

## **FORECASTING HIGH FREQUENCY FINANCIAL DATA: MODEL IDENTIFICATION**

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### **ABSTRACT**

With the advent of technology in trading, High Frequency Financial Data (HFFD) which have different features compared to low frequency data require new modelling techniques. A variety of Autoregressive Conditional Duration (ACD) models including the threshold ACD models have proven to be efficient in representing the dynamics of trade duration processes. So far, the threshold ACD model has been formulated with the standard ACD and the generalised gamma distribution. This paper extends the 3-regime framework to other ACD specifications combined with different conditional distributions. The forecasting power of the threshold models are compared to the standard ACD model with the same error distributions. Results show that the standard ACD model with the generalised gamma and Generalised-F distributions produces the best estimates. On the other hand, for the threshold models, the best estimates are obtained for the fast and normal regimes. The slow regime contains a higher amount of duration clustering which most models are unable to capture. For the 3-regime method, specifications such as the Box-Cox ACD (BACD) and Augmented Box-Cox ACD (ABACD) work best with the exponential distribution for the first regime and the generalized gamma and q-Weibull distributions for the second and third regimes.

**Keywords:** *High Frequency Financial Data, Autoregressive Conditional Duration, 3-regime model, forecasting, error distributions.*

## **A STUDY ON CURRENT LEVELS OF COMMUNITY ENGAGEMENT IN HIGHER EDUCATIONAL INSTITUTIONS – STUDENTS’ PERSPECTIVES**

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### **ABSTRACT**

This paper attempts to explore the current levels of community engagement practices, factors that influence the current levels of community engagement and social responsibility activities, the present best practices and limitations in HEIs from the perspectives of students. Primary data has been collected from 711 students by purposive and cross-sectional sampling method. The data collected has been analyzed by using descriptive statistics, factor analysis and Word clouds in R. Results reveal that Learning subjects through experiential teaching methods, not-for-credit activities and students’ initiatives and innovations are the top three engagement practices. Present best practices identified indicate that community engagement and social responsibility is not-for-credit and volunteering based represented by various forums like NSS, NCC and Rotract etc. Lack of management support, hectic academic schedule and attitude of students are indicated as top most limitations expressed by students. Institutional System and Support, Teaching and Learning, Avenues and Contribution and Support factors and identified as factors influencing the current levels of community engagement and social responsibility practices.

**Keywords:** *Community Engagement, Social Responsibility, Students, Community Engagement Practices, Factors influencing present levels of community engagement, Best Practices and Limitations.*

## **APPLICATION OF FUZZY PARADIGM IN SUPPLY CHAIN MODEL**

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### **ABSTRACT**

In supply chain model, computation of performance measures is always intended to be close to reality. Environment of uncertainty shrouding supply chain, enormously affects its performance measures. In this paper, an important kind of uncertainty as fuzziness has been subject of investigation. Using fuzzy paradigm, optimal performance measures of the supply chain model have been computed. Sensitivity analysis as well as discussion of correlation between the total optimal cost and other parameters involved therein has been exhibited to gain the further insight into the model.

## **A GENERALIZED RATIO TYPE ESTIMATOR FOR ESTIMATING FINITE POPULATION MEAN USING MEDIAN OF THE STUDY VARIABLE UNDER PREDICTIVE MODELING APPROACH**

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### **ABSTRACT**

In this study, we develop an improved estimation procedure for the population mean utilizing information of median of study variable under the predictive modeling approach. The expressions for the asymptotic properties of an estimator like bias and mean squared error (MSE) were computed, and efficiency comparison of the proposed estimator was conducted with other competing estimators. Also, an empirical study was carried out to verify theoretical findings.

**Key words:** Bias, Prediction, MSE, Efficiency, Median

## **RELIABILITY PREDICTION OF K-OUT OF N:G SYSTEM WITH IMPERFECT FAULT COVERAGE WITH REBOOT AND SWITCHING FAILURE**

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### **ABSTRACT**

This article investigate the steady-state availability and the reliability measures of the hardware and software components with warm standby, reboot, switching failure and imperfect coverage. The coverage factor is taken into account for an operative-unit failure as that for a warm standby-unit failure. The failure times of the operative unit and warm standby unit are exponentially distributed while the repair time is arbitrary distribution. Using Runge-Kutta techniques, various performance measures of system such that reliability, expected numbers of repairs, MTTF, MTBF etc. have to obtained, to make the analysis more informative. The trend of the system indices have been studied graphically explore the sensitivity of system descriptors.

**Keywords:** *Hardware and software system, Markovian model, Repair, Warm standby, Coverage, Rebooting, Switching failures, Reliability, Availability.*

## **ANALYSIS OF AN M/G/1 RETRIAL QUEUE WITH MULTI OPTIONAL SERVICE AND FEEDBACK UNDER MIN (N,V) VACATION SCHEDULE**

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### **ABSTRACT**

This paper discusses an M/G/1 retrial queue with Bernoulli feedback where the server takes vacation as per the Min(N,V) policy. The server offers multi optional service with the possible options  $i=1,2,\dots,m$ . Arrivals to the  $i^{\text{th}}$  optional service occur according to a Poisson process with rate  $\lambda_i$  and the service times of the customers in the  $i^{\text{th}}$  options are independent and identically distributed random variables with general distribution function  $S_i(x)$ ,  $i=1,2,\dots,m$ .

The customers in the orbit access the server under FCFS discipline and the retrial time follows an arbitrary distribution. Further, it is assumed that there is a possibility of server failure while commencing the service. The server goes on a vacation when there are no customers waiting in the orbit as per the Min (N,V) vacation policy. At the end of a vacation period, if the orbit is empty the server begins another vacation. Otherwise, the server stays in the service area waiting to serve the customer from them orbit. During the vacation period if the number of customers in the orbit reaches N, the server interrupts his vacation immediately and returns to idle state to start servicing. The steady state distribution of the system size is analysed using the supplementary variable technique. We also obtain certain performance measures such as the mean system size, probability that the system is empty. The general decomposition law for the system size is established for our model. Exhaustive numerical analysis is performed and the results are presented in the form of graphs. Finally, some of the existing results are deduced as particular cases of our model.

**Keywords:** *Retrial; Min (N,V) policy; Customer feedback; Starting failure; Stochastic decomposition;*

## **ARTIFICIAL NEURAL NETWORKS (ANNS): AN EFFECTIVE TOOL IN FINANCIAL ANALYSIS**

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### **ABSTRACT**

Artificial Neural Networks (ANNs) have emerged as a powerful technique of forecasting and prediction in almost every part of the business. Due to its distinct ability of detecting the underlying relationship between the different sets of data, its usage has gained a vital importance. This study emphasizes on two basic objectives i.e. (i) Explore the development of ANNs over a period of time (ii) Importance and scope of ANNs in finance. However various academicians and prominent scholars have presented their views on the scope and importance of ANNs in finance. So, the idea behind this research is to provide an extensive & exhaustive literature review on the development, scope & importance of ANNs in Accounting and Finance. Several factors impact the accuracy of ANNs that includes choice of input variables, architecture selected for the given problem, training of ANNs etc. Thus, it becomes significant to study these factors before building an Artificial Neural Network. Various Studies conclude that ANNs provide a better statistical technique in forecasting when compared with other conventional prediction models. They are being widely used by professionals of various industries to predict the stock prices, evaluation of loans, finding the most appropriate customers for credit card business and many more. However, some studies also reveal that traditional statistical tools have outperformed ANNs in forecasting. So, it becomes significantly important to identify the key areas where ANNs have shown good potential.

**Keywords:** *Neural Networks(NNs), Artificial Neural Networks, Financial Modelling, Data Analytics.*

## **SOCIAL MEDIA ADDICTION AND CHANGES IN PHYSIOLOGICAL, EMOTIONAL AND BEHAVIORAL PATTERN OF YOUTH: AN SEM APPROACH**

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### **ABSTRACT**

Nowadays, social media addiction is getting prominent among the youth that is hindering the social and economic growth and development of youth. This paper attempts to highlight the serious concern of social media addiction by capturing the impact of this addiction among youth on their physiological, emotional and behavioral patterns. Structural equation modeling has been applied to investigate the impact of social media addiction on youth at University level. The results indicated a significant impact of social media addiction on the changes in the physiological, emotional and behavioral patterns of youth which has posed an alarming situation for the society as well as for the economy. The findings and implications of this paper can be utilized by the academicians, researchers, social activists, organizations and industry experts to fill the academic gap as well as for the betterment of the society by giving rational directions to the youth.

**Keywords:** *social media addiction, physiological pattern, emotional pattern, behavioral pattern, structural equation modeling*



## **NEXUS BETWEEN SERVICES SECTOR GROWTH AND ECONOMIC GROWTH IN THE ASEAN**

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### **ABSTRACT**

**Purpose-** The emergence of the services sector as the most dynamic sector in the world economy is unquestionable. This sector is a sizeable and continuously expanding sector of gross domestic product in the ASEAN countries. The services sector is the primary contributor to ASEAN Member States' Gross Domestic Product (GDP). The study examines the effect of services sector growth on the economic growth of the ASEAN economies.

**Design/ Methodology-** Yearly data of services sector contribution to GDP (in US dollars) comprising of Wholesale, retail trade, restaurants and hotels, transport, storage and communication, and other activities from 1970 to 2017 for all the ASEAN countries have been considered. The growth of services sector contribution to GDP measures services sector growth. Economic growth is captured by Gross domestic product per capita (GDPpc) in US dollars for all the ASEAN countries. The data have been taken from the United Nations database. The panel data for the ASEAN countries have been checked for stationarity, cointegration, causality, and cross-section dependence. The study employed various test like panel cointegration and pooled mean group ARDL methods to test the short and long-run causal relationship.

**Findings-** The results of the panel cointegration (long-run) tests and pooled mean group ARDL model supports both short and long-run association amongst services sector growth and economic growth of the ASEAN economies. This cross country analysis also provides valuable insights into the contribution of services sector growth to per capita economic growth of each of the ASEAN countries.

**Research Implications-** The results support the fact that services sector growth in ASEAN and in the developing world should be given more significant support in terms of investment in infrastructure. One such driver of growth has been the growing financial services sector, which has shown a tremendous performance through an increase in the utilization of banking services, fintech, and continues ASEAN integration. Regional integration has increased over the years through trade in goods and services in order to achieve the vision of the unified, seamless ASEAN Economic Community (AEC) in the future. The study is significant in the context of that growth of this sector also attributes towards the attraction of FDI in this sector. The spillover effect which this sector creates on manufacturing and agricultural sector could also be of significant importance.

**Originality-** The study makes a unique attempt to measure the nexus between services sector growth and economic growth of the ASEAN. This cross country analysis also provides valuable insights into the contribution of services sector growth to per capita economic growth of each of the ASEAN countries.

## **DO GLOBAL FOOD PRICE INFLATION HAVE MEMORY: AN EMPIRICAL STUDY USING FOOD PRICE INDICES**

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### **ABSTRACT**

**Purpose-** The study explores whether global food prices inflation shows signs of persistence or memory. Presence of memory would indicate that inflation is predictable. We look for evidence of long memory in global food price inflation (FPI) and its sub-indices like meat prices inflation (MPI), dairy prices inflation (DPI), cereal prices inflation (CPI), oil prices inflation (OPI) and sugar prices inflation (SPI).

**Design/Methodology-** The study employs both classical and modified rescaled-range (R/S) analysis and supplements the findings by studying whether the series is fractionally integrated using Geweke and Porter-Hudack (1983) (GPH), and modified GPH statistic of Robinson's estimate (1995). The study is conducted for the period from January 1990 to March 2019. Then we apply the ARFIMA model for prediction.

**Findings-** The findings indicate that food prices inflation reveals long memory properties and shows persistence behavior. It is observed that food prices inflation is persistent along with three of its sub-indices, which are dairy, cereal, and oil. These three sub-indices and its proportionate contribution to the food price index calculation based upon their export carries immense importance. A short memory is, however, observed in the case of meat and sugar prices index.

**Research Limitations/Implications-** The results reveal that shocks to the food prices may not subside quickly and thus should require strong policy measures to return the series to their equilibrium levels in the event of adverse shocks. The results have important implications for food policy, international trade policy, regulatory bodies, and decision makers.

**Originality-** Although country-specific study relating to global food price inflation exists but global food price inflation, and its sub-level analysis is scarce, and there lies the uniqueness of the study.

## **HYBRIDIZATION OF IoT NETWORKS WITH INTELLIGENT GATEWAYS**

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### **ABSTRACT**

Internet of Things (IoT) has evolved as a powerful technique over the past few decades. It empowers physical world devices with intelligence and enables communication and remote control via internet. The technique is however challenged with limited bandwidth and power. For communication, IoT devices mainly depend upon wireless communication that offers a limited and already crowded bandwidth. Moreover, battery operated sensor nodes impose a critical issue of power constraint. Hybridization (integration of wired and wireless protocols) of front-end data collecting part of IoT networks has been investigated with intelligent gateways. An intelligent gateway has been proposed with user task classification and scheduling abilities. Depending upon the task requirements in terms of time and reliability sensitivity, the gateway selects the link (wired or wireless) for task execution. kNN (k-Nearest Neighbors), a supervised machine learning algorithm has been used for task classification and decision making (to select a particular link). Reliability analysis of the proposed hybridized network has been done in terms of successful transmission percentage. The results validate the proposed technique for resource constrained IoT networks.

## **A HYBRID MODEL ON ANFIS AND WAVELET WITH FEATURE EXTRACTION AND FEATURE SELECTION FOR FOREIGN EXCHANGE RATE PREDICTION**

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### **ABSTRACT**

To make the strategy and planning of any foreign trading, the foreign exchange rate prediction is required which play an important role for financial experts. In this paper rather than using single technique, hybrid of intelligent techniques are purposed to enhance the ability for accurate prediction of future value of foreign exchange data. This paper suggests hybridization of four techniques: Adaptive Neuro-Fuzzy Inference System (ANFIS), Wavelet, feature extraction and feature selection. ANFIS is applied for prediction of non-linear Foreign Exchange (FX) data, wavelet is used as pre-process of data by removing noise from it, feature extraction for generating new feature space from original feature space and feature selection is used for selection best features among several features to improve the accuracy of predictive model. In this paper five new features: Simple Moving Average (SMA), Exponential Moving Average, Weighted Moving Average (WMA), Variance and Standard Deviation are extracted and among them SMA, WMA and VAR are provides best predictive result with MAPE=1.246, MAE= 0.011 and RMSE= 0.013.

**Keywords:** *ANFIS (Adaptive Neuro-Fuzzy Inference System), Wavelet, Feature selection, Feature extraction.*

## **AN OVERVIEW OF EMOTIONAL INTELLIGENCE ON WORK PLACE WITH REFERENCE TO SERVICE SECTOR OF INDIA**

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### **ABSTRACT**

Intelligence is considered as one of the most desirable personality qualities in today's society. I.Q. tests are presently employed for many purposes such as selection, diagnosis and evaluation in all parts of society. It claims that, "it is the single most effective predictor of individual performance at school and on the job. Some critics of I.Q. believe that intelligence is more of a result of an individual's opportunities to learn skills and information in a particular situation. Successful learning in school depends on many personal characteristics such as persistence, interest in school, and willingness to study. Encouragement for academic achievement received from friends, family and teachers is also important, together with other cultural factors.

**Key Words:** *Emotional Intelligenc.*

## **PSYCHOLOGICAL EFFECTS OF INVESTOR PERCEPTIONS ON THE INVESTING DECISIONS: A CASE OF GOA**

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### **ABSTRACT**

The world today has become very complex in various facets and with the growing complexities, the financial sector is gradually growing complex in terms of various instruments and avenues to park money for growth. Words like Investments, Returns, etc have become a buzz word in the circuits of educated mass in the country as the population has clearly understood the value of existence of money for leading a smooth and comfortable life. People from various social status group and professions have now realized the importance of saving the money for future and not only the savings, but to invest it for letting it grow over a long term time period for adequate returns. In this light, an attempt has been made to study the behavioural dynamics of an investor and the dynamics of his Perception, Attitude and Psychology in deciding the right avenue to invest his hard earned money and to find out what are the factors primarily govern such an investor to take an investment decisions.

**Keywords:** *Investment, Mutual Funds, Hedging, Investor Psychology, Behavioural Finance.*

## **LENGTH AND BREADTH OF CONTENT MARKETING WITH RESPECT TO SOCIAL MEDIA: A REVIEW**

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### **ABSTRACT**

The marketing environment is changing drastically, as a consequence companies are competing innovative ways to create connect. Social media provides great platform to the companies to distribute their messages widely through great content. Social media acts as a promotional tool whereas content helps in creating lifetime engagement with the customer. The present study explores the scope of content marketing in the context of social media. It presents a comprehensive review of content marketing with respect to the most emerging and significant areas. A great number of research papers spanning more than a decade on content marketing have been examined from popular databases such as EBSCO and ProQuest have been thoroughly researched. Finally, the review work has been further segregated by authors to suggest avenues for potential research in content marketing.

**Keywords-** *Social Media, Content, Customer engagement, Branding.*

## **SYSTEM DYNAMIC MODELING FOR QUALITY ASSESSMENT IN HIGHER TECHNICAL EDUCATION**

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### **ABSTRACT**

In this study an attempt has been made to study the effect of various important parameters concerned with faculty, students, and infrastructure, of the technical institute offering graduate and post graduate programs in engineering. System dynamics has been used as a methodology in this research finding to study the effect of these factors on quality of technical education in the long run. The rationale behind the study is to find the critical parameters that affect the quality of technical education and whether by controlling them, the quality of the Institute can be enhanced for the betterment of all the stakeholders.

**Keywords:** *System Dynamics, Infrastructure, Quality of technical Education.*



## **STOCHASTIC MODELING FOR SOFTWARE TESTING AND COST OPTIMIZATION**

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### **ABSTRACT**

With the technological revolution, the demand of high-quality software are increasing day by day. A software reliability growth model plays an important role to analyse the software error occurrence and the removal process. The importance of software testing and reliability is due to the continuing growth in the software industry, higher expectations and demand for new and updated versions of software. The objective of present investigation is to develop the software reliability growth model to minimize the number of errors and increase the quality and reliability of the software at optimum cost. In module-based software system, as the number of software modules increases, the efforts associated with the integrity of modules are also increased. We are aimed at to describe the state of art of the development of the software reliability growth models (SRGMs) based on non-homogeneous Poisson process (NHPP). The mean value function of the software defects will be taken into account to determine the optimal release policies of the concerned software models. The overview of continuous SRGMs including worth-noting features, viz. error detection, imperfect debugging, testing-efforts, fault reduction factor, modular software reliability, etc. will be presented. Various performance indices including the testing and operational reliability of the system, availability, mean time to failure, cost function, optimum release policy, expected number of faults in the system etc, will be established. The sensitivity analysis of software release time of the software reliability models incorporating the testing effort with multiple change points will be carried out for specific models.

## **QUEUE THEORETIC ANALYSIS OF MAINTAINABILITY OF A MULTI-COMPONENT MACHINING SYSTEM WITH MIXED SPARES AND HETEROGENEOUS REPAIRMEN**

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### **ABSTRACT**

In the present article a queueing problem of industrial importance has been analyzed from performance prediction view point. We develop Markovian model for a multi-component machining system operating to provide service in normal and short mode both. There is a provision of mixed spares. The failed units are repaired in FCFS fashion and the lifetime as well as repair time are assumed to be negative exponential distributed. The repair facility consists of heterogeneous repairmen which turn on one by one according to a specific rule. When all the spares are exhausted, the failure of units may occur in degraded mode. The first repairman is always active in the system. The second repairman starts the repair when a pre-specified number of failed units is present and is removed if the workload of failed units ceases to the threshold value. For modeling purpose switchover times from failure to repair and from repair to standby and also from standby to operating states are considered negligible. The performance measures namely waiting time, queue length and throughput etc. have been established. The validity of the results has been confirmed by computational illustrations.

**Keywords.** *Markov, Machine repair, Mixed spares, Heterogeneous repairman, System length, operating states.*

## **MARKOVIAN QUEUEING MODEL WITH OPERATIONAL VACATION AND SET UP**

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### **ABSTRACT**

This study is about facility delay in M/M/1 single server Markovian Queueing model with operational vacation. If there is no customer for taking service the server went to operational vacation. During operational vacation queue is formed by the customers for service and server serves the customers at lower rate. From the vacant state server moves to busy state, due to lower service rate when the server break down they go to the repair state. The server busy, break down and server repair follow the exponential distribution. The study state probabilities are obtained in terms of transition rate of inflow and outflow. The matrix analytic approach is employed for the study of the concerned queueing system. The sensitivity analysis is also carried out to analyze the variation of the system performance measures.

**Keywords:** *operational vacation; facility stall; unreliable server; queue size distribution.*

## **A RELATIONSHIP BETWEEN STRESS MANAGEMENT AND EMPLOYEE'S PERFORMANCE- AN EMPIRICAL EVIDENCE FROM IT COMPANIES IN GREATER CHENNAI**

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### **ABSTRACT**

The employees in IT companies predominantly face severity of stress in their workplace as well as in their home. Stress affects their employees both physically and psychologically and hinders them in proving their efficiency in their workplace. Therefore these are very important to identify the causes of stress, consequences of stress and progressive management of stress in both workplace and home. In this context the researcher intended to prove empirically the nature of relationship that exist between stress management and employee's performance. The main aim of this research is to collect the responses regarding stress management from the employees of IT companies and measuring their performance from their organisation through the scores estimated by the organisations through 360° appraisal method. This study is based on primary data under the surgery used convenience sampling method to collect 250 responses from the employees of IT companies. The researcher applied confirmatory factor analysis and linear multiple regression analysis to prove the relationship between stress management and the employee's performance. The study proved that individual stress management and organisational interest in stress management among the employees create optimistic impact on employee's performance. It is further proved that an optimistic stress management leads to very good performance of the employees in their workplace.

## **THE VARIATION IN THE ICT USAGE BY THE YOUNG GENERATION AND OLDER GENERATION OF SECONDARY SCHOOL EDUCATORS IN MAURITIUS**

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### **ABSTRACT**

ICT has become a basic necessary tool in our daily life. It has influenced all the generations, be it young or old. In order to find out the difference in ICT usage between the younger generation of educators and the older generation of educators a study was conducted, and the t-test test was used to determine whether there is a significant difference or not. A survey was administered in Mauritius to 466 secondary school educators who had received training in ICT usage in their related professional duties. The result of the study revealed that there is a significant difference in the usage frequency of ICT and a large variation in the tools used. It showed that the younger generation were more apt to use ICT tools in their professional duties compared to the older generation, despite the same training was given to both.

**Keywords:** *ICT tools, ICT Training, ICT Usage, ICT and Teachers, Younger Educators, Older Educators*

## **SELECTION OF EFFECTIVE CLASSIFICATION TECHNIQUE FOR PARKINSON DISEASE BY COMPARATIVE EVALUATION OF PERFORMANCE OF DIFFERENT MODELS**

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### **ABSTRACT**

Parkinson's disease is a neurological medical condition which affects the motor function in a person. An estimated Parkinson's patient in India is about 1 Million. Identifying Parkinson's disease among healthy persons is a big challenge. Data mining technique provides solution for its detection. It is set of techniques used to extract new knowledge by understanding underlying patterns of the source dataset. In this study, recently published UCI Parkinson Dataset (2019) was used. Initially 10 popular machine learning algorithms were employed, amongst which top five algorithms were selected on the basis of their primary model performance. Feature selection was carried out by using Chi square test to find relevant features and further used for classification studies. Data has been balanced before feeding to the classifier for obtaining unbiased results. The model evaluation was done on the basis of following parameters: accuracy, specificity, F1, precision, AUC and algorithm execution time has also been calculated. Experimental results showed, highest accuracy 88.2% using "Extra Tree Classifier" with all features. Thus, we propose this model as an effective screening tool for detection of Parkinson's disease.

**Keywords :** *Data Mining, Machine learning, Classification, Parkinson's disease.*

## **CROWDSOURCING: DEVELOPMENT & APPLICATION IN MARKETING**

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### **ABSTRACT**

In the maize of marketing jargon, Crowdsourcing has emerged as a contemporary open innovative problem-solving and production business model via Internet. The advent of Web 2.0 in 2005 brought forth new possibilities for interaction and openness which creates added value for enterprises. Crowdsourcing is an evolving phenomenon which taps the use of online crowd's knowledge and productivity to accomplish the tasks once performed by designated agents or employees in the form of an open call format. This study emphasizes on two major objectives: (1.) Explore the development of the process of Crowdsourcing over a period of time. (2.) Applications of Crowdsourcing in the field of Marketing. Although it also covers taxonomy for categorization of crowdsourcing platforms through exemplary cases, ethical issues and possible limitations related to crowdsourcing and potential evolution/ application of crowdsourcing in the coming years. However, various academicians and prominent scholars have presented their views on the scope and importance of crowdsourcing but there limited studies found in Indian context.

Purpose of this research is to provide an extensive and exhaustive literature review on the development, importance of crowdsourcing practice in the sphere of marketing or other related disciplines and the future potential of this phenomenon. It has been found that the implementation of crowdsourcing operations affects the elements of an existing business model and thus it is required to rethink the marketing function and the marketing-mix variables. Various studies have concluded that this process has a wide range of applications in marketing such as new product development, advertising and promotion, marketing research etc. some studies have also been able to highlight the ethical issues and possible limitations of crowdsourcing across different Industries. This study will be useful for the marketers and academicians to get a deeper insight of crowdsourcing and its correlation with marketing objectives.

**Keywords:** *Web2.0, Crowdsourcing, Marketing, Applications of Crowdsourcing, Open Innovative Business Model.*

## **HYBRID APPROACH OF HEALTH CARE DECISION SUPPORT SYSTEM (HCDSS) FOR DISEASE DIAGNOSIS**

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### **ABSTRACT**

Health Care Decision Support System (HCDSS) is an intelligent software based system developed to make health diagnosis process computerized and automated. This type of system is not only used to diagnose disease of human being but is also useful for medical practitioners and intern medical students to verify and analyze their decision. A robust and efficient HCDSS can be developed using machine learning approach which includes Artificial Neural Network (ANN) and Decision tree techniques. In most recent publication, it was found that Hybrid approach of HCDSS is very common nowadays. Several authors have developed HCDSS with the help of many hybrid techniques like ANN and Optimization techniques like Genetic Algorithm (GA), Particle Swarm Optimization (PSO) and many more. The efficiency of hybrid HCDSS is always better than any individual technique.

This paper explores various HCDSS developed so far using hybrid approach to diagnosis various diseases. The literature strengthens the fact that HCDSS is essential in the medical field for the efficient and accurate diagnosis of disease. It also stabilizes that most HCDSS proposed by the authors are based on typical machine learning techniques including the latest Deep learning technique.

**Keywords:** *Health Care Decision Support System (HCDSS), Hybrid Approach, Artificial Neural Network (ANN).*



## **INDIAN EXPORT PERFORMANCE IN PRE AND POST REFORM PERIOD: A REVIEW**

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### **ABSTRACT**

Export plays an important role in growth basket of the Indian economy and India's foreign trade gained remarkable presence in the latter half of the 19<sup>th</sup> century, i.e. the era of post-independence. This period of pre liberalization was initially characterized by near stagnation of exports & later it witnessed a noticeable growth in 70s despite of periodic fluctuations. Indian Export has acquired added significance in the wave of liberalization. The performance of Indian exports has been marked highly encouraging during certain periods after introducing export promotion policies by the government. In this paper we carry in-depth review of India's Exports Performance in Pre and Post reform period. The study is divided in two sub periods of 1950 to 1990 (pre-reform period) & 1991 onwards (post-reform period). This paper achieves objectives i) Identifying the sectors that experienced significant change in exports after liberalization and ii) Finding factors significantly contributed variation in Indian exports. The study is of immense utility for policy makers and exporters.

**Keywords:** *Exports Performance, Pre & Post reform Period, Liberalization, Economic Growth.*

## **ANALYZING THE APPLICABILITY OF BLACK & SCHOLES APPROACH: A SYSTEMATIC REVIEW**

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### **ABSTRACT**

This paper investigates the relevance of the Black & Scholes model by providing a critical analysis of the literature available on the topic, within the field of derivative pricing, focusing specifically on option pricing. The model developed by Black & Scholes has seen major advances in pricing the options and various researchers have provided the theoretical and numerical breakthroughs to minimize the limitations of the existing model. This review paper aims at identifying the relevant literature from 2008 to 2018 to provide useful insights into the academic arena. The process opted for the research was based on a Qualitative approach. Research has been followed by a rigorous review of various papers using the keywords and searching them in different databases, in order to find the explicit range of scientific contribution for the analysis. It finds out the significance, applicability, findings as well as issues relating to its application. From this study, it is evident that the Black and Scholes model introduced in the 1970s has been widely adopted for valuing the option prices in the stock market of different countries. The advances in the model over a period of 10 years provide useful solutions to decision-makers to understand the different methods of evaluating options.

**Keywords:** *Option pricing, Black and Scholes model, Option valuation, European options, Derivative pricing.*

## **A PROPOSED SECURITY FRAMEWORK FOR INTERNET OF THINGS: AN OVERVIEW**

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### **ABSTRACT**

The Internet of Things (IoT) consist of billions of digital devices, public, services and other material things having the potential to effortlessly connect, associate and exchange information, control and monitoring of the material environment by processing, collecting and analyzing the data generated by artistic objects. IoT security and privacy are high on the schema for the general public, enterprises, governments, private media, and ICT companies Due to the potential damage cause to people and property, public distrust, administrative sanction, and even threats to national concern, For societies and economies to realize the optimistic benefits of the IoT, all key stakeholders need to proactively believe safety, security, and privacy during the complete IoT supply series. To address this drawback, we propose a framework for modeling and assessing the safety of the IoT and supply a proper definition of the framework. Generally, the framework consists of five phases: (1) security model generation, (2)security visualization, (3)processing,(4) security analysis, and (5) model updates. Using the framework, we are able to find potential attack situations within the IoT, analyze the safety of the IoT through well-defined security metrics, and assess the effectiveness of different defense ways.

**Keywords:** *IoT, sensors, GPS, GSM, Google map, security, authentication, framework,*

## ON $(E,1)(C,\alpha,\beta)$ PRODUCT SUMMABILITY OF FOURIER SERIES AND ITS CONJUGATE SERIES

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### ABSTRACT

Summability is a branch of mathematical analysis in which an infinite series which is usually divergent, by ordinary summation techniques can converge to a sum  $s$  (say) and become summable with the help of different summation means or methods.  $C$  method was given by Ernesto Cesaro such that ordinary Cesaro summation was written as  $(C,1)$  summation whereas generalized Cesaro summation was given as  $(C,\alpha)$  ( $\alpha > 0$ ). Euler provides Euler summation formula which sums infinite series called  $(E,1)$  summation method. Product  $(E,1)(C,1)$  summation given by H.K. Nigam and Kusum Sharma [7]. Mishra and Joshi [9] defined the product  $(E,1)(C,\alpha)$  so that the series which can't be summable by  $(E,1)(C,1)$  method can be made summable by  $(E,1)(C,\alpha)$  method. Mishra and Srivastava [10], introduced the summability method  $(C,.)$  for functions by generalizing  $(C,\alpha)$  summability method. In this paper, we define the product summability  $(E,1)(C,\alpha,\beta)$  ( $\alpha > 0, \beta > -1$ ) of Fourier series and its conjugate series and investigate some of its properties.

**AMS Subject Classification:** 42B05, 42B08.

**Keywords:**  $(E,1)$  means,  $(C,\alpha)$  means,  $(E,1)(C,\alpha)$  product means, Fourier Series, Conjugate Series, Lebesgue Integral.

## **APPLICATION OF CONTRACTION IN Menger SPACE**

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### **ABSTRACT**

Since every metric space is a probabilistic metric space with natural distribution function without holding converse and therefore results given by us in section 2 are true in more generalized setting of probabilistic metric space. In this paper the concept of dual contraction mappings has been defined in probabilistic metric space and using this we have obtained a number of fixed point theorems in the light of some new contractive conditions.

**Keywords:** *metric space, probabilistic metric space*

## **A COMPARATIVE ANALYSIS OF CLASSIFICATION TECHNIQUES IN MOVIE REVIEW**

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### **ABSTRACT**

Text Classification is one of the important ideology through which we can analyze opinion mining, sentimental analysis, review of data and semantic analysis. In this research paper we have applied different preprocessing steps to reduce the features from movie review data set and create a structure data set. The second important step is feature selection in which less important features are removed from the original feature space. We have used two methods to reduce feature selection like Correlation-based feature subset selection and chi-square where Correlation-based feature subset selection and chi-square feature selection technique for gathering most valuable words for movie review dataset. We have formed new optimized data set after applying preprocessing and feature selection techniques. We have used various classifiers like Support Vector Machine (SVM), Multilayer Perceptron (MLP), Naive Bayes (NB), Bayes Net (BN) and Random Forest (RF) for classifying the movie review data as positive or negative and also compared the performance of classifiers where SVM gives better accuracy compared to other classifiers.

**Keywords:** *Text Classification, Movie Review, Feature Selection.*

## **CONTEMPORARY DIGITAL REVOLUTION-WITH SPECIAL REFERENCE TO INDIAN CONSUMERS BUYING PATTERN**

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### **ABSTRACT**

This paper aims to examine the paved path of digitalization, the use of digital media platforms by applying a critical study of Indian consumers. This research paper tries to reveal the active rise of android mobile phone users in India resulting in the business opportunity set up by gigantic players of online businesses like eBay, Amazon, and others. Consumers play no longer as a silent viewer but participate as an active medium with the contemporary digital mediator reflect the same this paper also aims at investigating and determining the effectiveness of contemporary digital Revolution and its effective impact in attracting different customer groups across India and also emphasizing on the analytical change in the buying pattern of Indian Consumer, the study also, in particular, encompassing the changes that e-retailers are making in terms of E-Marketing Mix in accordance to the contemporary digitalization mode. Research is based on the various observations of secondary data analysis of ongoing online revolutionary activities and changes implemented by the gigantic online players according to the mind-sets of Indian consumers.

**Keywords:** *Digitalization, Indian consumer, E-retailers, Understanding customers, Customer segmentation, E-Marketing Mix.*

## **TRENDS IN DIGITAL MARKETING: EFFECTIVENESS OF ADVERTISING THROUGH SOCIAL MEDIA: INDIA AND GLOBAL CONTEXT**

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### **ABSTRACT**

This paper is an attempt to investigate 'how' the use of social media marketing is digging into through important channels of digital marketing and increasing the visibility of Businesses over important platforms. Social media marketing is also an important Component in public relations as an Organisation is using social networking sites to build a relationship with the key publics and providing a variety of organization information over social media. This is an attempt to investigate the data quantitatively with case study method for in-depth understanding of the role digital marketing and its effectiveness in Indian as well as in global context. For this quantitative research a structured questionnaire has been designed and administered online and personally. The finding depicts that there is effective results of advertising through social media platforms as the increase in active android mobile phone uses is rising with increasing numbers in the Indian population.

**Keywords:** *Social Media Marketing, Digital Marketing, Online Shopping, Internet Searching, Search Engine Optimization, Indian Costumers.*



## **MARKETING STRATEGIES FOR THE GROWTH OF INDIAN LEATHER INDUSTRY**

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### **ABSTRACT**

The paper comprises of the worldwide Leather market size (value, capacity, production and consumption) in key regions like Asia (Top exporters like India, China etc.), North America, Europe, Asia Pacific and other regions. Global Leather market size will increase to Million US\$ by 2025. In this study, 2017 has been considered as the base year and 2018 to 2025 as the forecast period to estimate the market size for Leather.

This research includes global Leather breakdown data by manufacturers, region, type and application, also analyses the market status, market share, growth rate, future trends, market drivers, opportunities and challenges, risks and entry barriers, sales channels, distributors and Porter's Five Forces Analysis.

The paper also aims at studying marketing activities in the leather industry those are more over similar to the companies in a global competitive environment. Benchmarking of international activities, monitoring competitor countries, adopting models from the best practices of other countries and improving marketing activities are utmost important. Assessment of many industrial promotion factors will be guiding for the benchmarking activities to be conducted, or enable optimizing many activities. This study also gives a snapshot of marketing activities of world leather industry in today's situation.

**Keywords:** *Global leather market, Benchmarking, Market drivers, Production process.*

## **OPTIMIZATION OF PRODUCTION: EFFECTIVE IMPLICATION OF TPM & TQM IN PRODUCTION LINE OF FOOTWEAR INDUSTRY**

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### **ABSTRACT**

The prime focus of this research is on ‘how’ Footwear industry has gone through significant changes in the recent year and has risen dramatically in the global scenario. Customers focus on product quality, product delivery time and cost of product. Because of these, a company should introduce a quality system to improve and increase both quality and productivity continuously. Total Productive Maintenance (TPM) is a methodology that aims to increase the production hence reducing the need for further the Capital investment. The relationship between total quality management (TQM) and innovation is complex. Literature suggests that conflicting arguments exist and that the impact of TQM on innovation depends both on the specific quality management element under consideration and on the type of innovation.

In this research, our goal is to analyze at what extent the introduction of TQM is indeed supporting innovation in the footwear industry. Since this is a mature industry, whose traditional corrective base is disappearing and where familiar to medium units dominates, our emphasis is on the study of the organizational requirements to adopt constant changes in process technology. Investment in human resources can further result in better hardware utilization, higher product quality and reduced labor costs. The aim of the work is to study the effectiveness and implementation of the TPM programmer for footwear industry.

**Keywords:** *TPM, TQM, Production optimization, Production line, Footwear Industry.*

## **APPLICATION OF THE EMPIRICAL ENSEMBLE MODE DECOMPOSITION METHOD TO STUDY CLIMATIC INFLUENCE OF CABBAGE YIELDS IN MAURITIUS**

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### **ABSTRACT**

In this paper the Ensemble Empirical Mode Decomposition (EEMD) method is employed to study the trends in cabbage crop yields in the island of Mauritius and their correlation with climate variability occurring in the Indian Ocean. In the EEMD process, a non-stationary time series is decomposed into Intrinsic Mode Functions (IMFs) and a residual. The IMFs provide information about the oscillation periods in the data while the residuals give the data trend. Monthly production yield data (in tonnes/acres) for cabbage are analysed for the period January 2006 to December 2017 for 'North', 'South', 'East' and 'Central West' regions of the island. The EEMD process results into 5 IMFs and the computed mean period of each IMF suggests that the climatic phenomena which impact more on cabbage yields in Mauritius are the seasons, tropical cyclones, intra seasonal phenomena, quasi-biennial oscillations and El-Nino Southern Oscillation. The residuals reveal a general linear increase of cabbage yields per year from 2006 to 2013 at a rate ranging from 1.07 tonnes/hectares in the South to 17.75 tonnes/hectares in the Central West region. Then from 2013 onwards, a net decrease in the yearly yields at a rate ranging from 2.35 tonnes/hectares in the North to 2.93 tonnes/hectares in the South is observed.

**Keywords:** *Climate variability, Crop yield, Empirical Ensemble Mode Decomposition (EEMD), Intrinsic Mode Functions (IMFs), Climate Change.*

## COMPARATIVE STUDY OF RISK ASSESSMENT FOR INDUSTRY 4.0

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### ABSTRACT

Industry 4.0 (I 4.0) is not just a buzzword anymore but has been the key to success for many organizations globally. The movement of the 4<sup>th</sup> Industrial Revolution is paving its way to reaching the new paradigm of global excellence in production. Hence it is but obvious to pay attention to the key pillars and risks associated with I 4.0 before stepping forward for transition. This study is a holistic approach to find the best MCDM methods in given conditions and constraints to assess the risks associated with implementation of I 4.0. The research paper is an effort to highlight, assess and analyze the risks related to I 4.0 in the company identified for the study. The risks considered for study are both external and internal mainly related to the triple bottom line of sustainability along with technical and political. A framework is suggested to avert the risks through systematic assessment and evaluation in order to mitigate the turbulence while transition towards I 4.0. The identified risks have been first defined and classified in the academic framework. After that, the set of risks are assessed by applying four MCDM methods. The problem is categorically defined by considering the matrix of five alternatives (risks) and ten criteria precisely chosen to cover the widest ambit of the I 4.0 vision. Furthermore, the outcomes of all the four methods have been compared to conclude the best method. The relative performances of these methods have been tested by Spearman rank correlation coefficient and Kendall's coefficient of concordance based on the respective rankings of the alternatives. The findings of the research is very commendable as three out of the four methods have shown the agreement in ranking. The results has been critically assessed and examined by the experts of the same company before considering it viable for the implementation.

Findings of Kendall's tau\_b and Spearman's rho

	EDAS		MABAC		PROMETHEE II		WASPAS	
	KD	SR	KD	SR	KD	SR	KD	SR
EDAS	1.000	1.000	.800	.900*	.600	.800	.200	.200
MABAC	.800	.900*	1.000	1.000	.800	.900*	.400	.500
PROMETHEE II	.600	.800	.800	.900*	1.000	1.000	.600	.700
WASPAS	.200	.200	.400	.500	.600	.700	1.000	1.000

KD: Kendall's tau\_b      SR: Spearman's rho

**Keywords:** Industry 4.0, Risk assessment, Performance test, Multi-Criteria Decision-Making Method (MCDM).

## **ASSESSMENT ON ARTIFICIAL INTELLIGENCE IN AGRICULTURE**

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### **ABSTRACT**

By using Artificial intelligence methodology in agriculture, we can resolve many issues like automated farming activities, identification of pest and diseases, identifying crop quality. Various factors can affect the yield of crop production; these factors are discussed in this paper. By implanting Drone technology we will give high Tech makeover with planning & strategy based on real-time data gathering. Forecast of expected weather can be obtained in time using satellite & Doppler radar. Each satellite is having two types of sensors such as Proximity Sensing and Remote Sensing technologies which are used for data compilation. These sensors gathers the data on climatic condition, soil moisture & fertility and also used to measure and send data regarding air temperature, air humidity, atmospheric pressure, soil temperature. Drones, which are used for agriculture purpose, are called agriculture drones either controlled by pilot or by ground. Future Drones are solar based. In this paper we show how AI is used in agriculture for better quality and quantity of crop.

**Keywords:** Artificial intelligence, agriculture, smart farming and sensors.

## **OPTIMUM COST REDUCTION IN LOT SIZING GAME BY NASH SECURITY POINT IN THE DEGREES OF HORIZONTAL AND VERTICAL COOPERATION**

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### **ABSTRACT**

There is a competition between two cooperative team of players to reduce the total cost of inventory at the source. The players are enhancing the degrees of horizontal and vertical cooperation with the investment of linking cost in the random network of supply chain. In literature, there is a gap between measure of degrees of cooperation and its effect on lot sizing game in supply chain. Hence, we establish line of regression between the degrees of horizontal and vertical cooperation. And we search equilibrium solution to decide the both degrees at particular node of supply chain. It is known as Nash security point of this competitive game which helps to determine economic order quantity (EOQ), when horizontal links reduce the carrying cost and vertical links reduce the ordering cost. This paper provides an idea about effect of successful meetings among industries (horizontal cooperation) and successful meeting between industry to purchasing firms (vertical cooperation) on the total cost of inventory management. This helps to firms on deciding which type of cooperation is required to improve and how much.

**Keywords:** *Lot Sizing Game, Degrees of Cooperation, Horizontal cooperation, Vertical cooperation, carrying cost, ordering cost.*

## **REVERSE APPRAISAL PERFORMANCE OF AN PRIVATE EMPLOYEE: A STUDY**

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### **ABSTRACT**

Appraisal is a very excited word for any employee. Performance appraisals is a task which measuring the qualitative and the quantitative measurement of any employee in any private or government organizations. Performance refers to a set of outcome produced during a certain period of their job time. Appraisal is the evaluation of worth, quality or merit. In this research paper we have studied different appraisals methods and their effect into the employee in any private organization. We have also studied about the reverse performance appraisal system which is an important technique to develop the individual's performance. We have studied to investigate the effectiveness of reverse performance appraisal for enhancing the productivity and performance of employees. Appraisal of any employee is depends on many factors like sincerity about work by any employee, completion the task in due date, target achieved at time limits and many more things. We have also studied different criteria for employee to assessment.

**Keywords :** *Appraisal, Reverse Performance, Productivity.*

## **EXERGETIC ANALYSIS OF WIND ENERGY RESOURCES**

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### **ABSTRACT**

The first law of thermodynamics deals only with energy quantity and proclaims change in energy of a system, together with change in energy of its surrounding. Yet, to identify the work potential of a system, the ‘quality’ of the energy is more essential, and this can be expressed by the term ‘exergy’. The exergy content of a system is usually split into kinetic exergy, physical exergy, chemical exergy and potential exergy which gives a more realistic background on the performance of the system. Hence, its use to study wind energy systems has gathered an increasing interest among researches in the last decade. In this paper, an exergetic analysis of the wind energy resources over the island of Mauritius is conducted. The physical exergy of the wind is calculated by using the meteorological variables such as temperature, humidity ratio, pressure and wind speed at 60 magl, obtained from running the Weather Research and Forecasting model (WRF) over a period of one year. A high-resolution mapping of the physical exergy is generated. Finally, the exergy and energy efficiencies of a commercial wind turbine of 850 kW is compared at two locations over the island, namely Plaine des Roches and Plaine Sophie. It is found that, in general, the exergy efficiency is lower than the energy efficiency. It is also noted that the exergy and energy efficiencies in Plaine Sophie are better than at Plaine des Roches for wind energy harvesting.



## **SYNTHESIS, SPECTROSCOPIC, FLUORESCENCE AND MORPHOLOGICAL STUDIES OF MIXED LIGAND COMPLEXES OF EUROPIUM (III) AND YTTERBIUM (III) METALS**

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### **ABSTRACT**

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We have synthesized a series of four mixed ligand complexes of the type  $[\text{Ln}(\text{L}_1)(\text{L}_2)(\text{NO}_3)_2] \cdot x\text{H}_2\text{O}$  **1-4** [where  $\text{Ln} = \text{Yb(III)}$  **1, 3**,  $\text{Eu(III)}$  **2, 4**,  $\text{L}_1 = o\text{-vma}$  **1-4**,  $\text{L}_2 = \text{dien}$  {diethylenetriamine} **1-2**,  $ea$  {ethanolamine} **3-4**] by the equimolar reaction of  $\text{Ln}(\text{NO}_3)_3 \cdot 6\text{H}_2\text{O}$ ,  $\text{L}_1\text{H}$  and  $\text{L}_2$ . These complexes are characterized by IR, UV-Vis, Mass spectra and Fluorescence. The morphology of all complexes were characterized by SEM-EDS. These all complexes are soluble in polar organic solvent. In these complexes,  $\text{dien}$  act as a tridentate ligand and  $ea\text{H}$  act as a bidentate ligand.

## **ANALYSIS OF RELIABILITY CHARACTERISTICS OF A TWO NON-IDENTICAL UNIT STANDBY SYSTEM MODEL WITH DIFFERENT REPAIR MODES**

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### **ABSTRACT**

The system consists of two non-identical standby units, assuming that one unit is operative and the other is a cold standby mode. Upon failure of an operative unit the cold standby unit becomes operative instantaneously. Using regenerative point technique, various reliability characteristics of a two non-identical unit stand by system model with repair, inspection and post repair are obtained. Failure and repair time distributions of each unit are taken as Weibull with common shape parameter but different scale parameters.

**Keywords:** *Reliability, Mean time to system failure (MTSF), Availability and Regenerative point.*

## **A STUDY ON ACHIEVEMENT MOTIVATION OF PRIMARY SCHOOL TEACHERS IN MAURITIUS**

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### **ABSTRACT**

Achievement motivation is a construct originated from motivation, which has traditionally been used to describe and explain differences in intensity and direction of behavior. It indicates how motivated the teachers are to achieve at a higher level. The aim of this study was to investigate the level of achievement motivation of primary school teachers in Mauritius through the use of the Achievement Motive Test (Based on Sentence Completion Method) by V.P. Bhargava. The results revealed that Mauritius primary school teachers have an average level of achievement motivation. Secondly, no significant difference was found between gender and this factor. Despite the fact that no significant relationship was found with gender, further tests revealed that there was an association between gender and different levels of the factor with more women having high level of achievement motivation than male educators and less women having low level of achievement motivation as compared to their male colleagues.

**Keywords:** *Achievement Motivation, Primary School Teachers, Mauritius*

## **THE IMPACT OF GRATITUDE AS A RELATIONSHIP DRIVER IN RELATIONSHIP MARKETING (RM): SMALL AND MEDIUM ENTERPRISES IN MAURITIUS**

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### **ABSTRACT**

In the last few decades both marketing theory and practice have gone through a major transformation process. From the traditional 7 Ps Marketing Mix Model focusing on Product, Price, Place, Promotion, People, Process and Physical Environment, Marketing has shifted to a relationship based approach.

A relationship can basically be defined as *“the way in which two or more people or things are connected, or the state of being connected”*. *“The way in which two or more people or groups regard and behave towards each other”* is also an interpretation of the term “relationship”.

Through the flow of time and changing business environment, there has been a natural evolution from Transactional Marketing to Relationship Marketing. The notions of bonding, empathy, reciprocity and trust are the fundamental construct of the Relationships Drivers Model impacting the quality of relationships being supported by Relationship Marketing.

Lately marketing researchers have been investing their efforts to identify the significant components of the buyer-seller relationships. Trust and commitment have been the two relational components which have been the most studied (Morgan and Hunt, 1994; Fullerton, 2005). More recent research by Palmatier and his colleagues has positioned gratitude as a key component in the RM model.

Common emotional responses to receiving a benefit are delight, indebtedness and gratitude. Delight is a customer’s emotional response to a surprising positive departure from expectations (Schneider and Bowen, 1999). Customer gratitude is a voluntary, other-directed emotional response that arises from the recognition that a benefit has been received from a seller (Bonnie and de Waal, 2004; Buck 2004; Komter, 2004).

Gratitude and the moderating effect of benevolence are important components of business-to-customer relationships (Morales, 2005). The aim of this research work is to study the phenomenon of Gratitude in the buyer-seller relationship and its relative importance as a key Relationship Driver in RM.

The research will be divided in two parts. The first part of the study, termed as the exploratory phase, will focus on understanding whether the local SMEs are knowledgeable about relationship marketing and if yes, how they are implementing RM strategies to get closer to their respective customer base. Focus groups will be used for interactions with the main stakeholders. The second part of the study will rely on primary data gathering via questionnaires.

This research work has the ambition to close the gap in knowledge as to the application of Relationship Marketing as an essential path in doing sustainable business by SMEs. During the course of the research, a more precise picture of the use of RM will be set. The elaboration of a business model encompassing RM and the organisation is also expected.

The biggest challenge that the proposed research project is going to face will definitely be obtaining the trust of the prospective respondents both companies (sellers) and customers (buyers).

**Keywords:** *Relationship Marketing, gratitude, buyer-seller relationship, bonding, small and medium enterprises, empathy*