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A critical study of Employee Empowerment Initiatives in selected organizations

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ABSTRACT: The recent changes and fluctuations in the economic trends around the globe have increased the need for better and improved functioning of the organizations to deal with contingent situations. Thus organizations and their managers tend to change their mindsets and need to engage themselves in broad-based thinking, visualizing, and nurturing accompanied by the best use of the knowledge and creativity of employee’s. To fulfill this aim the best philosophy is to empower employees thus enabling them to make decisions about their own work and taking responsibility for their results.

KEYWORDS: Empowerment, Decisions, Responsibility

MEANING OF EMPOWERMENT: - Empowerment in simple terms can be defined as giving authority along with required resources to employees to use their own initiatives, such that they are able to make decisions and have the power to implement them. Empowerment does not in the least means that management is no longer responsible for organizations performance rather it is the management which can create trust and best communicate with the employees.

NEED OF EMPLOYEE EMPOWERMENT: - With the changing set ups of organizations and the way they work and function in the same manner the way expectations, methods, beliefs of employees have undergone a drastic change. Employees now feel that they will be able to perform in a much better way if they are more informed and free to include their ideas and ways of doing a task. This is the phase where a need for Employee Empowerment arises in an organization and it aims to initiate an employee empowerment program.

Initiatives undertaken by an organization lays the basic foundation of employee empowerment. Empowerment Initiatives are not just feel good practices but they are and can be more productive practices because they help in problem solving, invoke creativity in employees, increase the self-efficacy of an employee and as a consequence leading to higher job commitments, higher involvement and greater responsibility towards work. These initiatives can be in form of a small step like information sharing, using the twenty foot rule, suggestion program or scheme, coaching employees, building up of informal participative decision-making programs with an option of receiving feedback, self-managed teams, and job enrichment. These initiatives can take a bigger shape in the form of setting up of Quality Circles, Total Quality Management, Profit Sharing or Employee Stock Option Plans (ESOP’s).

APPROACHES/ PERSPECTIVES/WAYS TO EMPOWER EMPLOYEES: - An organization can adopt any of the following approaches to empower their employees with a view to increasing the efficiency and effectiveness of the employees and the organization as a whole.

The range and the level of implementation of these initiatives depend on management’s perspective towards employee empowerment at workplace. These perspectives can be categorized in to social-structural perspective which states empowerment is where power resides in individuals at all levels of a system and changes in organizational policies, practices, and structures can be made so as to increase the involvement of employees. According to the psychological perspective empowerment refers to a set of psychological conditions which enhance the personal efficacy of an employee. Lastly, the Critical and postmodern empowerment theorists contend that empowerment should be in the form of giving power to others and this cannot be achieved in absence of the formal power structures of direct worker ownership and representation because real power still resides at the top of the organization.

Causes/ Reasons behind the failure of Empowerment Initiatives: - One of the main reasons behind the failure of most of the Empowerment Initiatives is the basic thought which is a part of culture of most of the organizations the “the boss is always right”. This mind set of both the employer and employee leads to the establishment of a weak foundation of the Empowerment Initiative that an organization wishes to establish or imibe.

The other probable reasons behind the failure of initiatives in an organization may be the lack of interest on the part of the management, absence of acceptability on the part of the employees due to factors like low self-esteem or due to external or internal locus of control (Stephen P. Robbins, 2003)

Not only the above said but there are and may be various other factors which lead to the failure of Empowerment Initiatives in an organization.

2.) Purpose of this study:-
The purpose or objectives of this study are:-
1) To gain insight as to which methods or initiatives an organizations adopt to empower its employees and its impact on an organization.
2) To know the attitude and perceptions of employees towards empowerment
3) To bring to light the various causes & reasons of failure of Employee Empowerment Initiatives and challenges related to the implementation and functioning of the same.

3.) HYPOTHESIS FOR THE STUDY: -
The focus is to study the relationship between various independent variables like the power of self efficacy of an employee, organizational structure, organizational culture, Vision, Mission and Values with that of a dependent variable like the acceptability and success of an employee empowerment initiative.

The hypothesis for the study are as under:-
1) Whether self-efficacy of an employee is an important factor in success of Employee Empowerment Initiative.
2) Whether organizational structure is a hurdle in the success of Employee Empowerment Initiatives
3) Whether organizational culture is an obstacle in the success of Employee Empowerment Initiatives
4) Whether the Vision, Mission & Values of an organization aid better & successful implementation of an Empowerment Initiative.

4.) BRIEF REVIEW OF THE WORK ALREADY DONE IN THE FIELD:-
Empowerment has always been expected to be bring along with it effectiveness and efficiency in an organization. The studies carried out on empowerment have always defined empowerment as a way which keeps employees more informed and an environment that gives them freedom to take decisions as related to the tasks in hand so that they demonstrate more of
accountability and develop a spirit of initiation in the work they perform. Research reveals the fact that the traditional perspective of employee empowerment was a employer driven approach in which focuses on providing an empowered climate to the employee by building relationships, sharing authority, providing feedback and developmental opportunities and above all trusting employees thereby making them feel empowered with time.

According to a study carried out by Seibert, Silver, Randolph (2004) in which they studied seven hypotheses the traditional approach of empowerment has a drawback that it does not empower a high percentage of employees. Thus, their study came out with a new dimension added to the old approach which is termed as the power of self efficacy of employees. This dimension states that the behaviour of an employee is influenced by what they see around them, observe the changing behaviours of other employees and management and then themselves direct towards a way of thinking that encourages them to behave in an empowered manner.

It has been found that Empowerment Initiatives like Quality Circles have been successfully implemented in Japan in the early 1960’s and in our country too it has been implemented in Mahindra & Mahindra, BHEL, Godrej to name a few. Another initiative of empowerment in form ESOP’s has and is being implemented in Infosys Technologies, one of best IT firms of the country.

Not only the above mentioned examples, but also new and substantial amount of research has been carried out for better understanding of empowerment and its initiatives.

5. NOTE WORTHY CONTRIBUTIONS IN THE FIELD OF PROPOSED WORK

The present day concept of employee empowerment or an outcome of research and contributions made by practitioners and theorists over a period of time. Different theorists contributed their ideas in their own ways and even defined the concept of empowerment in varied forms like empowerment has been described as a venue to enable employees make decisions and also as a personal experience where individuals take responsibility for their own actions. The credit of laying down the foundation of empowerment at workplace through various perspectives goes to contemporary management scholars and practitioners like Conger and Kanungo, Thomas and Vellehouse, Spreitzer, Kanter, Boje & Rosalie, Wendi (2007) and others to name a few.

The authors, Ken Blanchard, John P. Carlos, and Alan Randolph in their book Empowerment Takes More Than a Minute, brought to light three key ways to implement and initiate empowerment initiatives to empower employee’s. These include sharing information with everyone, creating autonomy through boundaries and replace the old hierarchy with self managed teams. Findings of research done by practitioners and theorists namely, Aryee and Chen, Carless, Sparrowe, Kirkman & Rosen, Spreitzer, Kizillos & Nason,(2005) and others contributed to the study of benefits of employee empowerment in form of high job satisfaction for both individual and teams, higher levels of organizational commitment, lesser rates of turnover and less job strain.

The recent study by Cyboran, 2005 offers insight as to how individuals may enable their own empowerment. It focuses on the role of reflection in sustaining psychological empowerment, particularly during difficult times.

Also, the study carried out by Seibert, Silver, Randolph provided a broader and a much better way to making empowerment easier to accept by employees because they change by self motivation and thus adding pace and longer stability to employee empowerment initiatives in an organization. Apart, from this another advantage of this study was that when employees develop a sense of self-efficacy it lessens the cost incurred by an organization to make its employees accept empowerment initiatives. The note worthy contributions made by scholars and practitioners has thus laid the basis for further studies and research on Empowerment and Employee Empowerment.

6.) PROPOSED METHODOLOGY DURING THE TENURE OF THE WORK

COLLECTION OF DATA AND METHODS OF COLLECTION OF DATA:- The study shall be based on both primary and secondary data collected from various research reports, journals and articles. For collection of the primary data two different questionnaires will be prepared as follows:-

• For Managers/ Heads of various departments in the organization.
• For the subordinates working in various departments.

The questionnaire will be so framed that it may cover and help in collection of varied views of managers and their subordinates working within the organization. Along with this discussions and interactions with the employees of these organizations will be an important source of data.

Sample: - The sample collected for the study will be collected from government and private organizations in the state of Madhya Pradesh.

SAMPLE SIZE & SAMPLING TECHNIQUE:- The sample size for the study will be of 200 employees in total. Selection of Sample shall be based on Convenient Sampling from companies. Analysis of the collected data:- The nature of the study is such that besides the statistical tool scaling technique will also be required to be used. The data so collected will be tabulated, analyzed and then findings and inferences shall be drawn.

For literature review concerning the subject of the study is very scanty and that too is not easily available. There are many studies conducted on Employee Empowerment but most of them relate to international organizations in other countries. Some of which in the context of Indian workplace environment are missing in the review which is in itself a limitation of this study at least for present.

7) EXPECTED OUTCOME OF THE WORK

The present study seeks to bring to light the increased need of empowering employees in present day competitive environment when an organization has to meet the demands for lower costs, higher performance and employee satisfaction to retain its workforce. The study would Highlight the view as to how initiating employee empowerment an organization can earn the trust and commitment of its employees the minimizing strain on tasks performed.

The main focus of the study will be to highlight as to which and how empowerment initiatives and techniques are implemented in organizations. Also an attempt is made to bring to light the reasons and factors due to which employee empowerment programs are undergoing failure or are facing less acceptability by the employees of organizations.

Apart from the above mentioned the focus is to study the relationship between independent variables like the power of self efficacy of an employee, organizational structure, organizational culture, Vision, Mission and Values with that of a dependent variable like the acceptability and success of an employee empowerment initiative.

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- Article
- Handbooks
Assessment of Nutritional status of School going girls, Development & Impact of Nutritional Games on Enhancement of Knowledge Pertaining Nutrition with Reference to Bijnor (U.P.)

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ABSTRACT
Malnutrition has an effect on children’s well being and their ability to learn & play normally; therefore healthy food choices may prove a child’s well being & ability to learn and play normally. The dietary habits in childhood impact directly on growth, development and prevalence of disease throughout the life cycle. Healthy eating habits should, thus, established during childhood.

The quality of children’s diet usually declines as they move from childhood to adolescence. Healthy eating is usually not a priority for adolescents, and poor eating patterns may thus add a risk for current and future health problems.

The school going girls is in a state of process of growing up from puberty to maturity. Adolescent account for 1/5 of the world’s population and in India they account for 22.8% of total population. They are tomorrow’s adult.

Their growth and development is closely linked to the diet they receive during childhood. They may represent a window of opportunity to prepare nutritionally for a healthy adult life. They have to encounter a series of serious nutritional challenges not only affecting their growth and development but also their livelihood as adults. Thus it is not surprising that girl population who are “mother to be” is considers as the most important section on which the future of nation depends.

A large number of school based nutrition programmers have been implemented globally on obesity, the importance of activity and of vegetables & fruits in the diet. It is much more important to improve nutrition knowledge through nutrition education in order to have a positive influence on healthy food choices.

Number of children in India particularly girls live under suboptimal conditions marked by poor nutritional status and high level of morbidity and mortality.

In developing countries, factors associated with under nutrition of girls are poor household economic condition, periodic food shortage, burden of diseases, poor knowledge about long term consequences of under nutrition, quantity & quality of food and access to health and nutrition services.

Girls have mere easy access to health and nutritional information through schools, recreational activities and mass media than they have later in their lives. Particularly, health and nutrition education and healthy habits of female adolescents will have critical roles to play in maintaining future family health and nutrition.

The focus of this project is to determine the nutrition knowledge and nutritional status of school going girls attending purposively selected public school in district Bijnor (U.P.).

KEYWORDS: Malnutrition, Children, Healthy adult life, disease with food group, dietary patterns

Objective:
1) To assess the nutritional status of primary, middle, high & higher secondary school going girls.
2) To compare the nutritional status of different age and levels of education.
3) To study the dietary patterns, habits & foods used by the school going girls.
4) To study the misconcepts and food fads.
5) To study the causes of nutritional deficiency disease.
6) To relate the nutritional disease with food group & specific nutritional deficiencies.
7) To study the availability of type of food in the study area.
8) To develop the nutritional games for enhancing nutritional knowledge according to educational level.
9) To study the impact of nutritional games on enhancement of nutritional knowledge.

Brief review of literature
Research is an original contribution to the existing stock of knowledge making for its advancement. It’s the pursuit of truth with the help of study, observation, comparison and experiment. The primary objective of review of literature is to imbibe understanding of previous work that has been done in subject with focus explored aspect of the problem. The important steps in the planning of any research journals, books, dissertation, thesis & other sources of information on the problem to be investigated. (Kothari, 1999)

Assessment of nutritional status of community is one of the first steps in the formulation of any public health strategy to combat malnutrition. The principal aim of such an assessment is to determine the type, magnitude and distribution of malnutrition in different geographic areas, to identify the at risk groups and to determine the contributory factors. (Bamji, 2004)

Anaemia is a major global problem affecting between 20- 70% of the population in various countries. The disease is of particular significance in preschool & school children because of high prevalence (50-70%) & the adverse functional consequences. In school children, anemia impairs scholastic performance & in young women, the reproductive performance. (Bamji, 2004)

Obesity during childhood is a significant risk factor for chronic disease during adulthood. Adolescent often have irregular pattern of working, studying, sleeping and eating. Healthy regular meals are often replaced with fast foods consumed outside the home. The more meals that are eaten outside the home, the higher risk of obesity. (Mann & Truswell, 2007)

Adolescence is a time of rapid growth and transition from childhood to adulthood. Adolescent girls are often at nutritional risk. They need extra care to avoid nutritional deficiency, especially of iron & iodine because of menstruation and this time of rapid growth, respectively. WHO estimates that more than 1.9 billion individuals have inadequate iodine nutrition & almost 300 million of these are school aged children. (Mann & Truswell, 2007)

Obesity amongst adolescents is responsible for carrying weight-related risks like cardiovascular diseases into adulthood. An Indian study has shown that obese adolescents are more likely to develop hypertension later in life as compared to their leaner counterparts. Overconsumption of calories, especially fast food, snacks and soft drinks were contributing factors resulting in obesity and female adolescents were more prone to this as compared to males.

Adolescents, particularly girls, are especially vulnerable to iron deficiency due to low intake and absorption of iron, and increased iron requirements for growth and replacement of menstrual blood losses (Brablin and Brablin,1992).

Children and adolescents of urban families are more overweight than in the past, possibly because of decreased physical activities,
sedentary life style, altered eating patterns and increased fat content of the diet. Increase in sedentary activities, such as television viewing and computer games, is suspected to be responsible for the decline in physical activity levels. (Wang et al, 2002) 

Noteworthy contributions in the field of the proposed work:-
A food consumption survey among adolescents found that energy intake was between 1104—1238 Kcal, far below the recommended allowance. Low energy intake was associated with food habits of not having breakfast among adolescent and school-age children due to factors such as workload of parents and availability of street food near school. The studies recommended the importance of nutrition education to school children and street food vendors on hygienic food preparation and nutrition. (Sunarno and Untoro, 2002) 

Another study in Assam reveals a high prevalence of malnutrition among the school age children of tea garden workers of Assam and nature of malnutrition indicates that causes of malnutrition are not only recent but also long term deprivation. Urgent steps should be taken to improve nutritional status of children. Poor nutrition of children not only adversely affects the cognitive development of children, but also likely to reduce the work capacity in future. (Medhi JK etal,2006) 

Adequate nutritious and balanced diets along with maintenance of health are the chief requirements in a society. There was significant improvement in the nutritional knowledge of the subjects after nutrition education. Hence, it can conclude from the present investigation that nutrition education is an important measure to improve dietary habits and food choices of the adolescent girls, as poor dietary habits and ignorance are the main reason for poor nutritional status of the adolescent girls. It would not only improve the health of adolescent girls, but future generation will also influenced, as adolescent girls are would be mothers. (Gupta N & Kochar G.K,2009) 

According to another study by Shrhari ji et al (2007) Nutritional problems in school going girls like anaemia prevalence (hemoglobin concentration <120 g/L) ranged from 19 to 88% across five different cities in India. Other micronutrient deficiencies including, folate, riboflavin, niacin, vitamin C, vitamin A, and vitamin B12 were also present based on biochemical parameters in one study and clinical signs of deficiency in three other studies. Overweight and obesity were prevalent among 8.5-29.0% and 1.5-7.4% respectively among school children, as indicated by 11 studies. Predominant components in children's diet were cereals and pulses, followed by milk and milk products; the fruits and vegetables component was comparatively lower. 

A high prevalence of anaemia among the urban girls of Ahmedabad slums was alarming looking to the grave consequences of anaemia. The association of anaemia with various risk factors is also established by. now. The present study highlights the need to develop pragmatic intervention programmes incorporating various strategies to improve dietary intake and bioavailability of iron; nutritional supplementation of iron and folic acid tablets and fortification of edible dietary items with iron. (Verma .A etal)

Methodology:-
1. Sampling and design of the study:-This study will be conducted cm representative group of school going girls of primary school, middle, high school, higher secondary school. The samples will be selected by random sampling technique in the schools of Bijnor district.
2. Tool for the study:-
A KABP (knowledge, attitude, belief, and practices) questionnaire will be created considering the important aspect of nutrition. 
(a)Questionnaire:-
A reliable dietary questionnaire on food habits, eating behavior, and nutrition knowledge will be constructed, (b) Twenty four hours recall sheet:- The twenty four hours food is analyzed for 3 days using a transfer sheet of each subject to detect whether each subject is achieving the RDA for each food group.
3. Anthropometric measurements:-
- Height & weight will be measured with approximately accuracy.
- BMI (body mass index) will be calculated by dividing the weight in kg by the square of height in meters.
- Triceps skin fold will be measured with nearest accuracy.

Nutritional games:- Nutritional education will be imparted through nutritional games. The nutritional education will be imparted by special regular session for a period of months to the girls. The topics chosen for the study will be balanced diet, anemia, sanitation & hygiene, dietary habits, obesity, & about various methods of cooking appropriate for retaining maximum nutrients etc.

5. Monitoring the effect of nutrition education
Before imparting nutrition education, the level of nutritional knowledge possessed by respondents will be pre & post tested by filling the questionnaire.

6. Statistical analysis of data:-
Statistical calculation will be applied on data by standard procedure.

7. Area of the study:-
The area of the study, where we intend to study the nutritional status & imparting nutrition education are of district Bijnor (U.P). This area can give us a peep into problems faced by school going girls and we can also assess our objectives through these area.

Expected outcome of the proposed work:
Assessment of nutritional status of community is one of the first steps in the formulation of any public health strategy to combat malnutrition.

- The nutritional status of school going girls will determine the type, magnitude & distribution of malnutrition in target group
- It will determine the contributory factors of malnutrition in the study area.
- Food intake data obtained through diet survey will provide a base for nutrient adequacy & susceptibility to disease.
- The clinical examination will provide the information about the nutrients responsible for the appearance of specific deficiency signs.
- Nutritional games will promote a positive attitude towards health, good food practices, good nutrition habits and hygienic factors which will play a major role for proper growth, development & work capacity in later life.
- The availability of food provide the knowledge of food distribution system, that can be used at official levels
- The study of misconcepts and food fads will made a necessary data to make further nutritional programmes and policies.

These expected outcomes emphasize the need for nutritional intervention, and suggest that, in addition to using nutritional assessment, it is necessary to impart nutrition education, so that a larger number of girls with malnutrition and/or at an increased risk for developing malnutrition may be identified and correctly managed.

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A STUDY OF FUZZY METRIC SPACES AND INTUTIONISTIC FUZZY METRIC SPACES.

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ABSTRACT: Mathematical deduction is not useful to the physicist if interpreted rigorously. It is necessary to know that its validity is unaltered when the premise and conclusion are only "approximately true". But the indeterminacy thus introduced, it is necessary to add in criticism, well invalidate the deduction unless the permissible limits of variation are specified.

The same need was expressed by L.A. Zadeh in 1962. There is fairly wide gap between what might be regarded as "animate system theorists at the present time, and it is not at all certain that this gap will be narrowed, much km closed, in the near future, there are some who feel this gap reflects the fundamental in a adequacy of the conventional mathematics - the mathematics of precisely defined points, functions, sets, probability measures, etc. for coping with the analysis of biological systems and that to deal effectively with such systems, which are generally orders of magnitude more complex than man-made systems, we need a radically different kind of mathematics.

The mathematics of fuzzy or cloudy quantities which are not describable in terms of probability distributions. Indeed the need for such mathematics is becoming increasingly apartment even in the realm of inanimate systems, for in most practical cases the prior data as well as the criteria by which the performance of a man-made system is judged are far from being precisely specified or having accurately known probability distributions.

KEYWORDS: Fuzzy metric spaces, intuitionistic fuzzy metric spaces

INTRODUCTION:

In the year 1921 * Albert Einstein made a statement "So far as laws of mathematics refer to reality, they are not certain, and so for as they are certain, they do not refer to reality".

To bridge the gap between a mathematical model and experience, first of all, American philosopher Max Blank in the year 1937 gives us the following:

"It is a Paradox, whose importance familiarity fails to diminish, that the most highly developed and useful scientific theories are ostensibly expressed in terms of objects never encountered in experience. The line traced by a draftsman, no matter how a accurate, is seen beneath the microscope as a kind of corrugated trench, for removed from the ideal line of pure geometry, And the "Point Planet" of astronomy, the "Perfect gas" of thermodynamics, or the "Pure Species" of genetics is equally remote from exact realization indeed the unintelligibility at the atomic or subatomic level of the notion of rigidly demarcated boundary shows that such objects not merely are not but could not be perfect objects, the experimental scientist observes objects of which the properties demanded by theory are and can, in the very nature of measurement, be only approximately true.

To do so, however, replaces the original mathematical deduction by a more complicated mathematical theory in respect of whose interpretation the some problem arises, and whose exact nature is an any case unknown, this lack of exact correlation between a scientific theory and its empirical interpretation can be blamed either upon the world or upon the theory. We can regard the shape of an orange or a tennis ball as imperfect copies of an ideal from of which perfect knowledge is to be had impure geometry, or we can regard the geometry of spheres as a simplified and imperfect version of special relations between the members of a certain class of physical objects. On either view there remains a gap between scientific theory and its application which ought to be, but is not. bridged, to say that all language (symbolism, or thought) is vague is a favorite method for evading the problems involved and lack of analysis has the disadvantage of tempting even the most eminent thinkers into the appearance of absurdity. We shall not assume that "laws" of logic or mathematics prescribe modes of existence to which intelligible discourse must necessarily conform.

It will be argued on the contrary, that deviations from the logical or mathematical standards of precision are all pervasive in symbolism; that to label then as subjective aberrations sets an impassable gulf between formal laws and experience and leaves the usefulness of the formal sciences an insoluble mystery".

But in the year 1965, L.A. Zadeh proposed the new paradigm based on the concept of a fuzzy sets which was initially ignored, ridiculed or attacked by many, while it was supported by a few, mostly young and not influential. In spite of initial lack of interest, skepticism, it gained some support in 1970 and began to demonstrate its superior pragmatic utility in the 1980 and is still going on and will likely take much longer than usual to complete it.

It defects the foundation of science, which is based on the Aristotelian two-valued logic viewed as inviolable. There are the following features, which make this paradigm superior to the classical paradigm.

1. The new paradigm allows us to express irreducible observation and fuzziness uncertainty in their various manifestations and make these uncertainties intrinsic to empirical data. Such data, which are based on graded distinctions among states of relevant variables, are usually called Fuzzy data. When Fuzzy data are processed, their intrinsic uncertainties are processed as well, and the results obtained are more meaningful, in both epistemological and pragmatic terms, than obtained by processing the usual crisp data.

2. The new paradigm offers far greater resources for managing complexity and controlling computational cost. More complex the problem involved, the greater the superiority of Fuzzy methods.

3. The new paradigm has considerably greater expressive power, consequently, it can be effectively deal with a broader class of problems. In particular, it has the capability to capture and deal with meanings of sentences expressed in natural languages. This capability of the new paradigm allows us to deal in mathematical terms with problems that require the use of natural language.

4. The new paradigm has a greater capability to capture human common-sense reasoning, decision-making and other aspects of human cognition. When employed in machine, design, the resulting machines are human-friendly.

Hence the concept of fuzzy sets was first given by Zadeh [44] in 1965. Thereafter, the concept of fuzzy metric space has been introduced and generalized in different ways by Deng [14], Erceg [19], Kaleva and Seikkala [25], Kramosil and Michalek [26],
George and Veeramoni [21], etc. It has also been shown that every metric induces a fuzzy metric.

After the introduction of fuzzy sets by Zadeh [44] in 1965 and fuzzy topology by Chang [9] in 1967, several researches were conducted in the generalizations of the notions of fuzzy sets and fuzzy topology. The concept of intuitionistic fuzzy set was introduced by Atanassov [2], [3] as a generalization of fuzzy sets. In the last 20 years various concepts of fuzzy mathematics have been extended for intuitionistic fuzzy sets. In 1997 Coker [12] introduced the concept of intuitionistic fuzzy topological spaces. Recently many fuzzy topological concepts such as fuzzy-compactness [13], fuzzy connectedness [42], fuzzy separation axioms [6] and fuzzy metric spaces [38] have been generalized for intuitionistic fuzzy topological spaces.

Motivated by the potential applicability of fuzzy topology to quantum particle physics particularly in connection with both string and e (co) theory developed by El Naschie [15], [16], Park introduced and discussed in [30] a notion of intuitionistic fuzzy metric spaces which is based both on the idea of intuitionistic fuzzy set due to Atanassov [4] and the concept of fuzzy metric space given by George and Veeramani [21]. Actually, Park's notion is useful in modeling some phenomena where it is necessary to study relationship between two probability function's. It has direct physics motivation in the concept of the two slit experiment as foundation of E-infinity of high energy physics, recently studied by El Naschie [17], [18].

Alaca et. al [1] using the idea of intuitionistic fuzzy sets defined the notion of intuitionistic fuzzy metric space as Park [30] with the help of continuous t-norms and continuous t-conorms as a generalization of fuzzy metric space due to Kramosil and Michalek [26], Further they introduced the notion of Cauchy sequences in intuitionistic fuzzy metric spaces.

Our aim is studied the basic properties of metric space in the setting of fuzzy metric spaces and intuitionistic fuzzy metric spaces, and we will prove some common fixed points theorems in fuzzy metric spaces and intuitionistic fuzzy metric spaces.

A brief review of the work already done in the field:
The concept of fuzzy sets was first given by Zadeh [44] in 1965. Thereafter ' the concept of fuzzy metric space has been introduced and generalized in different ways by Deng [14], Erceg [19], Kaleva and Seikkala [25], Kramosil and Michalek [26], George and Veeramani [21].

It has also been shown that every metric induces a fuzzy metric. Many authors have proved, extended, generalized and fuzzified some known results in fuzzy metric spaces. The most interesting references in this direction are Cho [10], Cho, Pathak, Kang and Jung [11], Deng [14], Erceg [19], Fang [20], Grabiec [22], George and Veeramani [21], Kramosil and Michalek [26], Sharma [34], Sharma and Deshpande [35], Sharma [36].

In 1997, Singh and Chouhan [37] generalized the result of fuzzy metric space and proved an interesting result with examples on fuzzy metric space.

The concept of intuitionistic fuzzy set was introduced by Atanassov [2], [3] as a generalization of fuzzy sets. In 1997 Coker [12] introduced the concept of intuitionistic fuzzy topological spaces. Recently many fuzzy topological concepts such as fuzzy compactness [13], fuzzy connectedness [42], fuzzy separation axioms [6] and fuzzy metric spaces [38] have been generalized for intuitionistic fuzzy topological spaces. Park introduced and discussed in [30] a notion of intuitionistic fuzzy metric spaces which is based both on the idea of intuitionistic fuzzy set due to Atanassov [4] and the concept of fuzzy metric space given by George and Veeramani [21].

Alaca et. al [1] using the idea of intuitionistic fuzzy sets defined the notion intuitionistic fuzzy metric space as Park [30] with the help of continuous t-norms and continuous t-conorms as a generalization of fuzzy metric space due to Kramosil and Michalek [26]. Some other references in the direction of intuitionistic fuzzy metric spaces are Gregory, Romaguera and Veeramani [23], Sadati and Park [31], Kutukcu and Sharma [29], Turkoglu [40], Turkoglu, Alaca, Cho and Yildiz [41], Yildiz, Sharma and Kutukcu [43], Hosseine, Regan, and Sadati [24].

NOTEWORTHY CONTRIBUTIONS IN THE FIELD OF PROPOSED WORK:
The development and rich growth of fuzzy metric spaces and intuitionistic fuzzy metric spaces in last few years were due to worthy contribution of several authors. Especially Deng [14], Erceg [19], Kaleva and Seikkala [25], Kramosil and Michalek [26], George and Veeramani [21], have introduced and generalized the concept of fuzzy metric space in different ways. Atanassov [2], [3] introduced the concept of intuitionistic fuzzy sets, which is a generalization of fuzzy sets. Recently, Park [30] introduced the notion of intuitionistic fuzzy metric space using the concept of intuitionistic fuzzy sets. Alaca, Turkoglu, yieldiz [1] defined the notion of intuitionistic fuzzy metric space due to Kramosil and Michalek [26] and extended well known fixed point of Banach and Edelstein to intuitionistic fuzzy metric spaces. Atanassov [5] defined norms and metrics over intuitionistic fuzzy sets. Sharma and Tiwari [33], Kubiacyzk and Sharma [27], Kubiacyzk and Sharma [28], for the first time introduced the concept of multi-valued mapping in fuzzy metric spaces and established some results.

Kutukcu and Sharma [29], Yildiz, Sharma and Kutukcu [43], studied the concept of intuitionistic fuzzy metric spaces and its applications.

PROPOSED METHODOLOGY DURING THE TENURE OF THE RESEARCH WORK:
We will study the work already done in the field by authors of India and abroad. In order to achieve the target, will study many previous research papers and thesis and also visit many libraries and will discuss problems with researchers working on this line. We will collect data and information from online resources on fuzzy metric spaces and intuitionistic fuzzy metric spaces. Expected outcome of the proposed work:

Of course we will establish many new results and improve some recently published problems. I hope that whatever we will learn during the Ph.D. thesis work will be very useful and my research work may be a pioneer work in the field and may leak to the new horizons in mathematical researches. We assure that our work will be of high standard and will be useful to the worker of this line.

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Investigation of ionospheric perturbation due to Seismic activity using satellite and ground based observations

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ABSTRACT:

There is some intriguing research about whether large magnitude earthquakes are associated with ionospheric changes caused by electromagnetic signals released by the crushing of rock and their crystalline structures. If so then ionospheric changes might be a mechanism for major earthquake prediction. Prior to some recent quakes, scientists have detected electromagnetic and other disturbances in the ionosphere, the planet’s tenuous envelope of charged particles extending from about 80 to 1000 kilometres up and above “There are definitely hints of something happening in the region of earthquakes before the earth moves”. Says Colin Price a geophysicist at Tel Aviv University Israel. Seismo-ionospheric effects cover a variety of phenomenon starting from the bottom side of the ionosphere (D-layer) to upper ionosphere up to the magnetosphere. This involves the variations of plasma parameters, electromagnetic emissions in a large frequency ranges, perturbations of ionospheric layers, anomalies recorded in the VLF transmitter signals, night airglow observations etc. There appear macroscopic changes in the ionospheric parameters above future epicenters prior to the occurrence of earthquakes. They are the variation of ion composition, electron concentration, scale height, electron temperature etc which could be measured, experimentally from ground and various experiments onboard satellites. The lithosphere-atmosphere-ionosphere coupling is a very complicated subject involving a lot of physical effects and the interactions on all levels starting from underground up to the earth’s ionosphere. There is a natural divide in the subject reflected in the existence of two groups of scientists. One of them is involved in studies of seismo-electromagnetic phenomena expressed mainly in electromagnetic emissions and fields associated with seismic activity and another one dealing with ionospheric and space plasma variations observed before and after the earthquakes. The earth’s ionosphere is composed of partially ionized gases that envelop the earth and its regular behavior is interpreted in terms of solar and geomagnetic activity.

KEYWORDS: Disastrous earthquakes, satellite, satellites orbits, Electromagnetic wave

INTRODUCTION

Disastrous earthquakes happening 100 to 200 times each year are a permanent menace to every second resident of our planet. Understanding the earthquake corollary and mitigating earthquakes hazards is a topic of both increasing potential for scientific advancement and social urgency. A large portion of world’s population inhabits seismically active regions including the regions of India, Pakistan, Afghanistan, Turkey, Japan, Indonesia, Ecuador and other south American regions, Central Mid Atlantic Ridge etc. volcanic eruptions accompanied with earthquakes and tsunamis (e.g. Sumatra) generated by earthquakes with underwater epicenter should be considered in the same class of seismological events. According to the statistics earthquakes rate first among the natural disasters in the severity of damage and the loss of human life. The tremendous losses suffered by humanity as a result of sub-surface forces confer upon a great urgency to search reliable precursors of earthquakes.

When an earthquake strikes thousands of people die and millions are left homeless. But what happened in the weeks and days and hours leading up to that horrible event? Were there any signs that such devastation was coming? We think there were, but owing to a satellite malfunction we can’t say for sure. How many lives could have been saved in that?

In the early stages or development, predictions are vague at best. By studying historical accounts of earthquakes monitoring the motion of the earth’s crust by satellite and measuring with strain monitors below the earth’s surface, researchers can project a high probability of an earthquake in a certain area within about 30 years. But short-term earthquakes forecasting just hasn’t worked. Many researchers have detected strange phenomena in the form of odd radio noise and eerie lights in the sky weeks, days and even hours preceding earthquakes. But only recently have experts started systematically monitoring those phenomena and correlating them to earthquakes.

There is some intriguing research about whether large magnitude earthquakes are associated with ionospheric changes caused by electromagnetic signals released by the crushing of rock and their crystalline structures. If so then ionospheric changes might be a mechanism for major earthquake prediction. Prior to some recent quakes, scientists have detected electromagnetic and other disturbances in the ionosphere, the planet’s tenuous envelope of charged particles extending from about 80 to 1000 kilometres up and above “There are definitely hints of something happening in the region of earthquakes before the earth moves”. Says Colin Price a geophysicist at Tel Aviv University Israel. Seismo-ionospheric effects cover a variety of phenomenon starting from the bottom side of the ionosphere (D-layer) to upper ionosphere up to the magnetosphere. This involves the variations of plasma parameters, electromagnetic emissions in a large frequency ranges, perturbations of ionospheric layers, anomalies recorded in the VLF transmitter signals, night airglow observations etc. There appear macroscopic changes in the ionospheric parameters above future epicenters prior to the occurrence of earthquakes. They are the variation of ion composition, electron concentration, scale height, electron temperature etc which could be measured, experimentally from ground and various experiments onboard satellites. The lithosphere-atmosphere-ionosphere coupling is a very complicated subject involving a lot of physical effects and the interactions on all levels starting from underground up to the earth’s ionosphere. There is a natural divide in the subject reflected in the existence of two groups of scientists. One of them is involved in studies of seismo-electromagnetic phenomena expressed mainly in electromagnetic emissions and fields associated with seismic activity and another one dealing with ionospheric and space plasma variations observed before and after the earthquakes. The earth’s ionosphere is composed of partially ionized gases that envelop the earth and its regular behavior is interpreted in terms of solar and geomagnetic activity.

Researchers in many countries, including China, France, Greece, India, Italy, Japan, Taiwan and the United states are now contributing to the data by monitoring known earthquake zones. Using these phenomena for earthquake prediction and ground based sensors.

Satellite data can be obtained from Low Earth Orbiting (LEO), Medium Earth Orbiting (MEO) and Geo stationary (GEO) satellites. The LEO satellites orbits between 500 to 2000 km altitude and visible for 10-20 minutes at a time. The advantage of LEO satellite is that they have low launch cost.
and less propagation delay. GPS satellites are widely used to study the mechanism of ionospheric perturbations during earthquakes by observing the variations in Total Electron Content (TEC) of the ionosphere. GEO satellite orbits the earth above the equator at a fixed distance of 35,786 km and cover one third of the Earth’s surface at a time. GEO satellite has a disadvantage that the data obtained are contaminated by very strong magnetospheric variations. Therefore among these the LEO satellites and MEO satellites are more appropriate for observing ionosphere in relevance with seismic activity. The Micro - satellite DEMETER (Detection of Electro-magnetic Emissions Transmitted from Earthquake Regions). The scientific payload and the different modes of operation under DEMETER satellite offer a unique opportunity to monitor the ionospheric variations over the earthquakes epicenters. The scientific payload of DEMETER is composed of several sensors, which allows to measures the local plasma parameters including temperature and density of electrons and the ion composition. The Langmuir probe Instrument (ISL) surveys the electron density and electron temperature. The plasma Analysis Instrument (IAF) measures the densities, temperature and bulk velocity of three dominant ion species Hydrogen ion (H+), Helium (He+) and oxygen (CH-) ion. It also measures the electromagnetic waves in frequencies ranging from DC to 4 MHz. Electric field Instrument (ICE) is designed to carry out a continuous assessment of the DC and AC electric fields over a wide frequency range and with a high sensitivity. A three - axis magnetic search coil instrument (IMSC) to measure the three components Of the magnetic field, an energetic particle detector (IDP) and an electronic unit (BANT) constitute the Demeter scientific payload. DEMETER has two science modes of operation a survey mode to collect data all around the earth and a burst mode to collect data above the seismic regions of the world. The ionospheric precursors have been registered before seismic events; the epicenters of the selected seismic events lie in Low and mid latitude regions. The data is observed from different experiments on board DEMETER satellite. This includes the variation of electron density and ion (oxygen ion) composition. These density variations were followed by electrostatic turbulence, which is in Ultra Low frequency (ULF) range. The half orbits of the DEMETER satellite were closely checked so that they were close in time and space to the earthquakes. Ionospheric perturbations had been detected using Global Positioning System (GPS) satellites, by monitoring the variation in the Total Electron Content (TEC); (Shi et al., 2010), studied Anomalous enhancement of ionospheric F2 layer critical frequency and Total Electron Content over low latitude before three major earthquakes in China. Besides satellites the ground based ionospheric sounding technique also plays important part in contributing the study of seismon - ionospheric research. (Gwal et al., 2010; Panda et al., 2010) had found Ionospheric precursors observed during some earthquakes and Study of ionospheric perturbations during turkey - central earthquake of December 20,2007. The critical frequency of the ionospheric F2 layer (foF2), which is the most important and sensitive parameter to examine the ionospheric modifications during earthquakes. (Dabas et al., 2007) had observed Ionospheric pre - cursors over low latitudes during some of the recent major earthquakes. The work proposed in this synopsis is devoted to the study of various ionospheric perturbations surveyed during seismic activity using different satellite and ground based techniques. Every technique has its advantage and drawbacks. The variability of ionosphere during earthquakes can be obtained by different analytical approaches, which varies for different experiments. All these points are considered in the analyses of ionospheric behavior during seismic activity.

Ionosphere in correlation ground based observations are useful in the study of ionospheric phenomena associated with earthquakes. However satellite observations are poised to have a significant impact in this field as many events, even during a short period of time can be studied. A coordinated study of satellite and ground based observation is required. The need is to have more observation and also observations with more parameters measured at the same time. In order to encourage studies related to large number of earthquakes and related phenomena simultaneously, the DEMETER micro-satellite has been launched, the objective of which mainly includes studies and investigation of the ionospheric perturbations associated with major geophysical hazard such as volcanic eruption and earthquakes (Parrot et al. , 2002). The mission was proposed by LPC/ CNES, France. It is also equipped with instruments to detect the electromagnetic phenomena linked with seismic occurrences.

3. A BRIEF REVIEW OF THE WORK ALREADY DONE IN THE FIELD

Berth satellite and ground based observation are used to study the ionospheric perturbation associated with earthquakes. Using satellite based observation both plasma parameter variations and electromagnetic emission in the ULF/ELF range has been studied in the past Pulinet et al. (2604) studied the variability of electron concentration in the ionosphere measured by ground based ionosondes and GPS receivers around the time of strong earthquakes. It has been detected and statistically proven the several days before the seismic shock the level Of this variability increases at the station closest to the epicenter, a fact that can be regarded as precursory phenomenon. They also studied a statistical analysis of variations in the foF2 critical frequency before earthquakes has been additionally interpreted based on data from Chung-Li ionospheric station (Taiwan). The interpretation is based on the spatial distribution of earthquakes on Taiwan, depending on a source depth. A complicated shape of the ionospheric precursors of earthquakes is also explained on the basis of a developed physical model.

Liu (2000 2004) Silina et al. (2001); Pulinet et al. (1998a, 2004) Pulinet et al. (1998c, 2003a, 2003b) etc; they have found that the macroscopic changes of the ionospheric parameters prior to the occurrence of the earthquake above the epicenter at altitude from about 400 km to about 1000 km in the ionosphere. Devi et al., (2004) observed methods and techniques adopted to examine modifications on these parameters if any due to earthquake preparatory processes at equatorial anomaly crest stations. Gulyaeva et al. (2008) studied instrument technology for quantitative estimates of the ionospheric variability is described. It is based on the ionosonde observations of the F2 layer critical frequency, foF2. Lebreton et al.(2005) studied the DEMETER Langmuir probe instrument ISL has been described in detail and the main instrument operation modes explained. The main plasma parameters that can be reliably extracted from the ISL current-voltage response are the electron temperature and density and the plasma potential. Variations of these three parameters are obtained with a time resolution of 1 s.

Parrot et al. (2006) show in this paper, examples of quite unusual features in waves, plasma or energetic particle fluxes recorded when the satellite was flying over epicenters of future earthquakes. The examples have been automatically selected by a tool of the DEMETER mission center (Lagoutte et al., 2006) which sorts out satellite orbits at a selected distance to epicenters of earthquakes with a magnitude larger than 6.Benghanem et al. (2010) They have investigated of a possible correlation between the variations of ionospheric electron density and the seismic activity while an event is preparing. Sharma et al. (2008) found that some observations and preliminary results associated with seismonogenic ultra low frequency (ULF) emissions. Hayakawa et al. (2010) had analysed the correlation of ionospheric perturbations with earthquakes in the sense of a
possibility of earthquake prediction by means of VLF propagation anomalies. They studied the use of subionospheric VLF/LF propagation anomalies to study seismo-ionospheric perturbations. Nemec et al. (2009) had observed that a systematic study of intensity of VLF electromagnetic waves observed by the DEMETER spacecraft in the upper ionosphere (altitude 700 km). They focus on the detailed analysis of the previously reported decrease of wave intensity shortly before the main shock during the nighttime. Parrot (2010) had shown a new statistical analysis performed on the plasma parameters during nighttime. An algorithm has been implemented to detect crests and troughs in the data before earthquakes. The earthquakes have been classified depending on their magnitude, depth and location (land, below the sea, close to a coast). Hayakawa et al. (2007) had observed that ULF electromagnetic emission is recognized as one of the most promising candidates for short term earthquake prediction. They found convincing evidence on the presence of ULF emissions before a few large earthquakes. Rozhnoi et al. (2008) had observed two methods of the global ionosphere diagnostics using VLF signals received on board the DEMETER satellite in association with two cases of strong seismic activation. Hayakawa (2007) had found that the most promising candidate for this short-term earthquake prediction is recently recognized to be the monitoring of the ionosphere. He proposed the VLF/LF radio sounding for seismo-ionospheric perturbations, and he presented a lot of convincing evidence on the presence of ionospheric perturbations associated with earthquakes on the basis of statistical and case studies. Boudjada et al. (2008) studied the VLF signals radiated by ground transmitters and received on board the DEMETER micro-satellite. They revealed the drop of the signals connected with the occurrence of large earthquakes.

The precursor effects of large magnitude earthquakes in the ionosphere have been reported by many authors (Al, Rashiz et al., 1998; Ondoh, 2000; Silina et al., 2001; Liu et al., 2001; Pulinets and Boyarchuk, 2004; Devi et al., 2004; Liu et al., 2004). Although only few ionosphere scientists are actively doing research in the area of precursor effects of large earthquakes, and still many are suspicious about some reported effects (Rishbeth, 2007), the number of the reports has shown significant increase in recent years. Further the quality of the papers appears to be convincing enough to warrant our credibility on such precursor effects on the ionosphere (Dautermann et al., 2007; Pulinets et al., 2007; Zhao et al., 2008; Liu et al., 2008; Pulinets et al., 2010). Recently the number of reports which use satellite data is increasing (Parrot et al., 2006, Sharma et al., 2006; Oyama et al., 2008; Bankov et al., 2009). In addition to the ionospheric phenomena, VLF anomalies, infrared emission, and particle precipitation have also been reported (Aleskandrin et al., 2003; Ouzounov et al., 2006; Rothkael et al., 2007; Rozhnoi et al., 2007a).

4. NOTEWORTHY CONTRIBUTIONS IN THE FIELD OF PROPOSED WORK

Over the last five years Japan has made an outstanding contribution to the field of Seismo-Electromagnetics through Frontier research projects. They have found much convincing evidence for seismo-ionospheric perturbations that could lead to the establishment of a new science field termed “Lithosphere-Atmosphere-Ionosphere coupling”. These successes have come about through the fruitful collaboration of Japanese and Russian scientists. There are many reports by Japanese scientists on the observation of EM radiation in the VLF range. They have found 29 events, which seem to be earthquake related. The most impressive result was observed by Fujinawa and Takahashi (1995), in association with the great Kurile Island earthquake (M=8.1) in 1994. They observed in Tokyo an increase in the number of VLF pulses before the earthquake, the epicenter of which was from the observing station. In the USRI General Assembly in Kyot (Aug 25-Sep 2, 1993) the problem of ionospheric phenomena associated with f earthquakes was discussed at a special session. Just after this general Assembly, there was held an International Workshop on “EM Phenomena related to Earthquake Prediction” in Chofu Tokyo Japan on Sep 6-8, 1993. It is important to note that many reports presented in this symposium f together with several papers invited by editors were compiled as. monograph; edited by Hayakawa and Fujinawa (1994). This is rather a full collection of more than 60 papers on the recent field of observations in a wide frequency range from DC to higher frequencies and laboratory experiments together with the consideration of theoretical mechanisms and general ideas on earthquake prediction.

There are many reports by Indian Scientists and researchers on the observation of ULF/ELF anomalies detected by DEMETER satellite prior to earthquakes. They have found many events, which seems to be earthquake related. Worth mentioning are the work done by Sarkar et al. (2007, 2010). Some important electric field variations observed prior to two individual earthquakes are discussed, one in Arunachal Pradesh, India (28.87°N, 94.60°E, 20:06:42 hrs UTC) measuring 5.9 and the other in the west coast of Columbia (6.86°N, 77.8°W, 20:50:46 hrs UTC) measuring a stronger 6.2 on the Richter Scale. The anomalies are reported to occur in the ULF/ELF range. The observations have been detected prior to both the events using the low altitude satellite DEMETER (height=710km), which is aimed at studying the ionospheric perturbations related to earthquakes and volcanic eruptions. Last few years India has made an excellent contribution to the field of seismo-Electromagnetic, they have found very convincing evidence for seismo-ionospheric perturbations, which is related to earthquake observed by DEMETER satellite. The most convincing result was observed by Sarkar et al. (2007) observed electron and ion density irregularities simultaneously observed for three earthquakes that occurred in the mid latitude region. These perturbations were recorded by the ISL (Langmuir Probe) and IAP (thermal plasma analyzer) experiments onboard DEMETER. Bhattacharya et al. (2007) had observed the satellite mode of investigation, followed by magnetic field perturbations at the lithospheric level with the help of a ground based measurement system involving a search coil magnetometer. They also studied and analyzed the data from low altitude DEMETER satellite for searching a correlation between electromagnetic perturbations and seismic activities. They studied electric field perturbations are prominently reported in ULF/ELF twice. In the first case anomaly was observed five days before the main shock and a few hours before the main shock during passage of DEMETER above Arunachal Pradesh region. In the second, during the seismic event in the west coast of Columbian region, electric field anomalies in ULF/ELF are reported 8 days before the event. These disturbances are found in the lower band of electromagnetic frequencies, more understandably due to their larger penetration depth as compared with other range of frequencies.

Sarkar et al. (2010) investigated the plasma density disturbances and electric field perturbations associated with China, Sichuan, Wenchuan earthquake of magnitude M=7.9 that occurred on May 12, 2008 at 06:28:01 UTC. They found plasma density disturbances and electric field perturbations associated with China, Sichuan, and Wenchuan earthquake using DEMETER satellite. However many valuable contributions have been provided by researchers from China, France, Italy, Greece, USA, Ukraine, Mexico, Taiwan, Israel, Germany and India.

S. Proposed methodology during research work

Ionospheric perturbations during seismic activity can be studied using various satellite and ground based techniques. The ground based observations have a limitation that they provide a single point measurements therefore the study of seismicity and underlying processes could essentially improved by using satellite methods. Satellite observations are the most suitable for demonstrating and characterizing the various perturbations
observed in ionosphere during seismic activity because they allow the surveying of seismic zones all over the world. The satellite measurement comprises the study of plasma parameters and electromagnetic waves. This includes the in-situ measurement of electron density, ion composition and electromagnetic waves from micro-satellite DEMETER.

(a) SATELLITE OBSERVATIONS:
The DEMETER (Detection of Electro-Magnetic Emissions Transmitted from Earthquake Regions) is the first micro satellite developed by CNES (French National Space Agency) in 1998 for seismic-ionospheric studies. DEMETER satellite was launched on June 29, 2004, from Baikonour (Kazakhstan). The main scientific objective of this satellite is to study the ionospheric perturbations, which are linked to seismic activities. Main parameters of DEMETER satellite: orbit type (Sun synchronous, circular and quasi polar orbit). Altitude (710km), Inclination (98°), Orbit period (100 minutes), and Orbit per day (14(all data are organized per half orbit)).

The scientific payload of DEMETER allows the measurement of electromagnetic waves in broad frequency ranges and the determination of the plasma parameters, ion composition, electron density and temperature. It also measures the energetic electron flux. The scientific payload composed of five instruments, for onboard data processing and handling are measured using several types of sensors. A three-axis magnetic search coil instrument (IMSC) to measure the three components of the magnetic field, four electrical sensors (ICE) in order to measure the three components of the electric field. Two Langmuir probes (ISL) The Langmuir probe Instrument surveys the electron & ion density and electron temperature A plasma analyzer (IAP), plasma analyzer Instrument measures the densities, temperature and bulk velocity of three dominant ion species (H+)/(He+) and (O+) ion. It also measures the electromagnetic waves in frequencies ranging from DC to 4 MHz. An energetic particle detector (IDP) and an electronic unit (BANT) constitute the Demeter scientific payload. The electron and ion density measurements have been downloaded from the DEMETER data web server http://demeter.cnrs-orleans.fr.

The orbit of DEMETER will be LEO (Low Earth Orbit), polar and with an altitude of around 700km. The main scientific objective of the DEMETER experiment is to study the disturbances of the ionosphere due to seismic - electromagnetic effects and due to anthropogenic activities (Power line harmonic Radiation, VLF transmitters, HF broadcasting stations). The payload of DEMETER is composed of several sensors associated to a data processing unit and a large memory in order to record the information all around the Earth independently from a telemetry station.

DEMETER will measure Electromagnetic waves from DC up to 4MHz and plasma parameters. Among these plasma parameters, DEMETER will measure with a Langmuir probe the local electron density and temperature at the altitude of the satellite (~700km). There are two mode of operation:
- a survey mode to record low bit rate data all around the earth; onboard processing is performed to reduce the telemetry flow to 25 kb/s.
- a burst mode to record high bit rate data of 1.7 Mb/s above active seismic regions. The triggering of the Burst mode is automatically realized when the satellite crosses a seismic zone.

(b) Ground Based Observations (Using Ionosonde)
There are various radio techniques used to study the ionosphere but radio sounding of ionosphere using ionosonde is the most common one used. Ionosondes are very helpful in providing information on ionospheric layer parameters, information on Doppler shifts, ionospheric irregularities (Spread F and Sporadic E), their morphology and dynamics, day-to-day variability, magnetic storm time responses etc. Ionosonde data can throw light on various seismic associated phenomena like increase or decrease in critical frequency of the F layer, formation of spread F and sporadic E etc. The present chain of Ionosondes in our Country can contribute to the understanding of several not fully resolved problems of low altitude ionosphere. foF2 and TEC measurements have been downloaded the Ionosonde data from website (http://www.ngdc.noaa.gov/).

The data obtained from satellite and ground based observations will be studied in the light of magnetic storms in order to distinguish the effect of earthquakes on the ionosphere from the effect of magnetic storms on the ionosphere. For this purpose we will consider the Kp index data for the months in which earthquake occurred.

The DEMETER satellite has provided a huge data array to study the variations of electromagnetic emissions; generation of plasma inhomogeneities and other ionospheric phenomena associated with earthquakes and is still in operation. The high sensitivity of the instruments onboard DEMETER has promoted the reliability of this data. The GPS, TEC technique is also a very powerful tool of studying the ionospheric phenomena associated with earthquakes. The TEC observations have revealed spatial and temporal evolutions of seismic disturbances in the ionosphere, consistent with previous observations. The ground based ionosonde data has contributed to the study of ionospheric variations at the F-layer peak and also at different heights of the ionosphere. With the help of data onboard the DEMETER satellite in situ measurements of ionospheric electron density, temperature and also electromagnetic field will be done. These data will help in the identification of ionospheric changes due to earthquake generated electromagnetic field. The ground based observations will throw light on the lower ionosphere. With comparison of ground based and satellite recorded data we can understand the generation mechanism of Electromagnetic perturbations registered.

Study of Satellite and ground based observation of ionospheric perturbation associated with earthquakes of M > 6.0.
Study of electromagnetic precursors to earthquakes in the ELF/ULF range using DEMETER satellite data.
Study of short-term ionospheric precursors of earthquakes using Ionosonde data.
Electron and ion density variation associated with strong earthquakes (M>6.0) Using DEMETER satellite data.
Effect of seismic activities on ion temperature in the F2 region of the ionosphere observed by DEMETER satellite.

Statistical study of ionospheric plasma perturbations associated with seismic activity in different regions.

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31. (Presented at 16th National space science symposium 2010 during 24-27 February held at Saurashtra University, Rajkot, 2010).

32. Seasonal Variation of total electron content at crest of equatorial anomaly station during low solar activity conditions.

33. Shivalika Sarkar, Anjana Sonakia, Shweta Mukherjee, and A. K. Gwal.

34. (Presented at 16th National space science symposium-2010 during 24-27 February held at Saurashtra University, Rajkot, 2010).

35. Electron density anomalies associated with earthquakes in Indonesia observed by DEMETER.
**ABSTRACT:** The Indian retail industry is only now beginning to evolve in line with the transformation that has swept other large economies. Fifty years of restricting the consumer goods industry, a national mindset which favored denial over indulgence, and a fractured supply chain for agricultural products have all contributed to prevent the development of modern tenants based on scale advancements and consumer preferences.

**KEYWORDS:** Retail marketing, FMCG companies, market research

**INTRODUCTION:**

The word ‘retail’ means to sell or be sold directly to individuals. Retail is India’s largest industry, and arguably the one with the most impact on the population. It is the country’s largest source of employment after agriculture, has the deepest penetration to rural India, and generates more than 10 percent of India’s GDP. However, retailing in India has so far, been mostly in the hand of small disorganized entrepreneurs. It is also India’s least evolved industries. In fact, it is not even considered a real industry. The industry suffers from lack of management talent, poor access to capital, unfavorable regulation and denial of access to best practices. The Indian retail industry is only now beginning to evolve in line with the transformation that has swept other large economies. Fifty years of restricting the consumer goods industry, a national mindset which favored denial over indulgence, and a fractured supply chain for agricultural products have all contributed to prevent the development of modern tenants based on scale advancements and consumer preferences.

India has some 12 million retail outlets, but many of these act merely as subsistence providers for their owners and survive on a cost structure where labor and land is assumed to be free and taxes nil. Compare this with the global retail industry, which is one of the world’s largest organized employers, is at the cutting edge of technology, and which leverages scale and scope to offer value-added services to its customers.

However, only recently has there been an awakening in this sector, with more organized retailers starting to make an impact. The liberalization of the consumer goods industry, initiated in the mid-80s and accelerated through the 90s has begun to impact the structure and conduct of the retail industry. Backed by changing consumer trends and metrics, liberalization in mindsets driven by media, new Opportunities and increasing wealth, retailing in India, presents a vast opportunity for a variety of businesses - real estate, store design & operations, visual merchandising logistics and communications, B2C service providers, and FMCG companies who can add to their offers by partnering this revolution.

The Indian Retailing Industry stands poised to take off into the 21st century. It is one of the fastest growing sectors in the nation that caters to the world’s second largest consumer market. Retail boom is unabating. India has five million retailers growing at 5 to 7 percent a year. The middle class drives retailing anywhere in the world and this segment should have reasonable income. The next driver is availability of variety of goods, products and brands. The third one is “sense of awareness”.

In other developing economies, this transformation has already begun. In many of these countries, organized retail already has a 40 percent share of the market, compared to India’s current levels of 2 percent.

**2A BRIEF REVIEW OF THE WORK ALREADY DONE IN THE FIELD:**

Whilst retail Globalization practice has a long history, academic research into retail internationalization is a more recent phenomenon. Hollander’s (1970) early work emphasized the effect of political and economic climate on the development of international operations, highlighting the importance of declining domestic opportunities as a factor in retail globalization. Hollander (1970) has been termed as the first important researcher on the subject of Retail internationalization. The largest stream of literature focuses on bilateral flows of investment and concentrates on documenting firms’ moves, stressing the relative advantages which can explain why they enter into a given market thus leading to globalization. Waldman (1978), Treadgold (1988, 1990), Salmon and Tordjman (1989), Burt (1991), and more explicitly Robinson and Clarke-Hill (1990), Pellegrini (1991), Alexander, N (1990, 1993, 1994, 1998), and Whithead (1992) attempted to explain the motivation behind going international and explained the process of globalization.

The drivers inducing the motive of globalization include saturation within home markets compounded by economic downturns, legislation blocking expansion, shareholder pressures for growth, high operating costs, market driven pressures for growth, opportunities as overseas markets open up and even an element of the ‘me-too syndrome’ (Doherty, 1999). In contrast to manufacturers, however, retailers must be physically present wherever they are doing business, and structural and cultural characteristics make it harder to operate across distinctive national markets. Retailers’ performance in local markets is highly sensitive to variations in consumer behavior and segmentation: consumer tastes and buying and spending patterns differ considerably across the international market place therefore hampering global sourcing.

Hallsworth, Alan (2001), identified further topics and issues to be explored such as different modes of entry, international competition and international retail growth. Further research by Treadgold, (1988,1990, 1992), Alexander, (1989, 1990) and Wrigley (1989, 1992) suggest that by identifying a gap in the existing research on retail management, one can measure the factors influencing success and failure of international retailing.

The increased visibility of retail globalization over the past three decades has stimulated a significant volume of academic research. A number of common themes have emerged, as authors have explored the volume and direction of investment (Hollander, 1970; Hamill and Crobie, 1990; Burt, 1991, 1993; Myers and Alexander, 1997; Muniz-Martinez, 1998), the motivations for globalization (Alexander, 1990, 1995; Williams, 1991; Quinn, 1992).
and the role and choice of market entry mechanisms (Quinn, 1998; Doherty, 2000; Gielen and Dekimpe, 2001). Studies of specific retail sectors and geographically determined flows have been accompanied by case studies of “exemplars” of retail expansion (e.g. Treadgold, 1991; Laujaainen, 1991; Wriley, 1997).

Others have developed frameworks categorizing international retailers on the basis of behavioral criteria—most notably business culture and market responsiveness (Treadgold, 1988, 1990; Salmon and Tordjman, 1989; Simpson and Thorpe, 1995; Helfferich et al., 1997; Alexander and Myers, 2000).

Many retailers struggle internationally yet most research explores success (for example the texts and special issues of Akehurst and Alexander 1996; Alexander 1997; Alexander and Doherty 2000; Brown and Burt 1992; Kacker 1985; McGoldrick and Davies 1995; Stemquist 1998; Stemquist and Kacker 1994).

Alexander, A (1999, 2001) and Shaw, G (1999), has significantly contributed on the history of retail globalization. It is evident from these studies that past performance can be a very good source of learning, identifying factors of success, and attributes of failure. Thus preventing further failure and identify success factors for the retail industry in the international market.

The considerable expansion of international activity by retailers since the early 1980s has generated an upsurge of academic study of the process. What has become evident from these studies is that retailer internationalization is a very different process from that undertaken by manufacturers. It has also become evident that the established theoretical frameworks in international business require major modification if they are to be applied in a meaningful way to retailing.

Despite the widespread incidence of failure in retail internationalization, the cynosure of academic study has been success. There has been considerable research on retailers like Marks and Spencer, Boots, Wall-mart, and likes of Next and Laura Ashley, but very few contributions have been made towards the brand management of these retail outlets. Hence there is a visible gap in the academic contributions on this subject.

NOTEWORTHY CONTRIBUTIONS IN THE FIELD OF PROPOSED WORK:

By 2010, the list of India's top 10 retailers will have at least 5 Indian corporate. Retail Marketing will go through a tremendous change in India this millennium. It will change India's cities, its people, and its households. The Indian consumer is reportedly the largest spender in Singapore and London. It is, therefore, strange that there have, so far, been few efforts to present the product in the right kind of environment in India. Indeed, the right shopping experience does induce Indian consumers to spend more. This is evident from the experiences of retail-outlets like Shoppers' Stop, Music World, Food World, Crosswords, The Home Store, Ebony, Bigio’s, Saboos, Standard, Vijaay Store and Janaki Das & Sons, Westside etc.

However, the development of organized retail is dependent on the efforts of several agencies and institutions. The first among these is the government. In a country as big as India and with as many states as ours, it is imperative that the Central government and all state governments bring in Value Added Taxation or a unified taxation system to ensure that the tax-regimes are the same across the country.

The laws governing retail real estate should also be looked into, so that it is possible to develop retail-estate beyond the city-limits.

Apart from providing entertainment and retail opportunities, this will also decongest the city center and facilitate the development of suburbs. The relevant rules should also be amended to allow retail-stores to operate 7 days a week, 12 hours a day. Given the hours most urban consumers keep at work, and keeping in mind the increase in the number of nuclear families, this may, indeed, make sense. This will also help people enjoy their evenings, out at malls.

The second group, whose participation is essential in making retail a boom-sector in this millennium, comprises developers. Most-properties are developed without considering the end user; thus, we sometimes find high-ceilinged offices and low-ceilinged retail store®. Often, the shopper's convenience is not taken into consideration while the property is constructed.

Another area of concern is the way in which developers sell their space. The only consideration is the price, not the usage pattern or the nature of the product that is to be sold. In contrast, internationally, mall-management is treated as a specialized discipline of retail management. This is what we have to focus on in this millennium.

The third constituency that has a role to play in the fortunes of organized retail this century is the education-sector. Retail is a people-intensive business, and there is a huge opportunity for retail institutes in India.

For manufacturers, retailing will present an attractive opportunity. Organized retail allows them to expose their products to a large volume of customers in an environment conducive to buying. Already, several transnational retail giants have established their presence in India; others, notably Chinese retailers, have visited India and studied the Indian market. There is a lot at stake here: even so early in the 21st Century, India is too large a market to be ignored by transnational retail giants.

From the manufacturing company's perspective, the focus should be on producing good products, and forging relationships with organized retail. Manufacturers need to draw a plan of producing quality products and tie in with retailers. Indeed, the birth of organized retail will also engender the creation of private labels and store-brands. Thus, if a manufacturing company lacks the resources to build a brand, it can supply to a retail- chain that has the resources to create a brand of its own.

INDORE MARKET:

Indore is the largest city in the state of Madhya Pradesh. It is situated on the banks of the River Khan and Saraswati. The two rivulets unite at the center of the city where a small temple of Sangannath or Indreshwr exists. The city of Indore derived its name from the deity itself. At an altitude of 553 m above sea level on the Malwa Plateau, this city is nearly the heart of the nation. With growing population, the city is expanding rapidly and so is its tourism industry. Travel to Indore city will present a blissful blend of the past and the future.

Indore is known for its architectural splendor. The tales of the glorious past are narrated by these splendid historical monuments and cast a magical spell on the visitors. Rani Ahiya Bai Holkar was a great architectural patron and spent a lot of money in the construction of temples across the nation. The queen is taken in great regard by the people and as a tribute; her statue was built in the center of the city, near Rajwada. Apart from being a historical city, Indore is also the commercial capital of the state of Madhya Pradesh.
Indore is definitely a place for shopper, there are lots of shopping malls, classic markets, vendors and so on. In Indore largest retail market in rajbada and other major areas of Indore sudama nagar, gumausta nagar, Paiaisia, saket, tilak nagar or vijay nagar- there are many supermarkets that help fulfill the daily needs. Some of them are very cost effective for Money savvy Indore citizens. Indore Supermarkets like Aapurti bazzar, Big Bazaar, Reliance Fresh etc. gives liberty to choose what you want. Their costs are affordable and choices are unlimited. These supermarkets in Indore are great place for day to day shopping with family.

Now Indore represent the upcoming metro cities in India and now the culture and other consumer behavior similar to Metro Cities.

OBJECTIVE OF STUDY:
The purpose of the present study is to accomplish the following objectives:

Proper understanding and analysis of Retail Marketing with effect of globalization

- Conduct a survey in Indore market derives their Functions.
- Effect of Globalization on Retail market in Indore
- To know the strategy of Market, Organization, Financial institutions.
- To analyze a comparative study on the basis Marketing, Organizational, Financial before and after the globalization.

To know the steps of both organizations adopted to make a good financial growth and relationship with its customers before and After Globalization

PROPOSED METHODOLOGY DURING THE TENURE OF THE RESEARCH WORK:
The objective of the study was accomplished by conducting systematic market research. Market research is the systematic design, collecting, and reporting of data and findings that me relevant to different marketing functions facing the company. The marketing research process adopted in the present study consisted of the following stages:

- Objectives* and sources of data: market research requires two kinds of data, primary data and secondary data. Being a firm in the retail sector, data gathering involved the usage of both primary and secondary data though there was an extensive amplification of primary data. Secondary data was collected from various journals, and websites, la our work important thing is to analyze the gathered information form various sources to build by analysis of information we can conclude the strategy and can be prepare the cooperative study before and after of globalization with special reference of Indore.

EXPECTED OUTCOME:
The main aim of research work to analyze the effect of globalization on retail marketing and how the marketing, financial strategy changes after globalization.

Indore is important retail market of Madhya Pradesh and by the complete analysis of Indore market we will conclude the effect of globalization in major cities of India with reference of Retail marketing.

REFERENCE:


Identification of bioactive compounds of nutraceutical and pharmaceutical importance from horticultural plants

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Barkatullah University, Bhopal, MP

Introduction:

In spite of the tremendous advances made in the modern system of medicine there are a large number of diseases for which suitable drugs are still not available. Infection caused by parasitic agents and/or physiological disorders are the main reasons of human health problems. In the course of man’s endeavor through ages to find means to protect himself from infection or correct the defective bio-chemical processes man has developed several systems of medicine like Ayurvedic, Unani, Sidda, Homeopathy, etc. where most of the formulations have their origin from the vast plant resources. Though these formulations and medicines have been successful in giving a substantial level of protection to man the pathogenic microbes have competed well to them and or evolved mechanisms for their own survival in presence of large number of drugs.

The realization that many infectious pathogenic organisms are fast developing resistance against prevailing drugs has necessitated a search for new sources of antimicrobial compounds.

Plants have been a major natural reservoir of therapeutic agents for the alleviation or cure of human diseases since time immemorial. Unlike animals, plants do not have similar immune system to safe-guard themselves from the attack or infection from other organisms, but they do adopt some physical and chemical methods to protect themselves from biotic stresses. Plants produce some chemical substances which act as deterrents and also as lethal weapon to many infectious agents thus providing them protection.

Horticultural plants/products which include fruits, flowers, spices & condiments, etc. constitute the bulk of our daily dietary intake. They can therefore be considered to be safe. Several of the horticultural plants are also known to have antimicrobial properties but hardly any systematic work has been done to isolate the bio-active compounds from horticultural sources particularly the huge amount of wastes like seed, rind, seed coat, pericarp, etc. of several plants. In this proposed study emphasis will be given to detect antimicrobial activity from horticultural waste materials.

There are about 125 clinically useful prescription drugs of known structure that are derived from about 100 species of higher plants. Plants derived medicines are proving to be highly effective in the treatment of diseases including cancer, cardiovascular disorders, hypertension, dementia, etc. They are often preferred over their synthetic counterpart for the latter’s relatively high side effects and escalating prices.

Bio-prospecting of plant species is in progress in many laboratories for the discovery of new pharmaceuticals for health problems such as drug resistant infectious diseases, diabetes, asthma, arthritis, neurological (ALS/MND) and psychiatric disorders.

Therefore this study has envisaged to fulfill the following objectives:

Objectives:
1) Collection of plant materials, preparation of alcoholic and aqueous extracts.
2) Bio-evaluation of the extracts for their antibacterial and antifungal activities.
3) Evaluation of the extracts for other values e.g. antioxidant, bio-enhancing property etc.
4) Fractionation of the active plant extracts.
5) Detailed study on mode of action using in vitro model involving plant test, microbial mutants and cloned genes.

Literature Review:
Higher plants are sources of phytochemicals, which are useful as therapeutic agents. Anti-cancerous agents such as taxol, vincristine, vinblastin are the best examples of plant derived drugs. Chloroquine and artemisinin isolated from cinchona bark and Artemisia annua respectively are another example of potent anti-malarial compound in clinical use.

Plants are also considered to be rich sources of antimicrobial substances since plant have co-evolved with microbes either in a symbiotic or as pathogenic interaction, they have evolved mechanisms to produce chemical substances which either help in their association with microbes or prevent the establishment of pathogenic state by killing them. Some of the plant species which are known to synthesized antimicrobial substances, have been listed in the following table(I).
transposon mutagenesis: 

This will be carried out by introducing the Tn:5 carrying suicidal vector into the log-phase bacterial culture with nitroso-guanidine (NTG) at the rate of 100 pg/ml followed by incubation for 1.5-2 generation time and then washing the cells free of mutagen by centrifugation. This will be followed by incubating the cells in fresh growth medium for fixation of the mutational lesions for 5 to 6 generations. This mutagenised culture will then be utilized for selection of mutant specific phenotype.

Transfer of cloned genes:

For carrying out experiment for genetic complementation as well as transgene expression in mutant and wild type host cell, the mobilization of cloned genes on plasmid vector will be done either by conjugational mating or through direct transduction by bacteriophage adsorption. After an incubation of about 1 generation time the conditions favoring elimination of the vector and selection of Kanamycin resistant colonies which are likely to have Tn:5 insertion then be screened for the desired mutant phenotype.

Expected outcome of the proposed work:

Some active phytochemicals are likely to be identified which upon follow up by in vivo testing and

### Table 1.

<table>
<thead>
<tr>
<th>Serial no.</th>
<th>Name of plant</th>
<th>Type of activity</th>
<th>Reference number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Aegle marmelos</td>
<td>AB, AF</td>
<td>29</td>
</tr>
<tr>
<td>2</td>
<td>Mangifera indica</td>
<td>AM</td>
<td>07</td>
</tr>
<tr>
<td>3</td>
<td>Anacardium occidentale</td>
<td>AM, AF</td>
<td>20</td>
</tr>
<tr>
<td>4</td>
<td>Momordica charantia</td>
<td>AB</td>
<td>17</td>
</tr>
<tr>
<td>5</td>
<td>Citrus grandis</td>
<td>AB</td>
<td>25</td>
</tr>
<tr>
<td>6</td>
<td>Coriandrum sativum</td>
<td>AB</td>
<td>10</td>
</tr>
<tr>
<td>7</td>
<td>Zinziber officinale</td>
<td>AB</td>
<td>21</td>
</tr>
<tr>
<td>8</td>
<td>Allium sativum</td>
<td>AB, AF</td>
<td>27,02</td>
</tr>
<tr>
<td>9</td>
<td>Raphanus sativus</td>
<td>AB</td>
<td>02</td>
</tr>
<tr>
<td>10</td>
<td>Capsicum frutescens</td>
<td>AB</td>
<td>02</td>
</tr>
<tr>
<td>11</td>
<td>Phoenix dactylifera</td>
<td>AB, AF</td>
<td>04,22</td>
</tr>
<tr>
<td>12</td>
<td>Carica papaya</td>
<td>AB, AF</td>
<td>30</td>
</tr>
<tr>
<td>13</td>
<td>Citrus aurantifolia</td>
<td>AB</td>
<td>08</td>
</tr>
<tr>
<td>14</td>
<td>Psidium guajava</td>
<td>AB</td>
<td>13</td>
</tr>
<tr>
<td>15</td>
<td>Annona reticulata</td>
<td>AB, AF</td>
<td>23</td>
</tr>
<tr>
<td>16</td>
<td>Nigella sativa</td>
<td>AB, AF</td>
<td>14</td>
</tr>
<tr>
<td>17</td>
<td>Cinnamomum zeylenicum</td>
<td>AB</td>
<td>16</td>
</tr>
<tr>
<td>18</td>
<td>Persea americana(Avocado)</td>
<td>AP</td>
<td>03</td>
</tr>
<tr>
<td>19</td>
<td>Moringa olitora</td>
<td>AB</td>
<td>09</td>
</tr>
<tr>
<td>20</td>
<td>Tamarindus indica</td>
<td>AB, AF</td>
<td>15</td>
</tr>
<tr>
<td>21</td>
<td>Curcuma longa</td>
<td>AB, AF</td>
<td>28</td>
</tr>
<tr>
<td>22</td>
<td>Acacia nilotica</td>
<td>AF</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Potato</td>
<td>AB</td>
<td>32</td>
</tr>
<tr>
<td>24</td>
<td>Cucumis sativa (Cucumber)</td>
<td>AB</td>
<td>11</td>
</tr>
<tr>
<td>25</td>
<td>Glycyrrhiza glabra</td>
<td>AB, AF</td>
<td>24</td>
</tr>
<tr>
<td>26</td>
<td>Glycyrrhiza inflata</td>
<td>AB, AF</td>
<td>24</td>
</tr>
<tr>
<td>27</td>
<td>Spinich</td>
<td>AB, AF</td>
<td>28</td>
</tr>
</tbody>
</table>

AB= antibacterial, AF= antifungal

Note worthy contribution already made in this field:

At Central Institute of Medicinal and Aromatic Plants(CIMAP), Lucknow a full program on bio-prospecting novel bio-active molecules is in progress and recently two patents have been filed at national and international level related to detection of novel activities and development of the unique bio-sensor system.

Methodology:

1. Preparation of plant extracts from collected plant materials:
   Various plant parts will be collected and dried and then both ethanolic as well as aqueous extract will be prepared.

2. Anti-microbial activity testing:
   The antibacterial activity present in plant extracts will be identified by Disc Diffusion Assay (Bauer et al., 1966), Broth Dilution method (Petersdorf & Sherris, 1965) and by plate dilution method. The antifungal activity will be carried out at two levels. As a preliminary test, the antifungal property in the plant extracts will be estimated by agar diffusion method (Wannissom et al. 1996) Samples showing positive results in the preliminary test will be used for the determination of Minimal Inhibitory Concentration (MIC).

3. Isolation/identification of bio-active molecules:
   Activity guided fractionation and isolation of potential antibacterial and anti-fungal agents will be done depending upon the sensitivity, percentage composition, nature and polarity of the active compounds their isolation will be achieved with the application of modern separation techniques. The biologically active plant extracts will then be put to modem molecular structure elucidation techniques to identify the compound(s).

Chemical mutagenesis will be carried out by treating the log-phase bacterial culture with nitroso-guanidine (NTG) at the rate of 100 pg/ml followed by incubation for 1.5-2 generation time and then washing the cells free of mutagen by centrifugation. This will be followed by incubating the cells in fresh growth medium for fixation of the mutational lesions for 5 to 6 generations. This mutagenised culture will then be utilized for selection of mutant specific phenotype.
chemical trial might be developed into drugs and nutraceutical.

List of published papers of the candidate:

- Antibacterial activity of the leaf and floral tissues as a marker for selecting genotype with high essential oil in *Artemisia annua* and *Mentha arvensis*; SPS Khanuja, Dharmendra Saikia, Sunita Dhawan, Dipali Gupta, AK Singh, AA Naqvi and Sushil Kumar; 38th Annual AMI Meeting and Conference on microbes in substantial development; New Delhi; Dec 12-14; 1997.

- Antibacterial activity of a wild grass *Cyperus scariosus*; Dharmendra Saikia, VK Gupta and RK Singh; National Conference on Plant Biotechnology: Towards strategic agriculture and drug development; Lucknow; March 15-17; 1999.

- Evaluation of the antimutagenic activity of some medicinal plants extracts against direct acting mutagens; FM Khan, RK Singh and Dharmendra Saikia; National Conference on Plant Biotechnology: Towards strategic agriculture and drug development; Lucknow; March 15-17; 1999.

- Comparative bio-evaluation of essential oils of three species of *Cymbopogon* for their antimicrobial activities; Dharmendra Saikia, TR Santha Kumar, AP Kahol and SPS Khanuja; National Seminar on the Research and development in Aromatic plants; Lucknow; July 30-31; 1999.

- Assessment of diversity among *Taxus wallichiana* accessions from North-East India using RAPD analysis. Dharmendra saikia, SPS Khanuja, AK Shasany, MP Darokar, AK Kukreja and Sushil Kumar (communicated to Plant Genetic Resources News Letter, Rome, Italy).

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Hand Gesture Recognition Based 3D CAPTCHA

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ABSTRACT—CAPTCHA stands for Computer Automated Public Turing Test to tell Computers and Humans Apart which is a widely used security technique to avoid spams and automatic form submissions by bots, thus ensuring that the end user is a human. An alternative to the present Text Based CAPTCHA is a system based on Hand Gesture Recognition and Pattern Matching is proposed in this paper. This approach will verify user as human and prevent bots from spamming applications and services thus making the entire process more secure and reliable. This technique will generate a random series of number which the user will be prompted to mimic as gestures with their hands and it will be captured by the Computer Webcam or mobile phone. A pattern matching algorithm based on SIFT algorithm will run on the user provided images to identify maximum keypoints after comparing from the database of the pre-stored standard gesture images and after finding a successful match, the site will be navigated to the next page. This process is highly efficient as it is very difficult to design a bot to identify gestures in images.

Key words: Hand detection, hand posture recognition, feature extraction, SIFT, CAPTCHA

1. Introduction

CAPTCHA (Completely Automated Turing test to tell Computers and Humans Apart) is widely used security mechanism on the web to ensure that response is from a person and not a bot. Hand Gestures provide a natural and intuitive communication modality for human–computer interaction. Efficient human computer interfaces (HCl’s) have to be developed to allow computers to visually recognize in real time hand gestures. An image of misrepresented letters is dynamically generated. The letters are part of image not a plain text CAPTCHA which uses a type of challenge response test to determine that the response is not generated by the computer. Now a day’s all sorts of websites are using small to large CAPTCHA’s [1].

Commonly used CAPTCHA consists text based challenge is given to web clients to be typed in textbox where humans can pass the challenge but not the machine. For example a human can easily read misrepresented text shown in figure 1 but current programs cannot. CAPTCHA is mainly used to avoid spam. Spamming is performed on various public email provider sites and also on various forums and blogs. This comes into picture where users need to submit some content to a service or web applications. Even though many types of CAPTCHA are implemented they fail at some time, for e.g., background CAPTCHA are easily hacked by using simple computer vision techniques [1]. CAPTCHA should be in such a way that it should be easily understandable by humans and should be easy to answer or interact with the process, it should be very hard for bots or machines to solve or it should be only understandable by humans, while bots cannot understand the process. And also there should be an easy process to generate and evaluate CAPTCHA and should not produce network overheads. Designing a CAPTCHA which satisfy these requirements is not so easy and that’s the reason some times CAPTCHA [1] fail. Keeping in mind these systematic rules, our system performs 90% accurate process of identifying human. We generate simple clear images of characters that are not blended or twisted so it is easily understandable by humans. Now we provide a new way of user interaction with CAPTCHA process, that is acquiring answer via image of user gesture either using webcam or mobile phone camera. Using this way bots cannot submit image, only user can submit gesture image [8, 9, 10]. We perform a pattern matching algorithm and verify if user submitted image is a gesture of particular character [5, 6]. Our system is highly intuitive and easily understandable by humans and user feel it more appealing than annoying traditional image based CAPTCHA [1]. However, vision-based hand tracking and gesture recognition is a challenging problem due to the complexity of hand gestures, which are rich in diversities due to high degree of freedom (DOF) involved by the human hand. In order to successfully fulfill their role, the hand gesture HCI’s haveto meet the requirements in terms of real-time performance, recognition accuracy, and robustness against transformations and cluttered background.

2. Working of CAPTCHA

Many types of CAPTCHA are developed and implemented to prove particular subject is human or any kind of programmed bot. There have been various attempts at creating more accessible CAPTCHAs, including the use of JavaScript, mathematical questions the most widely used CAPTCHAs are the so-called text-based schemes, which rely on sophisticated distortion of text images aimed at rendering them recognizable to the state of the art of pattern recognition programs [5]. The popularity of such schemes is due to the fact that they have many advantages, for example, being intuitive to users world-wide (the user task performed being just character recognition), having little
localization issues (people in different countries all recognize Roman characters), and of good potential to provide strong security (e.g. the space a brute force attack has to search can be huge, if the scheme is properly designed). Internet spam is defined as "unsolicited commercial bulk e-mail", or junk mail, in other words advertisements that marketers blindly send to as many addresses as possible. It is widely accepted that the spam problem and the so called "Bots" have become a nuisance and must be defended against. Whereas individual anti-spam preventive measures and email address filtering may be used as a short term solution, there is a need for more comprehensive solutions such as HIPs and CAPTCHAs.

3. Proposed System

In our system we generate random numerical character set and ask user to show gesture corresponding to certain numeral. User gesture is captured and processed to identify if it represents shown number, if gesture is correct CAPTCHA is solved and user is treated a human[1]. Figure 4 shows complete system setup. A random series of numbers of 4 character length is generated and numbers are represented by C1, C2, C3, C4 user gesture images are captured as I1, I2, I3, I4 corresponding to C1,C2,C3,C4. We apply Robust Scale-invariant feature transform (SIFT) algorithm to find key-points of input images against database images. Now we find matching by calculating distance between database test image and input image and find Validity ratio or percentages of matching and find if two or more matches exist then we make slight variations to parameters like threshold and perform key-point calculation, matching and percentage calculation to find exact match and identify gesture.

4. Hand Tracking and extraction Technique

Here, we develop a real-time hand tracking method which is robust and reliable in complex background. To track the moving hand and then extract the hand shape fast and accurately, we need to consider the trade-off between the computation complexity and robustness.

Detecting and tracking hand gestures in a sequence of images help in extracting hand region. Thus, processing time will be reduced and accuracy will be increased as the features of that region will represent the hand gesture only. Skin color [39]–[41] is a significant image feature to detect and track human hands. However, color-based methods face the challenge of removing other objects with similar color such as face and human arm. To solve this problem, we proposed a new technique to detect hand gestures only using face subtraction, skin detection, and hand posture contour comparison algorithm. We used the Viola–Jones method [11] to detect face, and this method is considered the fastest and most accurate learning-based method. The detected face will be subtracted by replacing face area with a black circle. After subtracting the face, we detected the skin area using the hue, saturation, value (HSV) color model since it has real-time performance, and it is robust against rotations, scaling, and lighting conditions. Then, the contours of skin area were compared with all the loaded hand gesture contours to get rid of other skin-like objects existing in the image. The hand gesture area only was saved in a small image, which will be used in extracting the keypoints by scale invariant feature transform (SIFT) algorithm.

4.1 Finding key-points using SIFT

Algorithm: Scale-invariant feature transform is an algorithm in computer vision to detect and describe local features in images. The algorithm was published by David Lowe in 1999.

It is developed as a method to extract and describe key-points, which are robust to scale, rotation and change in illumination. There are five steps to implement the SIFT algorithm:

1) Scale-space extrema detection: The first stage searches over scale space using a Difference of Gaussian (DoG) function to identify potential interest points that are invariant to scale and orientation.

2) Key-point localization: The location and the scale of each candidate point are determined and the keypoints are selected based on measures of stability.

3) Orientation assignment: One or more orientations are assigned to each key-point location based on local image gradient directions.

4) Key-point descriptor: A feature descriptor is created by computing the gradient magnitude and orientation at each image sample point in a region around the key-point location. These samples are then accumulated into orientation histograms summarizing the contents over 44 regions with 8 orientation bins. So each key-point has a 128-element feature.

5) The correspondence of feature points can be determined by taking the ratio of distance for the descriptor vector from the closest neighbor to the distance of the second closest.

Using this algorithm we read image and calculate key-points, descriptors and locations by applying threshold. The extracted key points are invariant to scale, orientation and partially invariant to illumination changes, and are highly distinctive of the image. Therefore, the SIFT is adopted in this paper for the bare hand gesture recognition.

5. Finding images similarity using a distance calculation algorithm.

After identifying key-points using SIFT, calculate the distances of the matched key-points to the center of key-points and construct a distance ratio array by summing distances of input image and test image. Now we verify if absolute of differences in distances sum of both images is below threshold value, and collect those points as they are valid matched key-points. If we have more than one match here we can decrease threshold and identify exactly a particular match [5]. We calculate validity ratio as by dividing number of valid key-points by number of matched key points: \( \text{Ratio} = \frac{d_{11} + d_{12} + d_{21} + d_{22}}{d_{11} + d_{12} + d_{21} + d_{22}} \) -- (3)
Distance = \text{absolute } \{\text{Ratio}_1 - \text{Ratio}_2 < \text{MatchingThreshold}\} \quad -- (5)

ValidPoints = \text{sum(distance)} \quad -- (6)

5.1 Hand Gesture processing

In this step we employ the SIFT Algorithm. SIFT finds the key-points from the input and compares with the gestures set in matched case proceeds further if not takes input repeatedly till gesture is satisfy.
Hand Shadow detection using OpenCV libraries

6. User Experience and Results
When presented this system to user, we got a huge response for its simplicity and intuitive ness; user is able to show gesture, correctly and is able to put 4 gestures correctly out of 6 gestures [6, 8, 10]. This system is quite easy for the user.

Through our hand gesture recognition based CAPTCHA system we found 96% and above success rate when evaluating this system and able to find percentage of identifying a gesture that represent a character is 73%.

7. CONCLUSION AND FUTURE WORK
We proposed and implemented a Hand Gesture Based CAPTCHA system works efficiently. It is secure and very hard to crack, the experimental result shows that our system will work better input image has good resolution. This can be extended to a client server based model where CAPTCHA processing server is setup with an API to embed generated CAPTCHA on various websites and perform CAPTCHA human or bot verification.

References