Security of transaction, Communication, Social presence, Customer support and Online community. The higher risk of location based application is that it can be available through them to anyone.

Many brands do not have proper interface or API of their website to fit with mobile screen. Therefore, it is not easy to find customers based on product preference, with similar interest on the mobile web, directly linked to their browsing and purchasing history. Some problems like bandwidth limitations, payment protocol, quality of service and shipping delays also effect the growth of M-Commerce.

M-Commerce uses mobile device for payment in two different modes a. mobile as payment device to initiate payment by consumer b. mobile as acceptance device to accept payments by a merchant. Mobile is accepted as payment device everywhere from hawker to café. Customers can compare the prices and get benefit of promotional opportunities like digital coupons. Customer can store their payment card information in an easily accessible online location. Mobile payment in e-commerce environment and physical point of sale is defined as remote payment and proximity payment respectively. The proximity payments are intuitive and similar to today's payment method like contactless technology or NFC. NFC is backward compatible with existing payment and transit card. A short range radio signal is transmitted between phone and terminal to initiate the payment and process through card processing network and systems. New software allows the small merchant to subscribe the payment services and accepts the payment via key entered card data through magnetic stripe or chip reader to a mobile

phone. Card data is entered electronically as with a traditional POS device. Proximity payments use EMV standard to ensure mobile proximity payment and smartcard enabled payment delivers same end to end security. Standardization and integration are two main challenges for proximity contactless payment. Mobile devices are developed very fast with innovative techniques to access payment information stored on chip. Some times lack of technology and lack of coordination between card issuer and device manufacturer lead to more attacks. Remote payments are more susceptible to threats due to openness of mobile platform.

The world of e-commerce is using standard web software like Windows, Linux operating systems, whereas mobile platforms are facing frequent changes to operating systems and a wide variety of underlying hardware architecture. The risk of attack in e-commerce is low as it will work on internet when it is on but mobile phones are on even when we sleep. The other prone area of attack is Smishing i.e. SMS text phishing and Vising i.e. voice phishing, as the data can be sent through voice and text on mobile phones. Include mobile security software as default suite of application. Mobile phones should be certified for proximity payments. Payment related security standards should be reviewed and revised timely. The user should continuously check and update the certificate of third party application and device. Vendors those provide mobile payment space should encrypt sensitive data without relying on mobile protocols like GSM and CDMA. End to end encryption should be the part of product functionality. The device should have secure installation of EMV-complaint POS system.

Challenges in Mobile Commerce

The challenge in mobile commerce has started with mode of payments. The scope of m-commerce has not been limited to this; it has been used in a greater context of mobile marketing, sales and CRM. Earlier facebook has given check in facilities with different outlets which is now closed because different users have different mobile may not have facebook app on their device. Facebook facilitates credit purchase with mobile payment and the customer can purchase with

charges being reflected in their mobile bills. Many businesses through social networking provide infinite opportunities for customer to connect with them. Both social networking and M-commerce offer unbounded possibilities for recognition and promotion of both brands and trademarks. Mobile devices are the valuable tools for customer for business and for shopping to-distribute content via applications, interactions and enable purchasing decision by providing bar code scanner, product locator and mobile payment solution, but the major risks are availability of these tools on mobile device. Neither all the devices have these applications, nor all the service provider allow to use these techniques.

Privacy of user, lack of trust and health hazard records has directly influenced the customer in m-commerce. Moreover low processing power, modular exponentiation, low memory and weak battery power are also major challenges in growth of m-commerce.

Customer interaction is the major asset of a company which is not possible in m-commerce. Though it is free from shelf size limitation, yet it does not get the feed back from customer on their demand which becomes a major reason in its reduction in growth. Not all the business can be done through mobile. Its limitation of small screen causes a hurdle to develop mobile market in real estate. It is also not convenient for all business to business chain such as automobile manufacturer.

Mobile devices generally get disconnected when they move from one cell to another. This disconnection may lose the transaction and all functions are required to setup again. Lower bandwidth and usage of different technologies in different devices are the prime reason to make slow growth of m-commerce. It also makes m-commerce costlier than e-commerce. There are some applications of m-commerce which suffers a lot due to lack of customer interest and security of information. The U.S. bank, Wells Fargo is planning to close down their mobile service because of aforesaid reasons.

Perspective Solution to Successful Usage of Social Networking

The mobile devices have become the important part of our life. Its success in business depends upon the

type of business, device used by consumer, national framework of a country and technology of device. The security of data and privacy of information can be solved out by making change in technological framework of different protocols used. There are following perspective solution to make social networking successful in m-commerce.

1. Application should be simple. It should be a simple process for intuitive search and browsing which can easily overcome the problem of small screen.
2. Enhanced security for different payment modes of m-commerce. In India, we are using SMS based techniques which can be made SAFER by using encryption and parsing of data.
3. Development of native applications increases responsiveness and speed of application.
4. Marketing strategy for m-commerce should be different than e-commerce. It should be more focused on location based, mobile email-marketing and coupons.
5. Keep an analytical card for the key performance indicators for effective management of m-business.
6. Mobile application should be platform friendly which takes more time for developing but saves customer's time. Like Amazon has application to save the payment detail and customer's address after first time purchasing, so that next time user need to enter only user name and password.
7. Mobile Website should provide on site search to give options for predictive search across all platforms.
8. The payment partner should be trusted and should have user friendly payment mode.
9. The payment partner should provide access to vendor's relevant and hot offer. It should also compel to existing and new offer.
10. Mobile website should be content centric and context driven than event driven or program driven.

The aforesaid points do not discuss the technological and operating system framework dependency in m-commerce. It is a huge area of discussion and development to make highly effective involvement of social media in m-commerce.

Conclusion

The challenges of social networking are growing at faster pace than any business can manage. Security vendor Web root Software Inc. in its recent report has shown that the users are increasingly aware of the risk of sharing too much information on social networking sites. 27% of users have blocked their profile to be found at search engine.

Mobile phones have emerged as one of the most ubiquitous technologies among wireless technologies. The mobile phones shape the interaction of users with their communities, countries and economics. The business have more control over Wifi than GPS, as one barrier they face is getting customers more comfortable with using it on their phones. There is

lack of applications on desktops such as those that Android, iphone and blackberry have created for mobile phones. Time pressure and ease of availability of mobile phones allow the user to work on phone than desktop. The users can be influenced by aesthetics consideration, as they spend more time on their mobile phones. Now a days many mobile phones are having advance and more developed operating system which support the mobile commerce, but still customer support to work on small screen and security of transaction is creating major hurdles in emergence of m-commerce.

The sure way to mitigate risk is for business and service provider to spend money and efforts on implementing the right authentication strategies. They should also pay high level attention to monitor new threats and potential risk in working environment. Though social networking acts as business development tool for marketing, promotion and sales of product, yet the availability of information to anyone and fraud online communities slows down its process.

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“Experiential Learning”-An Innovative Learning Horizon

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Abstract

The term “Experiential Learning Theory” (ELT) refers to the procedure of learning from knowledge gained through study, past experiences or simply by practice. Action is the core of experiential learning. The models, theories and methods of experiential learning form the basic framework for learning-by-doing approach to education and training. In order to validate a theory or concept, it associates real experience with the phenomenon. The focal point of Experiential Education concept is the art of problem solving and critical thinking rather than mere memorization and parrot-fashion learning. The phrase “experiential” differentiates ELT from cognitive learning theories and behavioral learning processes as the ELT focuses on the learning process rather than the learning product. The literature review section of this paper outlines the exceptional work done by educational theorists such as John Dewey, Kurt Lewin, and David A. Kolb. Altogether, Dewey’s pragmatism theory, Lewin’s social product of psychology supposition and Piaget’s cognitive-developmental hypothesis shapes an exception all earning and development perspective. David A. Kolb devised a cyclical model of learning consisting of the following four stages namely, real experience, automatic observation, abstract conceptualization and active experimentation. The paper in section II describes in details the principle features and the holistic process of experiential learning. Experiential learning process consists of a number of steps providing the learner a complete hands-on experience, collaborative and reflective learning together with understanding to acquire new skills and knowledge. The learning content though is important but the heart and soul of experiential learning remains the learning process. The pedagogies such as internships, Computer-Aided-Learning (CAL), Live case study etc. are also discussed highlighting their striking features to provide real time or direct experience to the student. The paper also reviews the role of the instructor and the learner and their direct and indirect involvement at every stage of experiential learning process. At each step of the experience the learner is enthusiastically and personally involved in posing queries, performing investigations and experiments to solve problems while being creative and constructive. The instructor here plays the role of the facilitator who guides the learner rather than directing the learning process. In section III the paper provides a comparison between the experiential learning and academic learning methods along with a discussion on their relative dimensions. An analysis of the current implementation of experiential learning as powerful teaching and learning tool is done by providing a review of experiential learning methodology being followed in schools and university education. The learning style or approach being followed in classroom greatly affects the education standard and also has a striking impact on student’s thinking and learning process. Not only educational organizations but the professionals in leading business organizations are following and applying experiential learning tools and techniques to impart training to its employees at all levels. This provides applicative professional management training along with an all sphere organizational development. The concluding section of the paper realizes the critical aspects of experiential learning in with respect to its usage, applicability and benefits that it provides to the learner thereby opening a new horizon to learning.

Keywords: Experiential learning, innovative learning, computer aided learning, education, academic learning.

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Introduction

The term ‘Learning’ refers to the practice of acquiring knowledge and skills and the term ‘Experience’ denotes a collection of activities and events from which an individual or group may obtain knowledge, formulate opinions and acquire skills. On integrating the two terms defined above, what is obtained is called

‘Experiential Learning’. Thus, ‘Experiential learning’ can be expressed as the process of learning through experience, through action or simply learning through innovation and exploration. The theory of experiential learning discusses a dynamic and holistic model of learning and development process, with consideration on how people acquire knowledge and skills to grow and develop. “Experiential Learning” highlights the significance of experience in learning process. This important factor of ‘experience’ differentiates Experiential Learning Theory (ELT) from many other learning philosophies such as cognitive learning theory

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that lays emphasis on cognition over affect, and models of behavioral learning that contradict role of subjective experience in learning process [1]. According to Wurdinger and Carlson, college teachers mostly teach by delivering lectures since few teachers learnt to teach using other techniques of teaching [2]. Imparting knowledge through lectures is an important teaching method but an instructor must also encourage active participation of students in gaining knowledge through discussions, practical activities, and group work and skills application beyond classroom. This process defines experiential learning where students are involved in learning content in which they have a personal interest, need, or want. Experiential learning can be explained in two perspectives, firstly as a mode of learning in which learners obtain knowledge and apply it instantly in some appropriate context [3]. Here learner is directly involved with the subject under study rather than mere parrot-fashion learning. Such type of learning is supported by an organization to impart training under different professions and various fields of study. The other type of experiential learning is based on person's everyday experiences and such learning process is not backed by any institution but the learner himself [3]. Experiential mode of learning presents a semi-structured approach in which students learn through cooperation with one another rather than competing with each other and remaining uninvolved as in more structured traditional classroom teaching [6]. Under experiential learning process students are engaged in direct experiences gained by facing real world problems and situations. Although student is the primary role player but to ensure success of learning process, instructor must facilitate rather than direct student involvement. The characteristic features of experiential learning are discussed below [4, 7]:

- **Combination of process and content:** The fundamental theory of content and experiential activities must be in equilibrium with each other.
- **Instructor's Role:** Instructor may work as a facilitator who not just directs but serves as a coach and helps learners to self-discover, share and apply knowledge.
- **The big picture vision:** Experiential activities must be designed in a way to encourage students

to link their learning with the world activities. At the end, students must be able to see through complex problems and systems and work within them.

- **Reflection and Insight:** Learners being the main role-players should reflect on their learning and observations to gain insight to relate theory to real life situations.
- **Total Involvement in the process:** Learners must be fully occupied in the experience to the point where the knowledge learnt, skills acquired and experience gained impacts the learners' overall thinking mechanism.
- **Basis for Future:** The outcomes of the present learning and skill acquired are personal to the student and may form the basis for and direct future learning and experience.
- **Predictability:** In the experiential learning process the results or consequences of the experience cannot be predicted totally. Thus, the instructor and learner may experience success or failure or risk-taking and uncertainty that cannot be predicted.

Student is the most important and the most benefited entity in the overall experiential learning process. Various learner groups have been recognized and the benefits that experiential learning methodology can have may differ from learner to learner. Some learner groups who benefit from experiential learning are discussed below [12]:

- An established learner who is no more in link of traditional classroom studies but wants to get back to academics.
- A learner who wants some motivation to learn by self-experiencing the significance of the subject.
- The learner who needs a different learning technique since he faces problems in learning through traditional methods.
- The learner who desires to strengthen his traditional knowledge through hands-on or practical experience.

Action is the central part of experiential learning process [6]. The models, concepts and approaches of

Experiential Learning Theory (ELT) form the basis for learning-by-doing methodology to education and training. In order to confirm a concept or theory, it associates actual experience of learner with the phenomenon. Thus the art of problem solving and critical thinking serves as the pivot point for 'Experiential Learning' concept rather than learn by rote to memorize. In the subsequent sections various aspects of experiential learning are discussed.

Literature Review

Learning through experience is not an altogether a new concept in context of high level teaching. Numerous terms and expressions have been used for defining the learning from experience process by prominent educational psychologists such as John Dewey, Carl Rogers, Kurt Lewin and David Kolb. The foundation laid for learning philosophies aiming at learning by doing or experience learning concept. As promoted by John Dewey, the notion of Experiential Education accentuates critical thinking and problem

solving tactics rather than rote learning or learning by memorization. According to Carl Rogers, experiential learning is far more "significant" in comparison to cognitive learning approach. David Kolb proposed a four-stage experiential cycle that focuses on various roles of learner i.e. to experience, reflect or share, reason and action. Kolb observed that actual learning experience is very crucial factor for meaningful learning and knowledge gaining process. It may be conferred that in any pedagogical approach followed the learner and instructor both play significant role in the overall learning process. Some significant works in experiential learning approach are discussed below.

Lewinian Experiential Learning Model

The Lewinian model of 'Experiential Learning' was proposed by Kurt Lewin. His model focused on Action Research and Laboratory based training. He supported the "Cooperative learning" concept and suggested that there are diverse categories of people in society stressed on interpersonal relationships among them[4, 10].



Fig. 1: Kurt Lewin Experiential Learning Cyclic Model

Action research is seeking continuous change by personally involving people and doing things individually for the development & plan change. Two aspects of this learning model are important. Firstly, the concept of concrete experience to test and validate abstract theory. Here personal experience plays the center of focus for learning and provides a concrete and shared locus point for testing validity of ideas and its implications during learning process [5]. Secondly, action research and practical training both are based on response or feedback route. Lewin used electrical engineering concept to explain how learning and problem solving process creates valid information to detect deviation from anticipated goals. In this way feedback directs goal oriented action and results assessment. The aim of Lewin model is to combine the laboratory based practical approach and action oriented research into an effective and goal-oriented process [5]. The concept of Action Research differs traditional research but they jointly covers the concepts of data collection, systematic inquiry & problem solving where as traditional research individually focus on seeking explanation & truth, striving for knowledge being taken from the researches [9]. The four-stage Lewinian Experiential learning model [5] is described in Fig. 1.

‘Learning by doing’ Theory

John Dewey’s learning model shares many similarities with Lewinian model discussed previously. John Dewey proposed the theory of ‘Learning by doing’ or simply ‘Experiential Learning’. Dewey clearly explained the Lewin’s notion of learning as a feedback or response process by unfolding how concrete experience is altered by the learning process into high-order determined action [5]. His theory is based on some suppositions such as: personal involvement in the activity to discover the best, if behavior of individual is changed with knowledge then it has the some significance and if a person set their goal & to achieve that he worked hard learn more to achieve that [6]. According to Dewey’s educational philosophy, the two terms education and democracy were mutually dependent since democracy sets free intellect and mind for self-regulated efficiency [8]. He supported active involvement of students in educational activities

because lack of initiative on learner’s part results in behaviors of dependence on the cues supplied by others. Dewey believes that quality experience is the fundamental basis of education and the most important parameter to be set is the interaction and continuity of experience. Continuity propels the learner to learn more since one experience forms basis for other experiences and so on. Interaction occurs when inner needs or goals of a person are met by his experience. Two categories of education based experiences were identified by Dewey namely, mis-educative and non-educative [11]. A mis-educative experience stops or distorts growth for future experiences. In a non-educative experience a person has not done any reflection and so has obtained nothing for lasting mental growth. Recent research trends describe that experiential learning does not behave as a substitute traditional methods of learning but constantly help to improve student’s understanding by allowing him to explore while learning and thus, develops in the process [14].

John’s theory gave support to many of the fundamental tenets of youth work, such as the importance of relationships, the role of conversation and why it is essential to ‘start where they are at’.

David Kolb’s Experiential Learning Theory

According to David A. Kolb learning is the process whereby knowledge is created through the transformation of experience [13]. In the theory of human learning and development experience plays a vital role. Kolb theory is based on reflection of experiences. Learning system is taken as perspective of organization and process of learning is taken as a management process [9]. The learning framework presented by Kolb relies on two continuums forming a quadrant as [15]:

- 1. Processing Continuum:** It represents one’s approach to do task. For Example, preference to learn by simply watching or by hands-on experience.
- 2. Perception Continuum:** It represents emotional or sensitivity based approach. For example preference to learn by either feeling or by thought process.

According to the Kolb learning can be completely performed by completing the full cycle of the process instead of adopting only single learning style. Kolb's learning cycle model involves four processes necessary for learning process to take place and are describes as below [5].

He gave four stages as learning Model:

- Concrete Experience (or “DO”): when a learner is learning from the Live session or classes.
- Reflective Observation (or “OBSERVER”): when the learner revert back from its experiences.
- Abstract Conceptualization (or “THINK”): When we are evaluating the model that what we are observing.
- Active Experimentation (or “PLAN”): when learner is planning for future experiences on the basis of last experiences.

Concrete Experience & abstract conceptualization are the two opposing way of acquisitive information whereas Reflective observation versus active experimentation are the ways of converting & giving out information. Learning style can preferred with the

combination of acquisitive & changing of information. Kolb's notion of learning process could be viewed in context of people translating between the four above defined processes: Concrete Experience and Abstract Descriptive, Reflective examination and lively Experimentation. Hence, the success of learning process greatly depends on balancing these processes. According to his theory Kolb proposed that the four combinations resulting from perceiving and processing continuums determine the four learning styles that describe different patterns of behavior and can also be referred to as learning preferences [15, 1].

- I. Diverging (Concrete Experience, Reflective Observation) – In this style the emphasis is on new and innovative view of doing tasks. Here situations are viewed from different perspectives and acclimatize through observation and not by action.
- II. Assimilating (Abstract Conceptualization, Reflective Observation) – Combines diverse observations, thoughts and interpretations into an integrated whole. This theory consists of reasoning inductively and form models and theories. Likes to create projects and experiments.

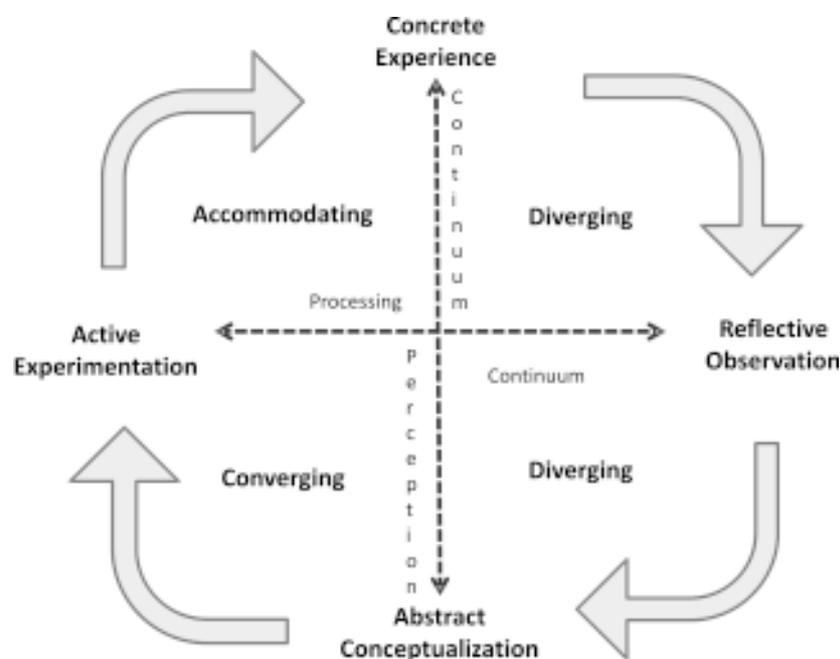


Fig. 3: Kolb's Experiential Learning Cycle and Learning Styles

- III. Converging (abstract, active) – focus on real application and thoughts and get the solution for the difficulties.
- IV. Accommodating (concrete, active) – rather than idea and expression solve the problem with practice and an individual should be flexible who can survive in any of the environment and discover new ideas from there this practice help them to learn more[2].

Based on the learning philosophies discussed above it may be conferred that learning process must appeal to students’ ideas, beliefs and view points on a subject in order to examine, experiment and integrate with more innovative and polished ideas. Learning necessitates the resolution of conflicts among dialectically conflicting approaches of adaptation to the world. It allows learners to translate across divergent modes of action, reflection, feel and thought process.

‘Experiential Learning’ Process and Pedagogies

The overall process of experiential learning comprises of several steps enabling applicative, collaborative and reflective learning experience to the learners for acquiring knowledge and skills [6]. The focus is on process based learning and not simple content based learning. During each phase of experiential learning paradigm, learners are completely involved along with the content and the instructor. The different phases of experiential learning help learners to Explore, Reflect and Apply as discussed below [20, 28]:

Explore or Doing-When learners are actively involved in practical-based learning activity, they not just learn but explore. Creating models, dramatics and role-playing, delivering a presentation, problem-solving, playing a game etc. are some examples of activities that may enable the student to explore while learn. A basic aspect of experiential learning paradigm is what the learner learns and what skills he acquired from his experience.

Reflect or Sharing-Students eventually start reflecting on learning activity when they are able to think and share views about it. They share their experience, recorded observations and results with their peers. Thus, learners reflect on what they explored in the process so that the experience they gained can be used in future.

Apply-Finally, learners need to apply the experience that they learnt in the process to everyday life. In this phase they will confer how their observations and issues pointed out could be used in future.

The learning content though is important but the heart and soul of experiential learning remains the learning process. Various pedagogies have been proposed in view of experiential learning paradigm. The traditional approaches with very slight or no experiential learning prospective were simple lecture deliverance, seminar discussion, and research paper while the methodologies such as problem solving, case discussions, group discussions, laboratory exercises, and write-ups had improved potential of experiential learning. Three of the most popular pedagogies such

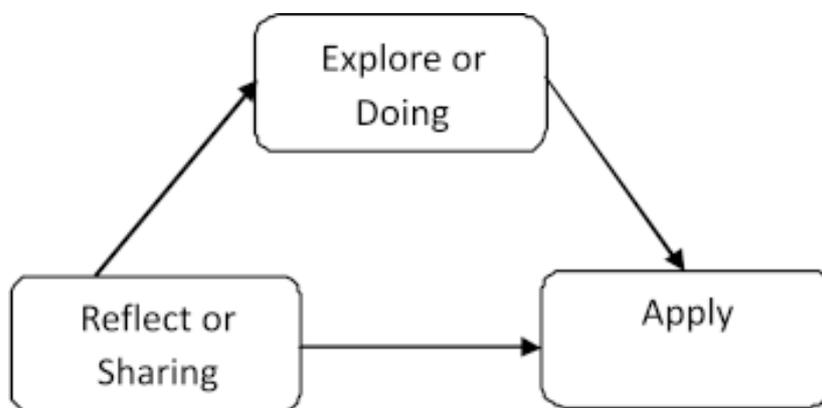


Fig. 4: Different steps in Experiential Learning model

as Internships, Computer-Aided Instruction and Live-Cases have accelerated potential for experiential learning and are described below [29]:

Internships- Internship is one of the most popular pedagogies among students as it is mostly participative, real-time based, interactive and possess the element of variability or uncertainty.

Before going for internship students must have a minimum basic theoretical knowledge that they can apply to get real time work experience from an organization. It is nearly impossible to structure the experience for the student because internship is external to the university environment. Consequently, the internship experience varies depending on interns and the organizations providing internships. Thus, to control the nature of the experience it requires great deal of efforts on part of university, college and the instructor in charge.

Computer-Aided Instruction-Another approach for experiential learning is computer-aided instruction. This approach provides excellent visualization advantage, is highly structured, controlled with focus on content but may lack on many criteria such as interaction, learner's perspective, contact with the surroundings, and is quite predictable. In general, such an approach should be classified as being very low in experiential learning potential.

Live Case- This approach takes care of the criteria and may include minor business case study, a marketing survey research project for a local business organization or developing an advertisement campaign for a business firm. Mostly, learners do Live Case studies as part of their course requirements. The learner first establishes the information needs by attaining background details. Then questionnaire are prepared and pretested followed by developing a sampling plan, data collection, code them, data entry in computer, data analysis, report writing and finally presenting it to the customer. The criteria of participation and interaction are very important along with contact with the environment. Variability criterion is very prominent in the early stages while learners try to understand and investigate the problem. However the role of instructor is very crucial in teaching content and project completion within deadlines.

As discussed above whatever pedagogy may be followed but the role of instructor is very crucial. In experiential learning, the instructor must act as a facilitator and guide student rather than directs the learning process where students are naturally interested in learning. The mentor assumes the role of facilitator and is guided by a number of steps crucial to experiential learning as noted by [24]

1. Be willing to accept a less teacher-centric role in the classroom and do the learning in a positive and non dominating way.
2. Identify an experience and situation in which students will find interest and be personally committed.
3. Combine your experience with the student experience through sharing the views.
4. Combine the course objectives with different course exercises so that student learns more with the more interest.
5. Provide all the resources to the student all that they require for the growth and enhance them to search more to learn more.
6. Follow the teaching decorum and illuminate students and mentor roles.

'Experiential Learning Tools and Techniques'

Experiential learning can be easily related to and compared with academic learning. Academic learning refers to the course of action in which the information and knowledge about a subject is acquired through simple learning without any requisite of direct experience. The scope of academic learning consists of two dimensions namely, constructive learning and reproductive learning while experiential learning dimensions are investigation, initiative, and involvement [19]. In so called 'constructive learning' linking, structuring and critical processing play a vital role while in 'reproductive learning' learn by rote and step by step processing are the central processes [16]. Learning is an assessment or performance driven process to a large extent. Learners have the tendency of formulating strategy of studying according to the expected performance. Usually performance is

reproductive, so learners strategically try to identify what is important in view of their instructor and simply memorize that [17]. Reproductive learning and Constructive learning are generally regarded as two divergent poles that are not negatively correlated, but are independent and at times positively correlated [16]. Students generally use Test pools and take notes for reproductive learning but fail to apply these strategies in problem oriented constructive learning environments. In constructive learning framework learners need to clearly understand the nature of the problem or project at hand and problem requirements with the help of working examples, sample problems and model questions [17]. After the learners recognize what the solution will be like then only the process of problem depiction and decomposition can be initiated [18]. Constructive learning highlights learners' perception on meaning definition and relates ideas to experience, skills and learning. Thus, constructive learning employs conceptual plus strategic thinking as compared to reproductive learning [17]. Both, academic learning and experiential learning are concerned with inculcating knowledge and skills in the student. Academic learning, as discussed earlier, consists of abstract and classroom-based methods while experiential learning dynamically involves the student in a more concrete experience. Experiential learning conventionally relates to three distinct applications in perspective of higher education namely: Field-Based Skills, Prior Learning Credit, and experiential applications for Individual Development and Classroom-Based Education [21, 22] as discussed below:

1. Field-Based Skills- To acquire field based skills and experience learners are encouraged to work with specialists of their field of study. This involves learning activities such as internships, workshops, seminars and other practicum assignments. The variations such as co-operative education and service learning have also become quite popular among students for careers in education, medicine, engineering disciplines, social service etc.
2. Prior Learning Credit- Assessment in form of credits for prior learning forms the second important area of notice in experiential learning.

Credits or certificates may be provided for knowledge and skills attained from life experiences. These are usually in the form of uniform assessments such as College Level Examination Program (CLEP) conducted by the College Board, and portfolio assessments done at college or university level.

3. Individual Development and Classroom-Based Education- This forms the third most important interest area in experiential learning paradigm. It includes teaching techniques involving learners in doing actions and later reflecting on what they did. Case Studies, Role plays, Games, simulations, critical incidents, socio-drama or any other activity using real life experiences may be conducted for overall development of the learner.

Young learners are mainly concerned with action as they want to feel and experience everything. They can become more actively involved learners if the instructor uses variety of tools and techniques to teach the required project knowledge and skills. Learners experience and learn the most when they themselves are involved in doing action and least when they merely listen to theory [20]. Keeping this in view various doing activities can be planned for learners as listed below [20, 2, 23]:

- Recreational Activities
- Educational Games and Simulations
- Educational Tours and Field Trips
- Presentations and Demonstrations
- Student Exchange Programs as a part of global education initiatives and student development programs.
- Interactive Drama and Students Role-Play
- Motivational stories and case studies
- Portfolios
- Imaginative activities and Visualizations
- Story-telling and Group discussions etc.

In recent times, Higher Education institutions have started to use information and communications technologies (ICT) for supporting innovative teaching

and learning activities [24]. This has also led to the emergence of various e-learning tools, such as open source Learning Management Systems (LMS) as an integral part of various universities. A Learning Management System (LMS) is application software used for administration and distribution of e-learning based educational courses and training programs [25]. Not only colleges and universities are using learning management systems to provide online courses but professionals in leading business organizations and corporate training departments are also using these LMSs to impart online training, computerized record-keeping and member registration [25, 26]. The EDUCASE Evolving Technologies Committee has suggested that the two most popular open source learning management systems are Moodle and Sakai [27]. They are not only used in knowledge dissemination in higher education context but also support experiential learning at varying levels.

In corporate world employers are putting in a significant part of their investments for grooming managers and providing them the required management education. This is accomplished through subject centered programs having specific objectives with focus on experiential learning paradigm. Business organizations and industry are extensively employing experiential models that enable development with attainment of self-knowledge. The three most accepted forms of experiential learning as in business world namely Action Learning, Outdoor Education and Future Search [22]. The approach of action learning enables participants to utilize their acquired knowledge and skills to handle real time problems at their workplace. The methodology accelerates organizational learning process in participants and even empowers managers to systematically resolve challenges with no previously defined solutions. Action learning procedure defines three major components i.e. problems identified by members; members taking charge for performing action on the subject; and associates supporting the problem resolving process. The stake holders such as functional experts, specialists who design formal training modules and instructor play significant role in the overall learning process. Thus, the term action learning offers limitless potential to the corporate world, institutions,

and businesses facing constant changes. Traditional tactics for professional advancement entail attending business conferences, seminars, listening to appealing speakers and eminent authors [22]. Future Search enables organizations and individuals to participate together to discuss how to react to the psychological pressure due to constantly occurring changes in present and future. Future Search process enfolds understanding, insights development, learning from others and revealing new opportunities. Nowadays, organizations are resorting to outdoor challenge activities for promoting teamwork and improving communication to increase the efficiency of work groups. *Al fresco* management training of employees or simply outdoor experiential learning stresses on process and not content.

Conclusion

The dynamic and holistic process of learning involves the incorporated performance of attributes such as thoughts, sense, perception and behavior. It encourages the qualities of innovation, decision making and problems solving. Learning is not an independent process rather it results from synergetic communication of the learners with their environment. Learner's preferences and judgments may influence his future selection and can also establish the series of events he may encounter. The philosophies proposed by Kurt Lewin, John Dewey and David Kolb act as the groundwork to improve current education and learning processes and future research works. Though student is the center of focus for experiential learning paradigm but teacher and his teaching tactics play a very significant role for successful learning. The teacher must not just direct but facilitate and motivate students by using innovative tools and methods to generate their interest in the topic of study. Students should be involved completely in the learning process so that they not just learn but get fully immersed in the experience. The skills and knowledge they acquire will benefit them in their future preferences and decision making process. Different pedagogies followed for experiential learning include Internships, Live Case Studies, Seminars, Conferences and most importantly Computer Based Learning each with its own set of

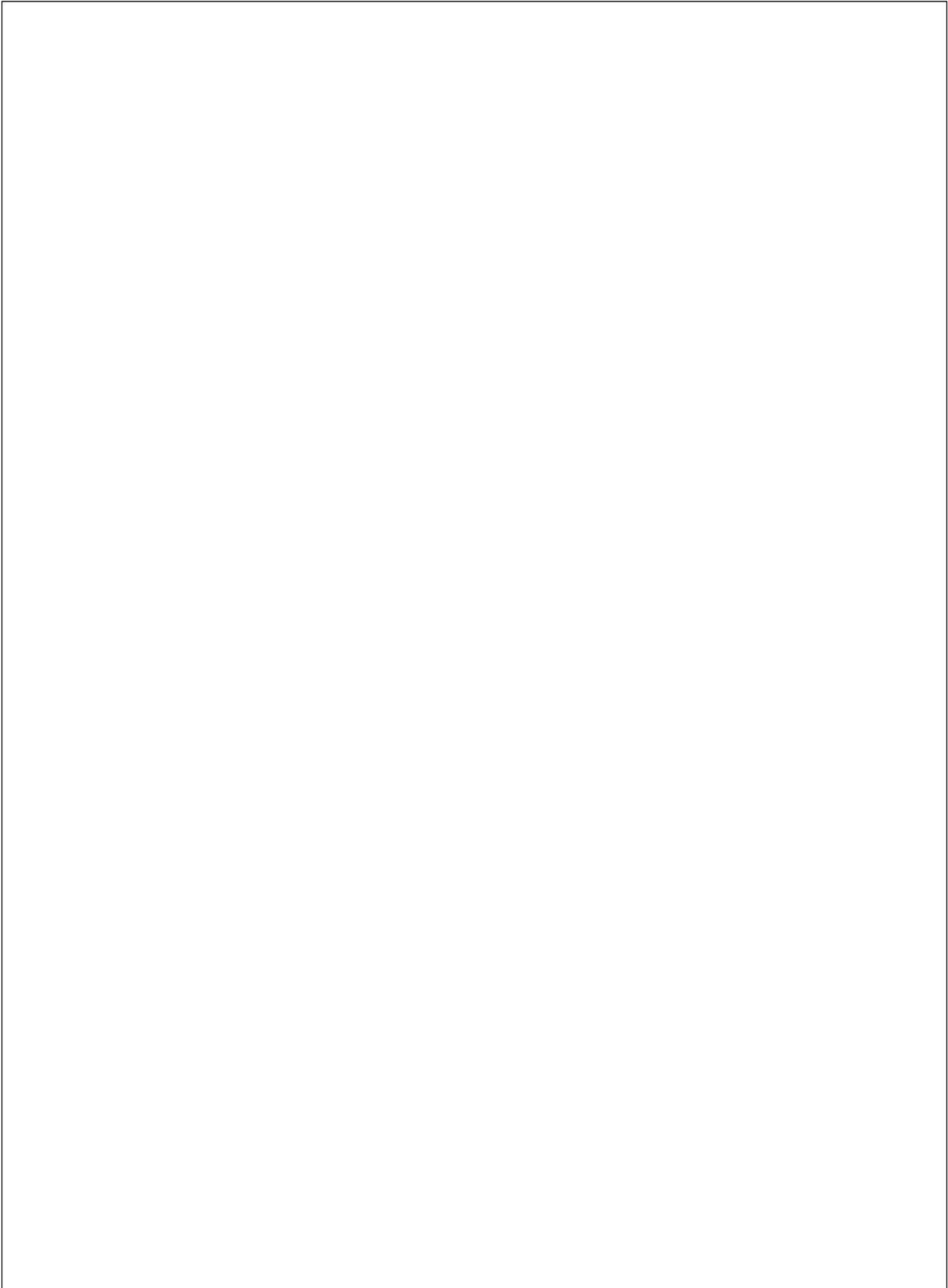
advantages and disadvantages. There are two important matters of concern that need attention. Firstly, the concept of 'Experiential Learning' is generally talked in context of higher education and professional training but it is important to note that the concept should be promoted in school education system as well. Young minds are raw minds thus, the more they feel or experience and indulge with the subject their innovation can reach heights. Secondly, to ensure successful experiential learning teacher's role is very crucial and so is teacher's training. An instructor

or teacher must be trained to use experiential learning tools and techniques and should be well able to integrate them with other conventional teaching methods. This training could be imparted to teachers through workshops, faculty development programs, training sessions etc. Thus, we conclude that if integrated carefully with traditional teaching techniques, 'Experiential Learning' approach could work wonders but at the same time it needs much research work to be done to fully incorporate it in current education system.

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