and hard intelligent models over hard intelligent models and hard classic models respectively.

Key Words: Time series forecasting, crude steel consumption, feature selection, computational intelligence tools, soft computing.

SYNC-MIXED: A NEW REDUNDANCY STRATEGY FOR RELIABILITY OPTIMIZATION PROBLEM

A. Peiravi
saber.4473@yahoo.com
M. Karbasian(corresponding author)
mkarbasi@mut_es.ac.ir
Dept. of Industrial Engineering
Malek-e-Ashtar University of Technology
M. Abouei Ardakan
abouei@khu.ac.ir
Dept. of Industrial Engineering
Kharazmi University, Tehran
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Abstract

System reliability optimization is one of practical issue in design and engineering. Adding parallel redundant component is a common approach in order to improve the reliability of a specific system. This approach that is known as redundancy allocation problem (RAP), includes discrete component choices with known characteristics such as reliability, cost, weight in order to maximize system reliability. In RAPs, redundancy strategy plays a significant role in increasing reliability of a system or subsystem. Generally, there are three types of redundancy strategies, namely, active, standby and mixed. The latter is a new strategy which is a combination of the two former and have had some noticeable results. This paper presents a new redundancy strategy for system reliability optimization which is called Sync-Mixed. The proposed strategy is a general form of a recently introduced strategy called "Mixed Strategy" that effort to decrease number of switching system usages. In order to evaluate the efficiency of the Sync-Mixed strategy with regarding complexity of formulas for new strategy, a single specific subsystem with five components will be used and reliability of the subsystem will be computed by considering all three previous strategies and the new one. In previous studies, some well-known benchmark problems, including series system, series-parallel system, parallel-series system, and complex system, have been taken into account. The performances of all strategies are compared by considering different values of switching and components reliabilities. In RAP, it is assumed that the switch reliability and components reliability are predetermined parameters. However, in this study different combinations of components reliability and switching system reliability are taken into consideration. The main objective is to evaluate the performance of the new strategy compared to traditional strategies in different situations. Obviously, the subsystem reliability has a direct relationship with the components reliability, switch reliability and type of redundancy strategy. This study is an attempt to shed light on the sensitivity of subsystem reliability as a result of switch and component reliability changes in all redundancy strategies.

Key Words: Reliability optimization, redundancy allocation problem, Sync-Mixed redundancy strategy, choice of strategy.

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Abstract

Human communities long after the use of natural resources on the planet, parts of it unusable and waste disposal underneath. This did not create a serious problem for them and their environment, because the number and distribution of people on the ratio of the area of the planet Earth was very low, however, due to increase in number, population distribution, followed by new developments in content and the quality of materials used, production and waste disposal dilemma of how to involve life and human societies, especially cities have been significant.Iran and world population growth and the increasing amount of waste from one side On the other hand the lack of resources and energy and waste management techniques will be given. But solid waste management is not possible without the cooperation of all segments of society.

Today, the need to improve the physical and social participation of citizens in cities is evident to every one.The experience of different countries in the management of cities shows that cities are properly managed in many cases the government is out of power. Success in this regard depends on public participation and local institutions, and only to gain public confidence and encourage people in different stages of public consultation will lead to a largely in urban management and goal setting functionality is synchronized successfully and finally be able to rely on hard data, and relying on popular support, help ensure their success.

This study, using the combination of factors affecting the production of waste and citizen participation, within the framework of dynamic systems approach (software Vensim), Municipal solid waste and the impact of factors affecting the production model for citizen participation are provided. A total of 400 questionnaires throughout the city due to land area, population and population density were distributed and analysis. It was found from the results of public participation in association with different programs of municipal solid waste management system is increased, the success of these programs is possible to further increase the efficiency and effectiveness of the system (reducing waste production, reducing the rate of landfills).

Key Words: Solid waste management, urban development, dynamic system, the capacity of the landfill, public participation.

APPLICATION OF COMPUTATIONAL INTELLIGENCE TOOLS IN IRAN'S STEEL CONSUMPTION PREDICTION

Sh. Torbat
S.Torbat@in.iut.ac.ir
M. Khashei(corresponding author)
Khashei@cc.iut.ac.ir
M. Bijari
bijari@cc.iut.ac.ir
Dept. of Industrial Engineering
Isfahan University of Technology
DOI:10.24200/J65.2019.7102.1705

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Abstract

Decision-making as one of the principles of management is considered an important factor in prosperity of the organizations. This is so important that managers use efficient tools to improve the quality of their decisions. Steel industry is one of the major industries in this country; consequently, it deserves special attention. In this paper, the main aim is to use scientific methods to manage crude steel consumption in the country. However, the literature shows that it is relatively difficult to yield accurate results in the prediction of consumption, especially in long-term horizon. Researchers believe that high level of complexity and uncertainty in financial markets is main reason of this matter. Therefore, in this paper, a hybrid of intelligent and soft computing models have been used as an effective way in order to model the complexities and uncertainties simultaneously in the data. In this way, the list of variables is recognized based on the literature and expert opinions. Then the linear and nonlinear relationships and also correlations between variables are evaluated and final explanatory variables specified. Finally, four models including hard classic, soft classic, hard intelligent and soft intelligent are designed to predict steel consumption in both short and long term horizons and their results are compared with each other. Empirical results indicate that using the hard intelligent model makes improvement 22.68% and 41.41% in comparison with hard classic model in short and long term horizons respectively in Root Mean Squared Error (RMSE). In addition, the soft intelligent model makes improvement 43.01% and 92.72% in comparison with soft classic model and hard classic model respectively in short term horizon and 34.68% and 91.53% in long term horizon. Results of the study indicate superiority of the soft intelligent models over hard intelligent models and superiority of hard intelligent models over hard classic models. Results of the study indicate superiority of the soft intelligent models

customers originally assigned to that hub, are either reassigned to other operational hubs or they do not receive service for which a penalty must be paid. The problem has been modeled as a two-stage stochastic program in which the decisions on hub locations are made in the first phase. In second phase when disruption scenario has occurred, the allocation of non-hub nodes to hubs takes place in second phase with regard to the operational hubs. A hybrid metaheuristic algorithm based on the adaptive large neighborhood search (ALNS) and simulated annealing (SA) is proposed for solving it. Extensive computational experiments based on the CAB and TR data sets are conducted. Results show the high efficiency of the proposed solution method.

Key Words: Hub location, disruption, adaptive large neighborhood search (ALNS), simulated annealing (SA).

PRICING AND WARRANTY PERIOD DECISIONS FOR SUBSTITUTABLE PRODUCTS UNDER COOPERATIVE AND NON-COOPERATIVE STRATEGIES

M. Taghipour
farzad_tg@yahoo.com
Dept. of Industrial Engineering
South Tehran Branch, Islamic Azad University
A.A. Taleizadeh(corresponding author)
taleizadeh@ut.ac.ir
Dept. of Industrial Engineerng
College of Engineering
University of Tehran
DOI:10.24200/J65.2019.7180.1737

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Abstract

In today's market, price is considered as a determining factor for a company's survival and productivity. Manufacturers and retailers try to lure customers and increase sales by cutting prices. In addition to the price factor, also many companies try to form a reliable brand, with the aim of improving services, warranty and enhancing the quality. In this paper, pricing decisions for two substitutable products in a supply chain with a common retailer and two competitive manufacturers are considered. Orders of the common retailer are two substitutable products from the two manufacturers who sell their products with warranty in the market. Moreover, product warranty affects the retailer's orders such that lower product price and longer warranty period, will encourage the retailer to buy more goods. The retailer sets the market price and the two manufacturers set the wholesale prices for the retailer. Manufacturers must price their products based on their cost structure, and react to effort of competitors to earn a maximum profit. In addition, the pricing strategy of manufacturers should never be a pointless price war, but rational corrective measures taken under competitive circumstances. The aim of this paper is to analyze the effects of different competitive strategies, different power structures of channel members, and the effects of a warranty period on desired pricing decisions. For this purpose, five decentralized games such as cooperation/non-cooperation of manufacturers with different powers, Nash and Stackelberg games are created. Different forms of balanced decision-making are identified. Through comparison and systematic analysis, some of interesting and valuable management insights along with the effects of different decision-making strategies on manufacturers and market power are studied in various models. We find out that, by being the leader, retailer earns higher profits. Also, all members of the network, particularly consumers, are looking for lower retail prices, longer warranty period and greater profits. Therefore, cooperation of the manufacturers is required.

Key Words: Pricing, warranty period decisions, substitutable products, game theory.

A SYSTEM DYNAMICS MODELING APPROACH TO EVALUATION PUBLIC PARTICIPATION IN THE MANAGEMENT OF MUNICIPAL SOLID WASTE

Y. Zare Mehrjerdi(corresponding author)
yzare@yazd.ac.ir
Dept. of Industrial Engineering
University of Yazd
M. Faramarzinejad
faramarzi.mohadese@yahoo.com
Faculty of Industrial Engineering
University of Science and Art, Yazd
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electrical panel (cascading failure), thus creating two types of dependent failures in the system. Using the proposed method, the reliability of such systems is evaluated.

Key Words: Common cause failure, cascading failure, multi state, dynamic fault tree, dynamic bayesian networ.

EVALUATING THE SUPPLIERS BASED ON A HYBRID APPROACH OF EINSTEIN CHOQUET INTEGRAL AND PROMETHEE II WITH RESPECT TO SCOR METRICS (CASE STUDY: MEDICAL LABORATORY EQUIPMENT SUPPLIERS)

M. Kolagar Daronkola
miladkolagar@gmail.com
S.M.H. Hosseini(corresponding author)
sh.hosseini@shahroodut.ac.ir
Dept. of Industrial Engineering and Management
Shahrood University of Technology
DOI:10.24200/J65.2019.7229.1768

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Abstract

Supplier evaluation is one of the most important activities in supply chain management which can effectively contribute to the organizational performance. In the same vein, evaluating the suppliers of healthcare services has great significance. This study aims to develop an approach for evaluating the suppliers of medical laboratory equipment based on the performance attributes of supply chain operations reference (SCOR) model by considering their performance in delivery, cost, and quality dimensions. The required data for this research has been collected by interviewing the professionals and distributing questionnaires among the medical laboratory experts working at the hospitals in district 12 of Tehran. In order to simulate the fuzzy mechanisms of human thinking, a group decision-making model has been developed by using the triangular intuitionistic fuzzy numbers and the experts' opinions have been aggregated and analyzed by utilizing a combination of performance ranking organization method for enrichment evaluation (PROMETHEE) II method and fuzzy Einstein Choquet Integral geometric operator. Also, by comparing the results obtained from the proposed approach with the results obtained from the simple PROMETHEE II method, the high accuracy of this approach has been confirmed.

Key Words: SCOR, Einstein operator, PROMETHEE II, triangular intuitionistic fuzzy numbers, choquet integral.

SINGLE ALLOCATION HUB LOCATION PROBLEM UNDER HUB FAILURE POSSIBILITY: MODELING AND A SOLUTION ALGORITHM

F. Momayezi
farid.momayezi@modares.ac.ir
S. K. Chaharsooghi(corresponding author)
skch@modares.ac.ir
M.M. Sepehri
mehdi.sepehri@gmail.com
A. H.Kashan
a.kashan@modares.ac.ir
Dept. of Industrial and Systems Engineering
Tarbiat Modares University
DOI:10.24200/J65.2019.7201.1746

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Abstract

The hub location problem (HLP) is one of the most important and widely used issues in telecommunication and transportation (freight and passenger) network design. Hub location problem deals with locating the hub facilities in the network and determine the pattern based on the non-hub nodes assignment to each hub so that a specific objective function is optimized. Hubs are intermediate facilities that perform a set of tasks such as consolidation, break-bulk, sorting, etc. In other words, the traffic flows (cargo, passengers, or data) in the network rather than being sent directly from their origins to their destinations, are routed via these intermediate facilities. Established hubs in these networks can be disrupted because of events and natural disasters or deliberate disturbances during their use and in such a case an enormous cost is imposed on the operating companies. Therefore, it is crucial to have a suitable plan for reducing destructive effects of disrupted hubs in the network. In this study, an uncapacitated single allocation hub location problem under hub disruption is considered. It is assumed that every open hub in the network can fail and become unavailable after installation, in which case, the

Abstract

In today's world, the ultimate goal of many businesses is to reduce costs. Also, finding efficient ways to achieve the best results is important to make correct managerial decision. In supply chain system, minimizing costs due to the nature of the deterioration of certain products is concerned and also, finding ways to obtain optimum conditions is essential. The two-level supply chain system with suppliers, distributors and retailers was investigated in this research. Decision variables of this problem due to minimizing costs, are determining of the appropriate initial weight for packaging of deteriorating products and determining of appropriate inventory levels in multi-level supply chain. The Intended product is gradual deteriorating package that is produced and sent by the supplier with a value greater than unit. Shortages for the backlog and also lost sales have been considered. This study is based on a case study of detergent company data. In this study, through simulations to study the behavior of decision variables are discussed. Customers refer to retailers to provide their needs. Customer entrance rate is defined probability Poisson. Based on the considered (S-1,S) ordering policy caries out two operations as soon as entering a retail client. The first one is to order product to distributor and the other is to provide customer needs. Neighbor search method and ARENA software sub-program is used to find optimal points. Then using flexibility of ARENA software, study of cases that are very complex through mathematical modeling and increasing the amount of system uncertainty have been possible. The effect of the implementation period and the number of occurrences that led to the introduction of the points by choosing them can be trusted to extract the results. Using the duration and number of occurrences obtained optimum levels for retailers and distributors, and the surplus was calculated by neighbor search method. At last, the minimum cost for unit product and the extra amount required for a product are calculated by taking into account certain assumptions.

Key Words: Simulation, multi-echelon supplychain, deteriorating items, shortage, customer loyalty.

EVALUATION RELIABILITY OF MULTI STATE REPAIRABLE SYSTEMS BY CONSIDERING COMMON CAUSE FAILURE AND CASCADING FAILURE USING DYNAMIC FAULT TREE AND DYNAMIC BAYESIAN NETWORK

S.M. Mortazavi(corresponding author)
seyedmohammadmortazavi@ymail.com
Dept. of Industrial Engineering
Najafabad Branch, Islamic Azad University
M. Karbasian
mkarbasi@mut-es.ac.ir
Dept. of Industrial Engineering
Malek Ashtar University of Technology
DOI:10.24200/J65.2019.7176.1736

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Abstract

Accurate evaluation of system reliability has always occupied the attention of system engineers and designers. In this connection, taking account of real system features in reliability evaluation models leads to an accurate estimation of reliability. These features include multi state components, repair, dependent failures, and time. The relationship among components in a system causes the failure of one component to affect others; therefore, components fail due not only to independent failure, but also to dependent failure. There are various dependent failures, the most important of which include common cause failure and cascading failure. Common cause failure has been investigated by a number of studies but a few attention has been paid to cascading failures. Cascading failure, severely influences system reliability, such that the defective functioning of one component in some systems is propagated to other components and vice versa. The present paper develops a new method using dynamic bayesian networks to take into consideration two types of dependent failures in the reliability evaluation of systems with repairable multistate components. In so doing, a dynamic fault tree is used and converted into a dynamic Bayesian network, in such a way that repair is incorporated into reliability evaluation by drawing the conditional probability table for a multistate component. Afterwards, by adding a new gate (cascading gate) to the dynamic fault tree and converting it to the dynamic Bayesian network, the impact of cascading failure on multistate systems is examined. Finally, using the common cause failure gate as well as cascading gate, the procedure of evaluation of reliability of a system with two types of dependent failures as well as repairable multistate components is investigated. Else, use of dynamic fault tree and its conversion into a dynamic Bayesian network minimizes the explosion state in the Bayesian network. The sensitivity of the proposed method is analyzed by evaluating the reliability of the high pressure water pumping system. This pumping system uses two water pumps in parallel, which are subject to common cause failure as well as independent failure. The defective functioning of water pumps in turn impinges upon

cost be minimized. In the other hand, the time solution is very important to obtain an acceptable solution in a reasonable time. We present a heuristic approach based on genetic algorithm and exact method to solve the proposed MIP model. The locations of fixed and mobile facility are computed through genetic algorithm then other variables are calculated by solve model with CPLEX. In order to validate the proposed approach, we generate 8 examples with different sizes and numerical results are presented. Also the results of comparison our approach with exact and metaheurisitc method are presente.

Key Words: Blood supply chain, crisis management, stochastic programming, chance constraint, location-allocation, genetic algorithm.

PRESENTING A BI-OBJECTIVE MODEL FOR DESIGNING A DISTRIBUTION NETWORK IN A THREE-LEVEL SUPPLY CHAIN WITH CONSIDERING INFLATION IN A FUZZY ENVIRONMENT

R. Gheibat Khajeh
r.gheibatkhajeh@gmail.com
A. Kazemi(corresponding author)
abkaazemi@gmail.com
Dept. of Industrial and Mechanical Engineering
Qazvin Branch, Islamic Azad University
DOI:10.24200/J65.2019.6952.1625

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Abstract
To strengthen management of supply chain and increase its efficiency, how to step up the research on supply chain distribution network system has become a major topic on logistics. As traditional logistics can no longer suit the requirements for great circulation due to a waste of resources, it is necessary for us to establish distribution systems with network structure, which are composed of some nodes and lines, whose activities serve as a foundation of supply chain distribution system activity. Supply chains cover everything from production, to product development, to the information systems needed to direct these undertakings. One of the important loops supply chain is distribution network. Design and analysis of the distribution network is one of the most important issues facing the distribution companies. The importance of this issue from the fact that logistics costs is in the main line items cost of sales and distribution companies. In recent years, the main problem in the design of the distribution network, minimizing of all the costs associated with it which includes the cost of production, transportation, storage of inventory, and too locating of distribution centers and routing sending products between the loops of supply chain. This study develops a mixed integer nonlinear programming (MINLP) model to design a supply chain. In this paper a bi-objective model for a distribution network in a three-echelon supply chain of multi-product multi-period is considered. The network is consist of manufacturing plants, distribution centers and customer. In this model, some factors including of climate situation on distribution network in form of the concept of reliability is investigated. In addition, in this study, with considering some costs as fuzzy and studying the effect of inflation on costs of distribution centers, is tried the proposed model is closer to real-world problems. Since this model has high complexity, so for solving this model, is used a meta-heuristic method such as Genetic algorithm. Finally the obtained results is analyzed.

Key Words: Distribution network, supply chain, reliability, inflation, genetic algorithm.

SIMULATION OF MULTI-ECHELON SUPPLY CHAIN FOR DETERIORATING ITEMS CONSIDERING EFFECT OF CUSTOMER LOYALTY

SH. Karimi
shirinkarimi@srbiau.ac.ir
S.M. Haji Molana(corresponding author)
molana@srbiau.ac.ir
Dept. of Industrial Engineering
Islamic Azad University
Science and Research Branch
S.M. Sajadi
msajadi@ut.ac.ir
Faculty of Entrepreneurship
University of Tehran
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AUCTION USING GENETIC ALGORITHM AND DANTZIG-WOLFE DECOMPOSITION

R. Alaei
ralaei@mail.kntu.ac.ir
M. Setak(corresponding author)
setak@kntu.ac.ir
Dept. of Industrial Engineering
K.N. Toosi University of Technology
DOI:10.24200/J65.2019.7078.1688

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Abstract

In this paper, the problem of winner determination in a combinatorial reverse auction mechanism is considered for solving. Because of NP-completeness of finding a feasible solution for the formulated winner determination problem as well as its solving, the popular exact methods are failed in solving its large-scale instances. So, an exact problem-specific two-stage method is proposed to reduce the time required for its solving. The proposed method involves a well-known population-based metaheuristic called genetic algorithm and an advanced exact method called Dantzig-Wolfe decomposition in first and second stages, respectively. The genetic algorithm is used for finding a near-optimal feasible solution for the formulated winner determination problem as an initial solution for the second stage. The proposed genetic algorithm generates feasible solutions in initial population and repairs infeasible child solutions after reproduction using problem-specific operators. Also, Dantzig-Wolfe decomposition is used for decomposing the formulated winner determination problem with block-diagonal structure in its constraints matrix to a master problem and multiple sub-problems for finding its optimal solution within a reasonable time starting from the near-optimal feasible solution found by genetic algorithm in first stage. We conducted a computational experiment using randomly generated instances of winner determination problem with different sizes to evaluate the performance of our proposed two-stage method in solving the formulated winner determination problem. Computational results demonstrate that the genetic algorithm performs well in finding near-optimal solutions of the formulated problem. Also, the computational results show that the Dantzig-Wolfe decomposition based method in second stage can improve the near-optimal solution found by genetic algorithm in first stage and find the optimal solution of formulated winner determination problem as well as confirming the optimality or non-optimality of solution found by genetic algorithm. The other result is that the proposed two-stage method spends less time compared with LINGO software in finding optimal solution of formulated winner determination problem.

Key Words: Supplier selection, combinatorial reverse auction, winner determination problem, genetic algorithm, dantzig-wolfe decomposition.

A FOUR-ECHELON TWO-STAGE STOCHASTIC MODEL FOR BLOOD PRODUCTS SUPPLY IN DISASTERS

M.B. Fakhrzad(corresponding author)
mfakhrzad@yazd.ac.ir
E. Ghasemi
eghasemi@stu.yazd.ac.ir
Dept. of Industrial Engineering
Yazd University
DOI:10.24200/J65.2019.7024.1681

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Abstract

In recent years, the location of mobile facilities has been highly regarded in design of health system. One of the important areas in this field is design of blood collection and distribution systems. Since blood is as perishable and vital goods and donation of blood is a voluntary work, supply blood and blood products is one of the most challenging issues in the supply chain in emergency and non-emergency situation. In this paper, we propose a four-echelon two-stage stochastic model to supply whole blood and its products in disaster. The hospitals, regional blood centers, local blood centers and bloodmobile facilities are considered as main elements of blood supply chain. It is assumed that the blood collection from the donors just done in bloodmobile facilities and local blood centers. Also, processing operation of blood products from collected whole blood are done only in the regional blood centers. In the designed supply network in this paper, every hospital could provide needed blood products from other near hospitals in the emergency situation as well as other fixed and mobile blood centers. One of the most important issues in the blood supply in disasters is delivery time of blood, so here; we consider an upper bound to blood delivery time to the affected areas and the objective of our presented model is blood supply in the standard time so that the total supply

eration the possibility of competition and interruption in servicing availability. The objective functions are of cost minimization and facility attraction maximization. The cost components are facility construction cost, the routes' enhancement, improvement and or development expenses, and transportation costs. Due to the facts that customers' demands as well as transportation expenses are uncertain authors have employed robust type modeling of the problem taking scenario approach into consideration. We also have taken into considered the concept of reliable network design and attraction function for facility location in the competition environment. In order to show the application of the proposed model, a real case study discussing the facility location design and facility implementation for a new CT-Scan system in Fars province was studied. The result of this study indicates that Fars providence has capacity for four CT-Scans that can be positioned in the cities of Fasa, Marvedasht, Estahban and Shiraz. For sensitivity analysis purposes, two parameters are considered separately and simultaneously. Parameter can have impacts on the cost objective function and hence on the final solution of the problem. The aim of this research is obtaining an answer that is less sensitive to the changes in data and meantime increases the system's reliability. A tradeoff between the solution robustness and model robustness for various values of parameter is demonstrated by the figure in the body of the article. This tradeoff can help the decision makers in determining suitable weight for Due to the fact that when the number of scenarios increases the use of exact methods of solutions are impossible for the reason of being an Np-hard problem one needs to employ a meta-heuristic approach to solve this problem. This can be considered as a future research for those who want to work on the extension of this problem.

Key Words: Facility location, network design, robust optimization, reliability, competitive facilities, uncertain environment.

DEVELOPING A BI-OBJECTIVE MODEL FOR BLOOD SUPPLY CHAIN NETWORK DESIGN CONSIDERING QUEUING THEORY IN DISASTERS

F. Bayatloo
fatemeh.bayatloo@ut.ac.ir
A. Bozorgi-Amiri(corresponding author)
alibozorgi@ut.ac.ir
A. Yousefi-Babadi
a.yousefiabadi@ut.ac.ir
Dept. of Industrial Engineering
University of Tehran

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Abstract

Natural disasters cause to make a vast amount of relief items demand in affected areas. Reducing the waiting time of injured people for emergency supplies is one of the main issues in post-disaster emergency response. Blood is one of these items, which has a vital role in preserving affected people's life. Therefore, in post-disaster situation, creating a queue of injured people in order to receive blood services in hospitals is expected. Thus, designing a supply chain network that considers waiting time for blood supply while minimizing total cost is a challenging problem. In this paper, a bi-objective mixed integer nonlinear-programming model is proposed, which uses queuing theory to incorporate more realistic waiting time. This supply chain consists of five echelons: donors, blood collection facilities (permanently and temporary), blood center, demand points (hospitals), and injured people. Location-allocation, inventory level, blood shortage in some echelons, flow of blood in the network and waiting time are related decisions that are optimized in this model. With respect to variation in some parameters such as demand, a multi-period context is more effective to cope with these variations. In order to better manage blood collection, temporary blood facilities can move in a set of candidate points at the beginning of each period. Moreover, multiple allocations of donors to capacitated blood collection facilities and blood center are allowed by considering the covering radius of facilities. Finally, the performance of the proposed model is investigated by a practical numerical example. Moreover, several sensitively analyses are conducted. According to the model results, optimized allocation of injured people to hospitals and servers leads to reduction of queue length as well as waiting time. This improvement will be considerable when the intensity of disaster is high and a large number of injured people are transported to hospitals. Furthermore, the effectiveness of shortage cost and service time on objective functions is explored in the sensitivity analysis section.

Key Words: Blood supply chain, bi-objective optimization, disaster, queuing theory, multiple allocations.

WINNER DETERMINATION IN COMBINATORIAL REVERSE

the product and then calculate the amount of extra utility (EU) and synergy. Finally calculate the value of the coalition this game via methods such as the Tau value, Shapley and core center. For a better understanding of the mentioned model, an example of three manufacturing companies is presented that use similar resources in producing and share them with others in order to reduce costs and divide the profits.

Key Words: Resources leveling, available resources, shapely value, least core, multi owner processes, cooperative game theory.

A GAME THEORETIC APPROACH FOR PRICING OF COMPLEMENTARY PRODUCTS AND DETERMINATION OF INVESTMENT AMOUNT WITH TWO MANUFACTURERS

L. Shahbazi
layashahbazy@gmail.com
M. Rasti-Barzoki(corresponding author)
rasti@cc.iut.ac.ir
Dept. of Industrial and Systems Engineering
Isfahan University of Technology
DOI:10.24200/J65.2019.7068.1684

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Abstract

This article deals with an important topic which is recognized widely in the industrial issues, and investigates a game theory problem in investment games. The problem considers a market with an investor and two manufacturers which are producing complementary products. These two manufacturers intend to purchase new technology; to use technological advantages. New facilities help them reduce their production costs. Market demand is a linear function of price; that increases due to the market price reduction. The two manufacturers in order to buy the new facilities need to use the capital of an investor. For satisfying the investor to invest his/her finance, manufacturers compete with each other. In many investment games, the investor enters into the market and becomes a market member. But in this game, unlike previous studies, the investor won't enter the market directly. He/she just invest in the firm and gains a definite percent of the investment's profit from manufacturers. During problem-solving, the profit of each agent is maximized separately. The game is considered as a Stackelberg-Bertrand game, and assumed the investor as the leader and the manufacturers as followers. To solve the problem, the investor first determines how much to fund in each firm, and then the manufacturers follow investor's decision, and each firm will determine its own price according to the amount of capital gains separately. It is worth noting that the manufacturers make their decision simultaneously. To solve the game, first by Nash equilibrium, the prices of two manufacturers are obtained. Then, according to the equilibrium prices and by Stackelberg equilibrium, the optimal amount of investment in the first firm, as the decision variable of the investor, will be evaluated. The amount of investing in per firm and new demand and also new market prices after the investment has been calculated afterward. At last some managerial insights are derived.

Key Words: Supply chain, pricing, investment, nash and stackelberg equilibrium, game theory.

A MULTI OBJECTIVE ROBUST OPTIMIZATION MODEL OF FACILITY LOCATION-RELIABLE NETWORK DESIGN IN COMPETITIVE ENVIRONMENT UNDER UNCERTAINTY

Y. Zare Mehrjerdi(corresponding author)
yzare@yazd.ac.ir
M. Heidary Meybodi
heidarymajid89@yahoo.com
Dept. of Industrial Engineering
University of Yazd
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Abstract

In this article, authors propose a mixed integer bi-criterion linear programming model for facility locations-network design problem under uncertainty in the competitive environment. This model takes into consid-

Abstracts of Papers in English

OPTIMIZATION OF COOPERATIVE RESOURCES LEVELING OF MULTI COMPANIES PRODUCING MULTI PRODUCTS VIA GAME THEORY APPROACH

M. Ebrahimzadeh(corresponding author)
marjanebrahimzadeh2015@gmail.com
A. Hafezalkotob
a_hafez@azad.ac.ir
A. Parizadeh
r.parizad@yahoo.com
Dept. of Industrial Engineering
Islamic Azad University, South Tehran Branch
DOI:10.24200/J65.2019.6808.1559

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Abstract

Today we can provide optimization models with game theory in resource leveling issues, given the resources capacity available and the conditions in which players must take strategic decisions in different cases within the coalitions and in the market. Suitable resources leveling is an important issue in all projects. Especially in cases where access to resources simply are not possible, increase the importance of reducing the maximum daily resource and therefore the overall resource requirements. Project managers are needed on a schedule based on the optimal use of the resources in order to complete their projects, always. The aim of project resource leveling, reduce the costs of unnecessary resources available, under certain circumstances, and a timely response to market demand in order to keep the company's strategic position. This is a problem with the players which using cooperative game theory approach to obtain an approximate solution via MATLAB and Lingo. In this paper, the process of multi-owner production of products using various and similar resources is discussed. Players are companies that are interested in produce the products and want to reduce their costs and increase their revenue. In particular, this paper, using Collaborative Game Theory, seeks to answer the question of how process owners can gain the most revenue and the lowest cost while collaborating together, and respond in a timely manner to market demand. So, first, minimize the variance of consumption resources needed to produce