

Data Mining of Students Withdrawal at University of Tehran, Focusing on Fee Paid Students (to Prevent Customer Churn)

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Abstract: Student withdrawal in higher education is one the important challenges in universities. This paper considers the admission of fee paid students as a business and their withdrawals as customer churn. The aim is to investigate the attrition and predicted risk of attrition to adapt interventionist polices deterrent. This study is a descriptive an applicable technique that uses quantitative and qualitative data. It uses Crisp technology of data mining. The data are derived from educational system of University of Tehran including 21420 fee paid students accepted at 2010 to 2014. The main goal is to analyze the behavior that is at risk of attrition and withdrawal. After data analyze and construction of predictive modeling, the probability table of attrition and regression model will be presented. The final results show that the first and second semester (especially the age range 24-31) of M.Sc students are the most likely risk of withdrawal of happening.

Key words: *customer churn, customer relation management, educational data mining, withdrawal.*

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Fraud Detection Using a Fuzzy Expert System in Motor Insurance

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Abstract: Insurance industry experts believe that fraud is a destructive disaster in the insurance industry. Over the years, many methods have been used in the literature for fraud detection, one of which is expert systems. Fraud detection expert systems are based on the knowledge of experts in the field of insurance identifies fraud. Judgment of experts is mostly based on evidence, documents, qualitative information which is often presented in verbal words to describe the fraudulent behavior. In the presented model, 61 qualitative and quantitative criteria related to the detection of fraud in car insurance were identified. Then, these criteria were prioritized according to expert opinion and 17 criteria with the highest priority classified into eight factors were selected. In the suggested system fuzzy inference was performed using Mamdani algorithm. Finally, the designed system was implemented to an Iranian private insurance company and the validity of the system assessed by a questionnaire and came up to 69.45%. The obtained results indicate that the proposed model is able to detect the fraud quite significantly.

Key words: *expert systems, fraud detection, fuzzy Logic, linguistic variables.*

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Combines the Apriori and FCM Algorithm to Improve the Extracted Association Rules with Determine the Minimum Support Automatically

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Abstract: Association rules mining is one of the most popular data mining models. Single minimum support are used in classic association rules mining algorithms, like Apriori, while new approaches tried to promote classic algorithms, like MSapriori, use multiple minimum support. In both cases, the user has to specify the minimum support. Let's say the user wants to apply Apriori algorithm on a database with millions of transactions. They can't possibly have all the necessary knowledge about all the transactions in the database and thus cannot specify the minimum support. In this paper, using fuzzificated data and averaging techniques, we propose a method in which Apriori algorithm would specify the minimum support in a fully automated manner. The simulation results on a real example show that our approach works better than the classic Apriori algorithm.

Key words: *Apriori algorithm, association rules, frequent patterns, support fuzzy clustering.*

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Designing a Decision Support System for Prioritizing of Banks' Branches

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Abstract: The banks are the most important symbol of monetary market in any country without exception. As the optimum function of the banks have important role in economic development of the country, creating the ground for qualitative and quantitative promotion of the banks performance in healthy competition can play important role in achieving the goals. One of the methods helping the bank's branches to identify the competitive position and performance quality is evaluation of their performance from various aspects and their ranking. The aim of present study is to design a decision support system based on Promethee II method as a complete and comprehensive method and by automatic ranking, despite considering the qualitative and quantitative indices, it is done in by low time and costs with high precision. Thus, it is possible to analyze the sensitivities to be sure of the initial selections and changing the indices and values dependent upon the environmental changes are provided for branches evaluators. The system output is the rank associated to each branch based on Promethee II method.

Key words: *Bank branches rating, decision support system, Multi-criteria decision making methods, Performance evaluation, Promethee II method.*

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A Model in Support of the Implementation of Enterprise Resource Planning (ERP) Projects by System Dynamics Approach

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Abstract: Recent studies have indicated that the rate of successful Enterprise Resource Planning (ERP) implementation projects is reduced and risk of implementation is increased to the same extent. Accordingly, this study provides a model in support of ERP implementation using system dynamics approach by behavioral simulation in the Vensim software environment. This study is an applied research and due to the nature, this is a descriptive and analytical research. For the purpose of research, proposed simulation model is used in Paksan organization in order to present policies for the improvement in the organization's ERP system implementation project by testing different strategies in simulation environment. Since in this research the improvement of ERP system implementation project has been considered in terms of time and cost, policies have been proposed to reduce these two factors that their results were this: increasing the number of experienced users, eliminating customization and increasing the amount of training cause improvement in project performance.

Key words: *Enterprise resource planning, modeling, Policy making, System dynamics approach.*

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Survey on the Priority Factors Influencing IT Outsourcing in the Platform of Cloud Computing in Semnan Province Universities by Fuzzy DEMATEL Technique

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Abstract: Today, Information Technology Outsourcing (ITO) has developed and caused organizations to become more flexible and dynamic than they were before. The ever-increasing development of ICT is one of the main reasons for the promotion of outsourcing. That is due to the fact that many organizations are not able to adapt their hardware and software in accordance with the fast-paced technology development. Cloud Computing is considered as one of newest paradigms in ITO. Due to its flexible nature, this paradigm has been able to protect organizations against extreme changes of IT during recent years. Furthermore, by better understanding their needs and prioritizing them, organizations can experience a more successful outsourcing in the context of Cloud Computing. SMI can be a considerable help in identifying organization's needs to use Cloud Computing. This article suggests that organizations use Fuzzy DEMATEL Technique to prioritize their needs. In this research which is conducted as a case study, all the universities in Semnan Province are examined. The results show that the most important criteria for outsourcing in the context of Cloud Computing are Compliance, Operability and Contracting Experience respectively. Moreover, the model has identified Security Management, Ownership and Contracting Experience as the most effective criteria and Learnability, Maintainability and Recoverability as the most affected one.

Key words: *Cloud computing, Fuzzy DEMATEL technique, IT outsourcing, Service measurement index (SMI).*

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Opinion Mining in Persian Language

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Abstract: Rapid growth of networks and social networks results in more access to people's opinion. These opinions contain useful information. By analyzing these opinions, people's preferences and their positive and negative opinions about different subjects can be identified. Opinion mining is the process of analyzing people's emotions, feelings and opinions to identify their preferences. In this article, a method for opinion mining in Persian language is introduced that is a combination of SVM and lexicon as a set of features. The lexicon is created by using SentiWordNet. To assess the algorithm, data of hotel domain is collected. Four cases were defined and among those cases, the case in which frequency of word multiplies with its orientation got the best result. The proposed method performs better compared to other methods in Persian opinion mining.

Key words: *Lexicon, Opinion mining, Orientation, Support vector machine.*

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Designing an Expert System for Analyzing the Energy Consumption Behavior of Employees in Organizations Using Rough Set Theory

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Abstract: Understanding and changing the energy consumption behavior requires extensive knowledge about the motives of behavior. In this research, Rough Set Theory is used to investigate the energy consumption behavior of employees in organizations. So, thirteen condition attributes and a decision attribute are selected and the decision system is created. Condition attributes include demographic, values, attitudes and organizational characteristics of employees and decision attribute relates to energy consumption behavior. 482 employees are selected randomly from 37 office buildings of ministry of Petroleum and rough modeling are performed for them. By combining different methods of discrediting, reduction algorithms and rule generating, nine models are made using ROSETTA software. The results show that four of the 13 condition attributes, involving “organizational citizenship”, “satisfaction”, “attitude toward behavior” and “lighting control” are selected as the main features of the system. After cross validation of the various models, the model of manually discrediting using genetic algorithms and ORR approach to extract reducts has the most accuracy and selected as the most reliable model.

Key words: *energy consumption behavior, ROSETTA, rough set theory, rule induction.*

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Intelligent Online Store: User Behavior Analysis based Recommender System

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Abstract: Recommender systems provide personalised recommendations to users, helping them find their ideal items, also play a key role in encouraging users to make their purchases through websites thus leading to the success of online stores. The collaborative filtering method is one of the most successful techniques utilized in these systems facilitating the provision of recommendations close to that of the customer's taste and need. However the proliferation of both customers and products on offer, the technique faces some issues such as "cold start" and scalability. As such in this paper a new method has been introduced in which user-based collaborative filtering is used at a base method along with a weighted clustering of users based upon demographics in order to improve the results obtained from the system. The implementation of the results of the algorithms demonstrate that the presented approach has a lower RMSE, which means that the system offers improved performance and accuracy and that the resulting recommendations are closer to the taste and preferences of the users.

Key words: *clustering, collaborative filtering, demographics, recommender system.*

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Priority of Mobile Health Applications and its Infrastructures

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Abstract: Developing of mobile technologies in the field of health create a new branch of e-Health called mobile-health. The goal of this study is evaluation of communications infrastructure for mobile-health. For this purpose, fuzzy analytic hierarchy process is used for modeling and ranking the criterions and applications. Three main criteria in mobile communication network namely, data transmission, application services, and the accessing to the network were chosen. Then, sub-criteria of technological infrastructure were classified according to three main criteria using the Delphi and fuzzy Delphi techniques and thirteen applications for mobile-health was added to it as alternatives. The results show that the accessing to the mobile network has the highest weight (0.5656) and priority. The second criterion is data transmission (0.4184) and finally application services in mobile communication networks (0.0159) are the last factor. It has a large gap from other two factors. According to the obtained results, community mobilization, electronic health records of patient and patient monitoring have the highest weight 0.0981, 0.0878 and 0.0876, respectively, and these are the top priorities of mobile-health applications.

Key words: cellular phone, e-readiness assessment, fuzzy *analytical hierarchy process*, mobile health.

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Challenge of Successful KMS Implementation: Exploration of Effective Factors on KM Acceptance via Mixed Method

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Abstract: Regarding strategic importance of KM, achieving to KM objectives is difficult in practice and has faced with challenges. One of the major challenges is reluctance of users in KMS acceptance and use. In this paper in order to exploitation of comprehensive model, effective factors of knowledge initiatives are extracted via mixed method in which systematic literature review along with open coding of grounded theory are applied to enrich extracted factors and identifying native factors. Finally, in order to validating developed model, number of KM experts and specialists are asked to assess the factors and collected data were analyzed with structural equation modeling (SEM). Finally, individual, organizational, competitive and technological/ informational factors are confirmed as external variables on TAM.

Key words: *knowledge management (KM), grounded theory, structural equation modeling, systematic literature review, technology acceptance.*

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Modeling the Innovation Orientation and Market Orientation of Banks Electronic Services Using Hybrid Model of FAHP, FTOPSIS and Possibility Theory

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Abstract: The purpose of this study is to consider and modeling E-Commerce variables based on FAHP, FTOPSIS and Possibility Theory to create a new approach in decision-making techniques. Thus, modeling Market Orientations and Innovation Orientation indicators as the E-Satisfaction factors and Fulfillment & Reliability, Responsiveness and Security indicators as the E-Trust factors is done for selected banks. Data collected from customers and experts via distributing questionnaires and the data were analyzed by FAHP, FTOPSIS and Possibility Theory techniques. The results show that E-Satisfaction, Innovation Orientation and Security are the important indicators in E-Loyalty and Mellat Bank takes the highest rank in covering these indicators.

Key words: *FAHP, FTOPSIS, Innovation orientation, Market orientations, Possibility theory*

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