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Constructing a Strategy Map for Manufacturing Companies with Key Indicators of the Balanced Scorecard (Case Study: Mihan Company)

Seyed Majid Elahi [1], Sara Hasanzadeh [2], Mojtaba Dadras [3], Narjes Zafari [4]

Abstract: The aim of this paper is to construct a strategy map for a manufacturing company. To do so, based on the four aspects of the balanced scordcard, key performance indicators (KPI) were selected by a committee of experts. Then, the Decision Making Trial and Evaluation Laboratory (DEMATEL) method was used to determine the type and intensity of relationships between key performance indicators and focus mainly on distinguishing performance indicators into cause indicators and effect indicators. Similarly, the main affected aspect and the main causal aspect are distinguished. The result can be used for other production companies as guidance moreover; it effects on development of strategy map based on BSC and offers a combination of these two techniques along with DEMATEL. This combination causes improvement in planning and operation of related industries.

Keywords: ***Balanced Scoredcard, DEMATEL Method, Key Performance Indicators, Strategy Map.***

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Design of a Fuzzy Linear Regression Model for Forecasting Transport Energy Demand (Case Study: Iran)

Mohammad Reza Taghizadeh Yazdi [1], Hamed Shakouri [2], Mohammad Bagher Menhaj [3], Mohammad Reza Mehregan [4], Aliye Kazemi [5]

Abstract: In this paper, the energy demand of transport sector from 1385 to 1400 is forecasted based on Fuzzy Linear Regression (FLR) approach considering economic and social indicators. In order to analyze the influence of economic and social indicators on energy demand of transport sector, Gross Domestic Product (GDP), population and the total number of vehicles in 1372-1384 were regarded. In this research, the energy consumption may achieve a level of 625 MBOE per year by 1400. The results compared with the multiple regression method reveal much less mistakes. The average absolute error percentage reached from 12.33% to 5.72%.

Keywords: ***Forecasting, Fuzzy Linear Regression, Transport Energy Demand.***

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Identification and Prioritization Factors Affecting Site Selection of Dry Ports to Enhancing Competitive Performance of Seaport Services Using DEMATEL and ANP

Ali Heidari [1], Hosein Safari [2], Fatemeh Narimani [3]

Abstract: Site selection of dry ports hasn't been studied in IRAN as academic research or public research. So, the main purpose of this research is to list and prioritize all the factors affecting site selection of dry port in IRAN. These factors are selected according to competitive advantage of seaport performance and considered the needs of customers and actors involved in transportation industry. Then, the causal relationships and relative importance weights of the factors are computed using the ANP and DEMATEL. In conclusion, transportation network, transportation cost and Proximity to market, industrial region and market are key factors that should be considered when choosing dry port locations. Further, this paper will provide transportation policymakers with a better understanding of the relevant issues under consideration.

Keywords: ***Competetive Performance of Seaport Services, DANP, Dry Ports, Location Selection.***

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Evaluation of R&D Activities in Iran: Data Envelopment Analysis Approach

Mohammad Zarei Mahmoudabadi [1], Mohamad Hosein Tahari Mehrjardi [2], Alireza Mahdavian [3]

Abstract: Today, capacity, development and real independence of countries largely are linked with the ability to produce and publication of science. Purpose of this research is evaluation of the relative performance of research and development performance of Iran in compared with the region's countries by combined approach of DEA/TOPSIS. To this end, research and development activities of fourteen countries from the region's countries were extracted. In this regard, to assess the relative efficiency of region's countries, inputs (such as: enrollment rates in the sciences and engineering, researchers of research and development, R&D spending) and output (such as: the number of engineering and scientific articles, patents and exports received from the international advanced technology) were used. For performance evaluation of countries, inputs and outputs of 49 different combinations were used. Finally, TOPSIS technique was used as a mechanism for complete rating. Results show that Lebanon has best performance and Kyrgyzstan had weakest performance from different combinations of inputs and outputs. The notable result is Iran has the poor performance and among the 14 studied countries ranks thirteenth.

Keywords: ***Data Envelopment Analysis, Relative Performance, Research and Development, TOPSIS.***

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The Impact of Social Capital on Buyer- supplier Relationships in Manufacturing Companies (Case Study: Qazvin Province Companies)

Safar Fazli [1], Mohsen Hooshangi [2]

Abstract: The main objective of this paper is investigating the impact of social capital on buyer-supplier relationship and buyer performance. Hypotheses test by using of partial least squares technique with a sample of 113 purchasing managers. The results show that relational and structural dimensions have positive impact on buyer-supplier relationship, which lead to increased buyer satisfaction and performance. But cognitive dimension hasn't positive impact on buyer satisfaction. Among the relational dimension factors, trust, dependence and commitment, and among the structural dimension factors, the network ties, supplier evaluation and supplier development have a significant impact on the buyer satisfaction, while none of the cognitive dimension factors have significant positive impact on the buyer satisfaction. Finally, buyer satisfaction from relationship with supplier has a positive impact on buyer performance. The result of this study leads supply chain managers to correct understanding of the impact of social capital on buyer- supplier relationship in order to improve this relationship and performance.

Keywords: ***Buyer's Performance, Buyer's Satisfaction, Buyer-supplier Relationship, Social Capital.***

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An Exact Method for Solving Reliability Redundancy Allocation Problem of K-out-of-n Systems with a Choice of Redundancy Strategy

Seyed Mahmoud Ghazi Mirsaeed [1], Amir Abbas Najafi [2], Hamid Shahriari [3]

Abstract: One of the most important problems in the system reliability optimization is redundancy allocation problem, studied in different system configurations. K-out-of-n structure is a general system configuration and offers enhanced capabilities for analyzing more design problems. Hence, in this paper, the redundancy allocation problem of k-out-of-n systems is studied. In the most previous researches, a predetermined redundancy strategy is assumed within each subsystem. However, in practice, the choice of redundancy strategy provides more improvement in system reliability. Thus, the choice of redundancy strategies is considered as decision variables. First, the problem is mathematically modeled. Then, to overcome the structural complexity of the model, we develop a new linear mathematical formulation to solve the problem with integer programming methods. The proposed algorithm is tested on a well-known test problem that extracted from previous researches. Results show the effectiveness of the proposed algorithm.

Keywords: ***Choice of Redundancy Strategies, Integer Programming, K-out-of-n Systems, Redundancy Allocation Problem.***

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Modeling Job Performance Using Optimized Adaptive Neuro-Fuzzy Inference System

Mahmoud Moradi [1], Behnaz Zanjani [2], Ali Jamali [3]

Abstract: Using current employee performance data to predict the future behavior of the applicants is an interesting area which can broaden new horizons of knowledge lay in the organization**.** Because of inherent ambiguity and uncertainty, cognitive limitations of the human mind make unknown behaviors of very complex systems difficult to predict. As a consequence, it is necessary to model the imprecise modes of reasoning to make rational decisions in an environment of uncertainty and imprecision. In this paper, artificial intelligence and advanced algorithms is introduced as an Adaptive Neuro-Fuzzy Inference Optimized System in order to model the job performance. The correlation coefficient is 0.9956 which indicates high accuracy of extracted model, minimum error and maximum adaptability to predict job performance with actual performance. This approach provides an effective tool for managers in order to avoid subjective judgment errors inherent in human decision making.

Keywords: ***Adaptive Neuro-Fuzzy Inference Optimized System, Job Performance, Modeling, Optimizing, Predicting.***

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Development of a New Pro-rata Warranty Policy for Estimating Costs

Mahdi Nasrollahi [1], Ezzatollahe Asgharizadeh [2], Ahmad Jafarnezhad [3], Mohammad Ali Saniee Monfared [4]

Abstract: In today's fiercely competitive products market, product warranty has started playing an important role. Currently, a large number of products are being sold with warranty policies in the form of free replacement warranty, pro-rata warranty and combined warranty policies. Pro-rata warranties are relatively a complex concept. The modeling of failures during the warranty period and the costs for such policies are complex since the rectification costs are random variables and inflation and deflation rates effect on these costs. This paper focuses on developing a new Pro-rata warranty policy and models for predicting failures and estimating costs for this policy.

Keywords: ***Inflation, Pro-rata Warranty, Warranty, Warranty Cost, Warranty Policies.***

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A Mathematical Model for Supplier Selection and Order Allocation in a Supply Chain Considering Uncertainty in Design Variables

Majid Hooshmandi Maher [1], Maghsoud Amiri [2], La'ya Olfat [3]

Abstract: In most industries, the cost of raw materials and component parts constitutes up to 80% cost of a product. In this situation, proper sourcing, can play a key role in an organization's efficiency and effectiveness. In this paper, determining the optimal order quantity in multi supplier, multi product during several periods, in presence of incremental discounts, and considering multi objective and multi criteria nature of the problem, considering uncertainty in design variables is considered. To incorporate the effective criteria in mathematical model, analytic network process approach is used. After developing the multi objective mixed integer programming, a numerical example is presented. Uncertainty is considered in design variables and the problem is solved by using genetic algorithm. In the mentioned model, problem is solved respect to robustness of design variables such that, a drastic change in these variables leads to the least possible effect on objective value. Ultimately fluctuations decrease as a result of uncertainty management. Finally, results and suggestions for future studies are presented.

Keywords: ***Genetic Algorithm, Multi Objective Mixed Integer Programming, ANP, Decision Making Trial and Evaluation Laboratory.***

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Group Ranking of Bank Units According to Data Envelopment Analysis Approach

Mansoor Momeni [1], Mohsen Rostamy Malkhalifeh [2], Seyed Mostafa Razavi [3], Keikhosro Yakideh [4]

Abstract: Efficiency calculations for units belonging to one group according to data envelopment analysis widely have received attention; while experiences related to efficiency comparison of several groups consisted of decision making units is restricted. Kao's parallel system network DEA model that has been designated aimed at such a comparison, practically leads to accomplish comparison among units instead of groups. This paper presents a new version of kao's model to consider groups' generality, accordance with aim of comparison, while possibility of calculating inefficiency of internal units is still provided. This version due to calculating bigger amounts of efficiency is more eligible to allocate efficiency of one to several groups. For this reason a ranking method of efficient groups is presented to support proposed model. Proposed models included in new version of kao's model and ranking efficient groups model were applied on data provided about supervisory sections of a bank.

Keywords: ***Data Envelopment Analysis, Efficient Groups, Group Ranking, Network DEA, Parallel Systems Efficiency.***

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