# Academic These Abstracts

## Proposed Predictive Data Mining Model for Improving Academic Performance Achievement of Higher Education StudentsPh. D. Dissertation

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### ABSTRACT

The study aims to propose a predictive data-mining model for improving the academic performance achievement of higher educational students, by defining and analyzing the requirements of a complete system based on a computer system.That is used to identify the highly influencing predictive factors of the academic performance achievement of higher education students. This study constructs a prediction data-mining model based on identified predictive variables to improve academic performance achievement.  The study measured the impact of studying the decision support systems (DSS) curriculum on the graduation project and measured the students' evaluation of E-learning on the academic performance achievement improvement. The quality report of the study indicates to the decision-maker the areas that need improvement in the direct criteria aspects, which affect the students' academic achievement.It also used data mining functions to analyze and evaluate student academic data that will enhance the quality of the higher educational system, and the higher education managements can use such classification and prediction model to enhance the courses outcome according to the extracted knowledge.

  CRISP-DM model and WEKA as an open sourcedata mining software package are being adopted to choose to build the classification model and to predict the proposed predictive data-mining model. The previous studies indicated that most of these literature used decision tree because decision tree is a very good and practical method since it is relatively fast. This is easily converted to simple classification rules to represent logical rules of student final score and may predict the student final grade.  Additionally the previous studies on this topic indicated that most of the applications uses more than one data mining techniques and compares the results to reach the most accurate technique, which depend on the data type.

 The study uses four techniques (SVM, Neural Network, Decision Tree (ID3, C4.5 &C&RTree algorithms, and Naïve Bayes) to verify the best accurate technique to build the proposed predictive data-mining model. This would help in enhancing the quality of the higher educational system through evaluating student data, studying the main attributes that may affect the student achievement, and predicting the final score in the course under study. Finally, the study exercises the correlation between the course studying and the final project in management information system and accounting departments.

Sixteen criteria variables (one class variable and 15 conditional variables) are divided into indirect aspects, and direct criteria aspects collected through who study decision support systems the course under study. A case study comprising 1000 students'data obtained from the fourth year students enrolled in the academic 2010-2011 is being conducted and collected the data to be used in the proposed application from a private academy (Modern Academy for Computer Science and Information Technology,then the proposed predictive data-mining model experimented to predict 13 students' final scores.

The procedures of the study are summarizedin the following steps:

1. Assemble a collection of data to analyze

2.  Present these data to a data mining tool

3.  Interpret the results

4. Apply the results to a new problem or situation

  Finally, the results of the study showed that, "The variables most influencing the student's achievement are (attendance)" and as such the university administration should be highly concerned with the level of attendance factor and advise the students regularly if they fall behind in their attendance level.

  Also "The decision tree technique gives better prediction accuracy than other techniques" as the indication of the previous studies so the study used decision tree, ID3 algorithm to build both the classification rules, and the proposed predictive data mining modelwhich used to predict the student's final score in decision support systems course.

  Additionally "there is a relationship between the curriculum (decision support systems) and the students' project achievement and finally "Using e-learning to study the decision support systems curriculum will improve the student's achievement".

  All the results indicated the success of the proposed system in the current study in predicting the student final score in the course under study.

Keywords: Data Mining, Academic Performance Achievement, Higher Education, CRISP-DM, WEKA Open Source Software Package, Case Study, DSS Curriculum, Egypt

# A PROPOSED MODEL OF SERVER VIRTUALIZATION AND SERVICE ORIENTED ARCHITECTURE INTEGRATION FOR BUSINESS INFRASTRUCTURE OPTIMIZATION, EFFICIENCY AND COST REDUCTION.

## MSc. Thesis
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## ABSTRACT

Each year, organizations worldwide spend billions of dollars on their information technology (IT) infrastructure. IT systems have become increasingly larger and more complex, thus making it more difficult to build an optimal IT infrastructure in today's rapidly changing business environments. Organizations are under ever-increasing pressure to reduce operational costs while still ensuring that flexibility, service delivery levels, and business efficiency continue to improve. This study provides an overview of the idea of server virtualization and Service Oriented Architecture (SOA) integration as an effective approach. This Approach is intended to offers a proven way to increase equipment utilization, reduce management and administrative costs reduction, improve the availability of services and resources, and provide a flexible infrastructure that can quickly be adapted to the changing needs of the business, which help organizations to face the daily challenges. This is to do more tasks with less: reducing downtime, responding quickly to new initiatives, and increasing the performance, while keeping costs down. The main objective of this study is to develop an integration model of Server Virtualization and Service-Oriented architecture to measure the effectiveness of adopting such model towards infrastructure optimization, business efficiency and cost reduction. This study explores how virtualization technology and SOA are being used to improve resource management, simplify deployment, and increase the resilience of modern data centers. With the promise of shortened development cycles, increased flexibility and greater customer responsiveness, organizations should migrate to this proposed model of server virtualization and service-oriented architecture implementations.

Keywords: Server Virtualization, Service Oriented Architecture, Integration, Business Infrastructure, Business Optimization, Business Efficiency, Cost Reduction, Telecommunications Sector, Survey Method, Simulation, Egypt.

# A META ANALYSIS for ARABIC ARTICLE SPEECH RECOGNITION with the DEVELOPMENT of NOISE FILTER MSc

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## Abstract

In the context of digital processing of speech signal, this thesis aims to:

(1) Show the MSc. and Ph.D. theses that had been conducted and awarded in the field of acoustics processing, in the government's Egyptian universities. This is required to determine the existing map of acoustics, which the Egyptian had been implemented. These studies helped in identifying the topics that have not been studied. Therefore, avoiding repeating the implemented ones. Appendixes A in this thesis included 153 thesis that had been collected in this area, including the brief commentary for each thesis.

(2) The thesis applied developing algorithms utilizing C programming language and using frame duration 20ms, as well as develop Moving Average Filter in the time domain to reduce the proportion of mixed noises with spoken words, and to determine the impact of the filter on the process of automatic speech recognition and the process of human listening, conducted the following:

( i ) Identifying the impact of the filter on automatic speech recognition. An automatic system was built to distinguish the Arabic numerals (from "صفر" to "تسعة") that was pronouncedfive timesfromonespeaker,and every wordisstoredin thecomputerinaseparatefileand mixing every word with every kind of seven noise types. Then applying filter on noised words to give filtered words and extractingdistinctive featuresofeachtypeofthethreetypesofwords (reference, noised, filtered) using ZCR and Autocorrelation, Separately, and using ED as a classifier including the use of DTW Then extract discriminationratiosforthethreetypesofwords andconducta comparisonbetweenthethreeratios.

( ii ) Regarding theimpacton human listening, 66 Arabic wordswerec hoseincludedlinguisticrules,thataffect theprocessofhumanlistening pronounced from five speakers (3 male, 2 female) different agesandsizessomatic and every wordisstoredin thecomputerinaseparatefileand mixing every word with every kind of seven noise types then applying filter on noised words to give filtered words Then measure the impact of the filter on improve the listening process through two measures:

First: The arithmetical measuring to know the rate of filtration (Reduce the noise proportion from the word) by extractingdistinctive featuresofeachtype ofthethreetypesofwords by using ZCR and Autocorrelation, Separately, and using EDTo measure the distance between each of the (reference word, noised) and (reference word, filtered) Then compare thesedifferences.

Secondly: Listening evaluation by using MOS methodology by hearing the three types of words to each speaker of the five speakers and give grades for three types of criteria through two listeners (man, woman).