Journal of Scientific & Industrial Research

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CONTENTS

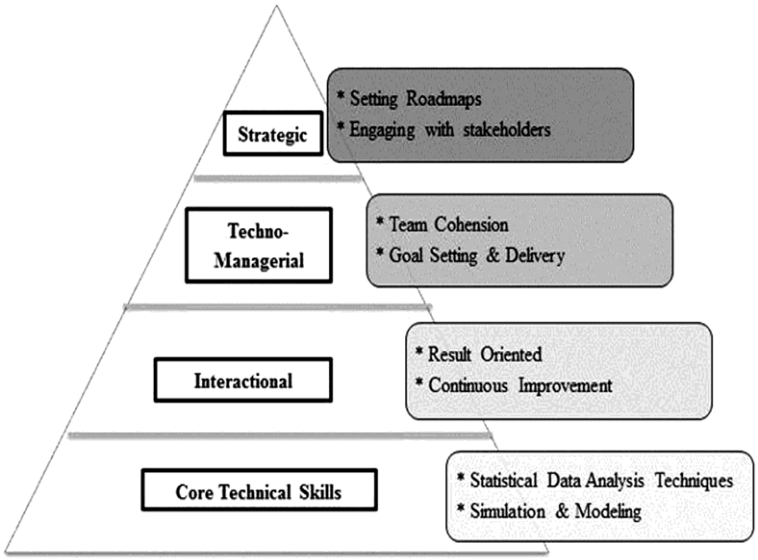
Management & Information Technology

11	**Comparative Analysis of Financial Industry Competitiveness of Regions in China** **Yao Fu, Weida He & Rong Ha**	This paper takes 31 provinces and cities in China as the research object, establishes the financial industry competitiveness evaluation index system, and compares the financial industry of Beijing-Tianjin-Hebei with that of the Yangtze River Delta. The results show that the scale, financial performance, financial security and radiation capacity of Beijing financial industry are high and Hebei financial industry relies on the radiation of Beijing and Tianjin. Compared with the Yangtze River Delta, the development of financial industry in Beijing-Tianjin-Hebei region is unbalanced and the level of financial competitiveness is quite different.
15	**Corporate Reputation, Financial Performance and Earnings Quality** **M A Fernández-Gámez, A del Castillo, D Alaminos, José António C Santos & E Alcoforado**	An important issue frequently assessed by investors is the quality of reported financial information. Recent research suggests a relationship between corporate reputation (CR) and the quality of reported information. This paper examines the association between CR and earnings quality of the firms operating in a European market. We use a two-stage method, applying a cross-sectional accruals-based measure as a proxy for earnings quality, and a regression analysis to detect relationship between earnings quality and CR. Our results suggest that most reputable companies also have superior earnings quality. These findings may increase the confidence of investors in assessing the earnings quality of firms with a higher CR. It may also be of interest to business managers who are establishing a corporate strategy based on CR.
19	**Stochastic Multifacility Location Problem under Triangular Area Constraint with Squared Euclidean Norm** **A K Santra**	This investigation is the extension of our previous work in which it is required to find the locations of a number of new facilities in a prescribed triangular area constraint with respect to a given number of existing facilities where the weights considered in the objective function are the random variables with discrete probabilities and the distance between the facilities is Squared Euclidean. The stochastic multifacility location problem under Squared Euclidean norm with triangular area constraint has been formulated and solved by using Kuhn-*Tucker* conditions**.** Numerical example has also been solved by using the proposed method. Thus the outcome of the present work is a new method of finding the solution of a constrained stochastic multifacility location problem with Squared Euclidean.

CONTENTS

22 **Development of Competency Model and Mapping of employees Competencies for Organizational Development: A New Approach**

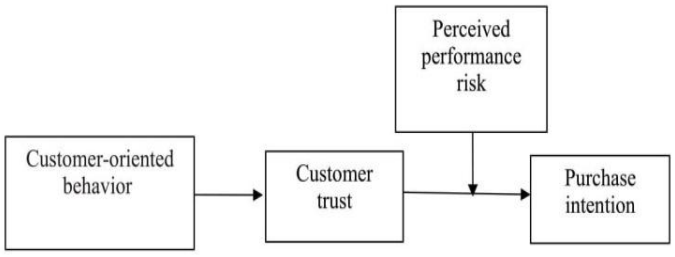
Competency model is an effective HR tool to identify the competencies needed with relevance to specific role and is extremely useful in the entire spectrum of Human Resource Development. This study is a strong business case of one of the R&D working to assess and mitigate avalanche hazards in Indian Himalaya-the abode of snow. A competency model consisting of specific techno-managerial vis-à-vis technical skills w.r.t organization has been developed. All the scientists were mapped against developed competency model and based on gap analysis the training needs have been suggested for organizational development.



J Kansal & N Jain

26 **The Interaction between Service Employees and Customers toward the Increase of Purchase Intention: An Evidence from Service Industry**

The purpose of this study is to explore the managerial question of how travel agents may interact with customers toward the increase of purchase intention of tour packages within a perceived performance risk context. This empirical study utilizes moderated mediation techniques for data analysis. The findings indicate that the consumer perceived performance risk influences the mediated relationship between travel agent customer-oriented behavior and purchase intention via customer trust. The implications indicate that travel companies in a service sector of high perceived performance risk may benefit from incorporating travel agents acting in customer-oriented behaviors in order to increase customer confidence and trust in purchase decision making



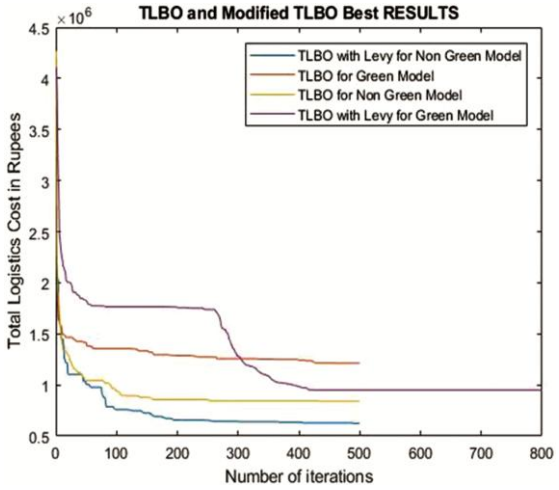
Yu-Chi Wu, Grace T R Lin & Jan-Ruei Lin

CONTENTS

31 **Modelling and Analysing an Integrated Multi channel Food supply chain Distribution of an Indian Dairy Firm using Modified TLBO Algorithm**

T Niranjan & P Parthiban

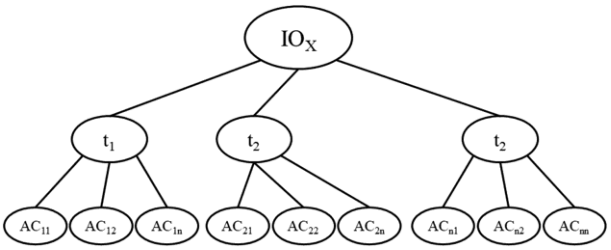
Transportation related expenses forms a main chunk of product cost in a multi-stage manufacturing supply chain. The pressure on firms to reduce carbon emissions to go green had emerged in recent years due to government regulation, need for best possible allocation of available resources, competition from green players and rising awareness on environment protection in the minds of people. Given the increasing focus on emissions by several countries, we also incorporate an emission or pollution factor in our objective. Nowadays many manufacturers have started using more than one channel to connect with their customers to improve their reach; this led to the formation of multi-channel supply chains. Also, we attempt to deal with transportation related costs considering environmental issues while designing of a multi-channel supply chain of delivery system for a Diary firm. Teacher-Learner-Based Optimization (TLBO) which does not involve any algorithm specific parameters is applied to solve the problem. The conclusion shows that levy flight distribution in teachers' phase of TLBO performs better than traditional TLBO.



CONTENTS

35 **A Content Proposer System (CPS) Based on Deficiencies of Confidence Based Learning (CBL)**

There has been a dramatic change in the Teaching and Learning System across the globe. The use of technology in learning arena has brought paradigm shift. This has led to a separate research domain known as Technology Enabled Learning (TEL). E-Learning is an important research area which not only improves the performance of the Learners but also provides flexible and efficient learning solutions. Confidence Based Learning (CBL) is a newer development in the field of e-Learning that is not only concerned to the development and dissemination of the Learning Content but also provides a comprehensive and holistic assessment approach using 2-dimensioanl assessment technique. This research work proposes a methodology that identifies the related learning content or competencies from the deficiencies identified during diagnose phase. Each learning chunk known as Learning Object (LO) is based on Instructional Objectives (IO). Each IO is further divided into a number of tasks. Each task is divided into several atomic competencies (ACs). An algorithm is proposed for the system that maps the AC from the deficiencies identified for a particular learner. The proposed system once implemented will handle prescription of customized learning content in an efficient manner. A case study has been used to illustrate the technique for an industrial application which shows state of the art diagnosis and prescription with analysis of results.

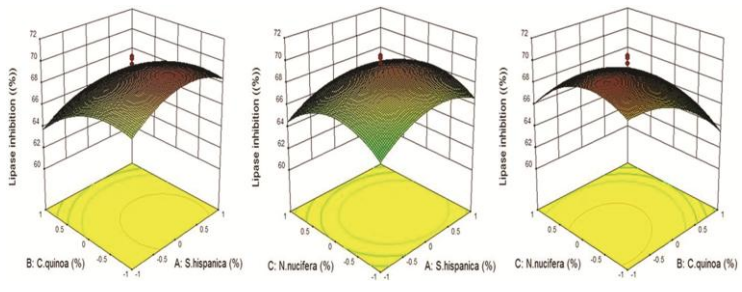


R Chatterjee & J K Mandal

S & T and Industrial Research

39 **Optimization of an Antihyperglycemic Triherbal Formulation using Response Surface Methodology**

The present study was aimed to optimize the combination of methanolic extracts of *Salvia hispanica*, *Chenopodium quinoa* and *Nelumbo nucifera* seeds for developing an anti-hyperglycemic triherbal formulation with multifunctional potentials based on Response Surface Methodology using central composite design. A three- level factorial design was applied to determine the combined effect of three independent variables (*S.hispanica*:A;*C. quinoa*:B and *N.nucifera*: C) on inhibition of four responses (α- amylase: R1; α-glucosidase:R2; DPPH:R3 and Lipase:R4). The three factors were coded at five levels (−α, −1, 0, +1 and + α), which resulted in 20 experimental runs. The optimum concentration showing α-amylase (79.51%), α-glucosidase (82.97%) and lipase (70.47%) inhibitory activities with DPPH (83.47%) scavenging potential was found to be 1 mg/ml. A quadratic polynomial equation was found to best fit the model with α-amylase R^2 = 0.891, α-glucosidase R^2 = 0.911, DPPH R^2 = 0.904 and lipase R^2 = 0.915. The lack-of-fit values were insignificant ($p > 0.05$) for all four second-order equation. The analytical method was validated and the results were found closer to the predicted values. The optimized formulation was chosen further to develop the triherbal antihyperglycemic formulation.

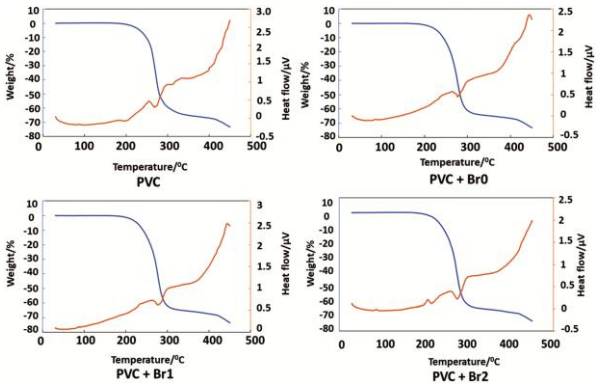


Tanisha & M Majumdar

CONTENTS

46 **Salen Type Copper (II) Complexes as Flame Retardants for PVC Sheets**

Salen type copper (II) complexes have been synthesized by the reaction of salicylaldehyde, 5-bromosalicylaldehyde and 3,5-dibromosalicylaldehyde with ethylenediamine and copper(II) acetate monohydrate. The synthesized complexes were used in poly(vinyl)chloride (PVC) formulations and examined for flame retardant properties. The casted sheets were analyzed through simultaneous TGA and DTA thermal techniques. The combustion points of PVC sheets with Br0, Br1 and Br2 complexes were determined and found higher by 9.43, 10.67 and 6.03 ^{0}C, respectively, in comparison to control sample. Furthermore, the mass spectrometry results suggest that bromine substituted copper (II) complexes are environmentally safe and can be used as effective flame retardants in PVC formulations. The casted PVC sheets may find applications as fire retardant polymers in cables, panels, doors, windows, furniture etc.

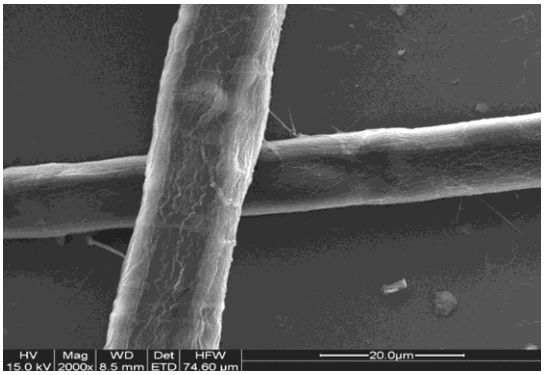


Meenu Teotia, Anjali Verma, Takashiro Akitsu, Shinnosuke Tanaka, Tomoyuki Haraguchi & RK Soni

Energy and Environment

50 **Reduction in Refining Energy and Improvement in Pulp Freeness through Enzymatic Treatment – Lab and Plant Scale Studies**

Lab as well as plant scale studies were carried out on enzymatic refining of mixed hardwood pulp aiming reduction in refining energy and improvement in fiber freeness. For the study different commercially available enzymes were used. Enzymatic treatment of pulp reduced refining energy by 29.3% in the laboratory scale experiments and by 20% in the plant scale trials conducted at a wood based paper mill. Enzymatic treatment of pulp improved the drainage of pulp by 11.1% in the laboratory scale experiments and improved FPR by 3.0%, FPAR by 3.6% in plant trial. During plant scale trial breaking length of the paper was improved by 14.7-17.4%.



S Tripathi, P Verma, O P Mishra, N Sharma, N K Bhardwaj & R Tandon

Author-Reader Platform

55 **Instructions to Contributors (Extended)**

CONTENTS

Author Index

A del Castillo 15
A K Santra 19
D Alaminos 15
Grace T R Lin 26
J K Mandal 35
J Kansal 22
Jan-Ruei Lin 26
José António C Santos 15
M A Fernández-Gámez 15
M Majumdar 39
N Jain 22
N K Bhardwaj 50
N Sharma 50
O P Mishra 50
P Parthiban 31
P Verma 50
R Chatterjee 35
R Tandon 50
RK Soni 46
Rong Hao 11
S Tripathi 50
T Niranjan 31
Tanisha 39
Weida He 11
Yao Fu 11
Yu-Chi Wu 26

Keyword Index

Antihyperglycemic 39
Antilipase 39
Beijing-Tianjin-Hebei 11
CBL 35
Cellulase 50
CMCase 50
Competency 22
Corporate Reputation 15
Customer Trust 26
Customer-oriented Behavior 26
Dairy Firm 31
Dependency Structure Matrix (DSM) 35
Drainage of Pulp 50
DTA thermal techniques 46
Earnings Quality 15
e-Learning 35
Financial Analysis 15
Financial industry competitiveness 11
Financial Performance 15
Green 31
Human Resources (HR) 22
Industrial Training using CBL 35
Knowledge Based Organisation (KBO) 22
Kuhn-Tucker Conditions 19
Levy Flight 31
Mapping 22
Moderated Mediation 26
Multi-Channel Supply Chain 31
Multifacility Location 19
Optimization 39
Perceived Performance Risk 26
Physical Strength Properties 50
Principal Component Analysis 11
Purchase Intention 26
PVC sheets 46
Refining Energy 50
Refining of Pulp 50
RSM 39
Skills 22
Squared Euclidean 19
Stakeholders 15
Statistics 22
Stochastic 19
Technology Enabled Learning (TEL) 35
TGA 46
TLBO 31
Triangular Area Constraint 19
Triherbal formulation 39
Xylanase 50