Volume 17, Number 1 ISSN 1948-3171

Allied Academies
International Conference

New Orleans, Louisiana
March 27-30, 2013

Academy of Information and Management Sciences

PROCEEDINGS

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CLOUD COMPUTING EFFECTS' ON SMALL BUSINESS

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ABSTRACT

Cloud Computing is a process of delivering services available in a host computer over the Internet. Cloud service has distinctive characteristics that can differentiate it from the traditional hosting. It is available on demand and services are managed by the provider. Cloud computing offers a cost-effective alternative through improved utilization and reduced administration and infrastructure. Small businesses can benefit from cloud computing by implementing and managing their information systems using this tool. The objective of this research project was to study the benefits and drawbacks of cloud computing in terms of cost, data security, and data availability for small businesses. A survey and a data-driven model were developed to collect and analyze data concerning six major research issues. The surveys' distribution methods include face-to-face interviews, website responses, and emails. The result of the data analysis shows that 59% of the small businesses using cloud computing were satisfied with the level of cloud security. Also 34% of the small businesses indicated that cloud computing can be considered a reliable information management facility. Further, 55% of the small businesses agreed that cloud computing is cost effective. The results of this study will assist small businesses to decide whether or not cloud computing is feasible for their daily operations.

Keywords: Cloud Computing, IS Security, Small Business Infrastructure and Management

SUPPLY CHAIN PROFIT DIVISION USING SIMULATION

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ABSTRACT

This paper is to apply simulation to divide supply chain profits in a stochastic demand market. The Shapley value is used as the methodology solution to fairly divide profits in a supply chain. Simulation is a tool to get the individual Shapley values of all the supply chain members in the cooperative game. Simulation is a very useful and powerful tool, and modeling by simulation will handle well some complicated cases, including combining two stochastic functions. The work contributes to the study about supply chain profit division by relaxing the assumption of normal demand distributions.

FUTURE TRENDS IN CYBER TERRORISM AND CRIME

Maurice E. Dawson Jr., Alabama A&M University

ABSTRACT

The United States (U.S.) government has formally declared an act of cyber terrorism is an act of war it is imperative that we explore this new form of terrorism and how it can be mitigated to an acceptable risk. Explored in this submission will be indirect and direct attacks on technologies or systems that have wireless functionality. Other items further explored in this study include Personal Unmanned Air Vehicles (PUAVs), Open Source Software (OSS) such as Backtrack Linux, and rending of buildings in simulated environments or areas for terrorist training with tools such as OpenSimulator (OpenSim). This study extends the scope of cyber terrorism and crime by introducing new technological concepts. Methods, Implications, limitations, and conclusions are discussed in this paper.

Keywords: cyber terrorism, cyber infrastructure, trends in crime

OPEN SOURCE TECHNOLOGIES TO ASSIST WITH SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS DEVELOPMENT IN CRITICAL DISCIPLINES

Maurice Dawson Jr., Alabama A&M University

ABSTRACT

This research in progress will explore those OSS technologies and implementations for fields such as cyber security, systems engineering, software development, and Enterprise Architecture (EA). It is necessary to develop students in the disciplines of engineering and computer science as the states is actively working hard to increase Science, Technology, Engineering, and Mathematics (STEM) fields. In the last decade, the United States of America (USA) has created more substantial government commands for cyber security without the appropriate personnel to fill slots. To fill those vacant requisitions a mitigation plan to prepare a generation that has been under represented with the appropriate skillets to meet an ever growing demand. The research will also address the issue of rising costs associated with technologies and specifically address how Open Source Software (OSS) allows these students to maximize their technology learning experience.

Keywords-*Linux, open source, STEM, education, cyber security*

OPTIMAL PRODUCTION POLICY FOR A SYSTEM WITH IMPERFECT QUALITY, REWORK, SCRAP, AND A PERMISSIBLE CREDIT PERIOD

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Tarik Mikdashi, Lebanese American University
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ABSTRACT

The objective of this research is to develop an optimal production policy for a production system that uses a certain type of raw material and whose imperfect quality finished items are reworked or scrapped. It is assumed that the raw material acquired from a supplier contains a percentage of defective items. Screening for defective items of raw material is conducted at the beginning of the production period. The defective items are returned to the supplier who offers a delay in payment for the non-defective items of raw material. The non-defective items are used in the production process. This process is assumed to be imperfect where a percentage of the items produced are either defective or of imperfect quality. A screening process is conducted throughout the production period. The defective items detected are scraped and the imperfect quality items are reworked. A mathematical model is formulated. The optimal production policy is determined. Numerical examples illustrating the model are provided.

FACTORS THAT AFFECT SUCCESSFUL USE OF SMART PHONES IN M-LEARNING ENVIRONMENT

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ABSTRACT

As the capabilities of smart phones and the readiness of universities for M-learning (Mobile-learning) grow, M-learning becomes an increasingly-important research topic. Compared with notebook computers and PDAs, smart phones provide improved mobility and access to learning, regardless of time and location. Drawing upon the Information Systems Success (ISS) model and the body of M-learning research, this study investigates factors that affect the successful use of smart phones in M-learning environments. A structural equation model (SEM) was used to test the proposed model. The model was tested using data collected from an increasingly common population at universities: students who need to work while going to school. This study's findings enhance researchers' understanding of factors contributing to the successful use of smartphones in M-learning. The findings can also be used by university administrators and other practitioners to more effectively incorporate smartphones in future M-learning initiatives.

PREDICTION MODELS FOR MERGERS AND ACQUISITIONS IN THE INDIAN IT INDUSTRY

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ABSTRACT

Research on mergers and acquisitions is gaining attention in the recent years. While there are number of studies on predicting target companies in general, there are very few studies dealing with target companies in the IT industry. This paper attempts to build predictive models to identify appropriate target firms in the Indian IT industry. Classification tree based hybrid models combining C5.0 and CART along with differential error weights are used. These models are able to achieve predictive accuracies of more than 90 percent with respect to the target firms.

INTRODUCTION

Mergers and acquisitions long have been a major research area in finance. The strategy of mergers and acquisitions have been used by firms to gain from valuation discrepancies, capitalizing on inefficient management, achieving product line diversification or business diversification, and benefiting from synergistic benefits such as economies of scale and unused tax shields. Very often, the objectives of mergers and acquisitions are to compete for limited opportunities, and to help maximize shareholders wealth in the long term. These decisions are also influenced by the availability of funds. There has been an increasing interest on research in mergers and acquisitions in India due to the increase in the acquisition activity in the recent years. Many researchers have been constructing various models for identifying and predicting takeover targets. The main focus of these researchers is to identify the target companies for takeover using publicly available financial data.

Most academic researchers have focused on various models for predicting the likelihood of acquisitions and mergers. One of the early models was the acquisition likelihood model by Palepu (1986) which took into account various financial variables of the firm. Many studies tried to extend the Palepu's (1986) acquisition likelihood model by incorporating various other measures. Ambrose and Megginson (1992) used measures such as insider and institutional shareholdings in order to examine the effect of various takeover defenses. They have also considered the effect of varying proportions of fixed assets in the total asset structure of the firms. Other scholars have used measures of technical nature such as momentum, trading volume and market sentiment. (Brar, Giamouridis and Liodakis, 2009). Kim and Arbel, (1998) investigated the differentiating characteristics of merger target firms in the hospitality industry. They have used a binomial logit analysis model to predict merger targets.

The study by Holl and Pickering (1988) explored why some takeover bids give rise to merger while other do as well as the performance effects of mergers. They have analyzed 50

cases of abandoned mergers against another sample of 50 actual mergers, using various variables reflecting managerial, shareholder and financial strength considerations. The analysis was done using a discriminant function. They have found that there are significant differences between those which were successfully acquired and those which failed and that the financial variables played a significant role in the successful takeovers.

Later studies tried to improve on the predictability by bringing in the concept of profit maximization, but Barnes (1998) concluded that the profit maximization criterion was unable to improve the predictive accuracy of his model. Espahbodi and Espahbodi (2003) tried four different techniques namely logit, probit, discriminant and recursive positioning models to compare the predictive accuracies of these models. Tsagkanos, Georgopoulos and Siriopoulos (2006) extended this methodology to conditional logit model to improve the predictability. Barai and Mohanty (2012) have provided a compendium of various techniques, variables and prediction accuracies drawn from various studies.

The interest on research in the field of mergers and acquisitions in India has picked up in the recent years due to increased activity in this area. Pawaskar (2001) found that the mergers and acquisitions are mostly between smaller size firms. The firms that were targets also happened to have low growth rates in assets and have lower current ratios. Misra (2009) reported that the trading volume and the ratio of dividend to net profits were significant variables that define a typical target in food and beverage industry. On the other hand, Kumar and Rajib (2007) indicated that that historical growth in sales is an important factor in identifying the takeover targets.

While many studies dealt with mergers and acquisitions of companies in India and abroad, very few studies dealt with those in the IT industry. Kalghatgi, (2012) studied the wealth effects of mergers and acquisitions in the Indian IT Industry during the period 2008-2010. He used an event study analysis which revealed that the shareholders of the acquiring firms did not gain significantly in terms of returns. Aigbe Akhibge and Anna D. Martin (2002) studied the acquisitions by Microsoft. This study was company specific and found that the acquisitions were not received favorably by the financial markets. Kohers & Kohers (2000) studied the mergers and acquisitions in the high tech industries. Nevertheless, there were no studies on predicting takeover targets in the IT industry in India.

There are two main reasons for building predictive models for takeovers (Powell, 1997). The first is to gather knowledge about the characteristics of the firms subject to takeover in order to understand the motives of takeover. The second is from the investment perspective where those firms with high takeover probabilities can be targeted. In addition, predictive models help in identifying the right targets so that the merger/acquisition attempts can be concluded successfully.

The objectives of the study are

1. To develop models for predicting possible targets for mergers and acquisitions in the IT industry in India
2. To validate the models for predictive accuracy

3. To identify importance of different factors in predicting the target companies for mergers and acquisition

METHODOLOGY

Data was collected from the Prowess database which contains all the financial information about the companies. Data was collected for the years 1995 to 2011. The variables such as sales, income from services, reserves and surplus, paid-up equity capital, current liabilities and provisions, borrowings, PAT, EPS, adjusted EPS, increase in finances and dividend paid/proposed were extracted from the database. The companies which were either acquired or merged during the period between 1995 and 2011 were identified. For the purpose of acquisition, only those companies where more than 50 percent of the share capital was acquired were considered. There were a total of 7056 companies that were involved in IT industry. About 82 percent of these companies were software oriented where as 11 percent were ITES and the remaining 7 percent were dealing with computers, peripherals & storage devices. Of the 7056 companies, only 227 were either merged or acquired during the study period (1995-2011).

Classification trees were used to build the prediction models. The first model that was built by applying C5.0 predicted that all the 7056 companies were neither merged nor acquired. This type of gross misclassification is very common in situations where the dataset involved is a skewed dataset (Kumar and Nagadevara, 2006). The present dataset consisted of two categories of companies namely those which had been merged or acquired (Category "1" or minority category) and those which were not (Category "0" or the majority category). Category "1" accounted for only 3.2 percent of the total 7056 companies. The minority category was overwhelmed by the majority category and the classification models tend to classify all the companies as belonging to the majority category and in the process, the model makes an error of 3.2 percent only. There are two possible approaches namely over-sampling and under-sampling, to address this problem. A combination of both under-sampling as well as over-sampling was used in this study. Initially, the minority category was isolated from the dataset. Of the remaining 6829 observations, 5 non-overlapping samples of 1000 companies each were selected randomly. Each of these samples was combined with all the 227 observations of the minority category to create the dataset for building the prediction models. Classification trees were built for each of the samples using CART (classification and Regression Tree). The prediction accuracies with respect to category "1" observations were fairly high for all the 5 models. On the other hand, were not able to predict the category "0" observations with the desired accuracy level. It was decided to use a hybrid model where the category "0" predictions of the CART classification tree were used to build a C5.0 model. The scheme of the hybrid model is presented in Table 1 below. The CART model makes the predictions by separating the observations into four groups, N1, N2, N3 and N4. These are "true positive, false positive, false negative and true negative, respectively. N3 and N4 (false negative and true negative) are combined and this subset is used to build the C5.0 model. In order to obtain better predictions for the true positives,

error weighting of 3.5:4.75 was imposed on the CART model and error weighting of 3:1 on C5.0. The predictive accuracies improved significantly with the hybrid model.

Table 1: Schematic diagram of the Hybrid Model using C5.0 and CART

CART					C5.0		
Actual	Category	Prediction			Category	Prediction	
		"1"	"0"			"1"	"0"
	"1"	N1	N3		"1"	P1	P3
	"0"	N2	N4		"0"	P2	P4
	Total	N1+N2	N3+N4		Total	P1+P2	P3+P4

RESULTS AND DISCUSSION

The prediction accuracies of the models using 5 different sample sets are presented in Table 2. These are obtained based on the hybrid model described in the previous section.

Table 2: Prediction accuracies of the models

Model	True Negative	False Negative	False Positive	True Positive	Overall
Sample 1	69.45%	10.08%	30.55%	89.92%	73.76%
Sample 2	80.39%	2.71%	19.61%	97.29%	83.94%
Sample 3	64.40%	5.43%	35.60%	94.57%	70.74%
Sample 4	56.94%	0.77%	43.06%	99.23%	65.93%
Sample 5	74.26%	1.59%	25.74%	98.41%	79.22%
ALL Samples	67.37%	0.10%	32.63%	99.90%	74.21%

It can be seen from the Table 2 that the predictive accuracies of true positives are 90 percent and above. The tree structures for each of the samples were examined. The CART model had a tree depth of 5 whereas the C5.0 model, being a binary tree had a tree depth of 37. The three variables that are most important for prediction are the share capital, increase in finances and debt. These are followed by PAT and current liabilities. This is in line with many of the earlier studies. Since the 5 non-overlapping samples have given very similar tree structures and prediction accuracies, all these five samples are combined into one single composite dataset. This composite dataset has 5000 unique category "0" observations taken from the original dataset of 7056 observations. In addition, the 227 category "1" observations were repeated 4 times making a total of 6135 observations. Thus, the composite dataset is a combination of both over-sampling and under-sampling. The hybrid model was built finally using this composite dataset. The prediction accuracies of this model are presented in Table 2. It may be noted that while the prediction accuracy of true negatives is only about 70 percent, the corresponding accuracy for true positives is 99.9 percent (model with composite dataset). Since the major interest is to identify the target firms, the accuracy of true positives is more critical than that of the true negatives.

SUMMARY AND CONCLUSIONS

There has been an increasing interest in research with respect to mergers and acquisitions in the recent past. While there have been many studies on mergers and acquisitions in general and especially with respect to predicting the target firms, there were very few studies in IT industry. This study attempted to bridge this by building prediction models for identifying target firms in the Indian IT industry. Prediction models were built through a hybrid approach using CART and C5.0 classification trees. Building of these models encountered the problem of skewed datasets because of the small number of mergers/acquisitions in the dataset. This problem was overcome by a combination of over-sampling and under-sampling coupled with error weighting. The final model resulted in prediction accuracy levels of more than 90 percent with respect to the target firms. Thus, this model can be used successfully to identify the target firms.

REFERENCES

Akhibe,A;& Martin, A. (2002). Do Microsoft's acquisitions benefit the computer Industry? *Financial Analyst Journal*, 58(4), 19-27.

Ambrose, B. W. & Megginson, W. L. (1992). The Role of Asset Structure, Ownership Structure and Takeover Defenses in determining Acquisition Likelihood. *Journal of Financial and Quantitative Analysis*, 27(4) 575-589.

Barai, P. & Mohanty, P. (2012). Predicting Acquisitions in India. *Vikalpa,* 37 (3), 29-49.

Barnes, P. (1998). Can takeover targets be identified by statistical techniques? Some UK evidence. *Journal of the Royal Statistical Society: Series D (The Statistician), 47*(4), 573-591.

Brar, G., Giamouridis, D. & Liodakis, M. (2009). Predicting European Takeover Targets. *European Financial Management,* 15(2) 430-450.

Espahbodi H. & Espahbodi P. (2003). Binary Choice Models and Corporate Takeover. *Journal of Banking and Finance,* 27, 549-574

Holl, P. & Pickering, J. F. (1988). The Determinants and Effects of Actual, Abandoned and Contested Mergers. *Managerial and Decision Economics*, 9, 1-19.

Kalghatgi, J. (2012). Mergers and Acquisitions in Indian Information Technology Industry and Its Impact on Shareholders' Wealth. *International Journal of Research in Commerce, IT & Management*, 2(4), 118-122.

Kim, G. and Arbel, (1998). Predicting Merger Targets of Hospitality Firms (a Logit Model). *International Journal of Hospitality Management*, 17(3), 303-18.

Kohers, N & Theodor Kohers (2000). Value Creation Potential of High-Tech Mergers. *Financial Analysts Journal,* 56(3), 40-51.

Kumar, A. & Nagadevara, V. (2006). Development of Hybrid Classification Methodology for Mining Skewed Data Sets – A Case Study of Indian Customs Data. *Proceedings of the 4th ACS/IEEE International Conference on Computer Systems and Applications*, 584-591.

Kumar, R., and Rajib, Prabina (2007). Characteristics of merging firms in India: An Empirical Examination. *Vikalpa, 32*(1), 27-44.

Misra, S. D. (2009). Determinants of target firms in a takeover. *International Research Journal of Finance & Economics, 29*(1), 172-178.

Palepu, K. G. (1986). Predicting Takeover Targets: A Methodological and Emperical Analysis. *Journal of Accounting and Economics*, 8, 3-37.

Panigrahi, P. K. (2004). An alternative predicting model for corporate mergers and acquisitions. *Vilakshan – XIMBJournal of Management, 1*(1), 12-21.

Pawaskar, V. (2001). Effect of mergers on corporate Performance in India. *Vikalpa, 26*(1), 19-32.

Tsagkanos, Georgopoulos & Siriopoulos (2006). Predicting Takeover Targets: New Evidence from a Small Open Economy. *International Research Journal of Finance and Economics*. 4, 183-194.

THE ROLE OF MEAP IN CORPORATE MOBILE DEVICE MANAGEMENT

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ABSTRACT

In a previous paper we discussed various considerations of employees accessing corporate networks in the workplace using their own electronic devices such as tablets and smartphones. In this paper we discuss the use of a Mobile Enterprise Application Platform (MEAP) to mitigate some of the negative considerations discussed in the first paper. The primary focus of this paper is on support for multiple mobile operating systems, app development, and security.

KEYWORDS: MEAP, BYOD, Mobile Devices, Smartphones, Mobile Security, Mobile Apps

Traditionally a company or organization has provided the information technology used by its employees, but this model is changing for an increasing number of organizations. According to a study done by *Mobile Enterprise* (March, 2011) "only 36.5% of smartphones in the workplace are completely corporate-liable," meaning that the remaining 63.5% of smartphones used for business are owned by employees (Best Practices, 2012). These employee owned devices are used to connect to corporate emails, intranets, data, and other company owned resources as well as personal email, conversations, and diversions. When employees use their own devices in this way, it becomes increasingly difficult to differentiate organizational liability and employee liability. Accommodating these devices also creates problems for information technology (IT) departments.

This trend of employees bringing their own devices to perform work functions is called Bring Your Own Device (BYOD), employee-liable, or IT Consumerization. There are pros and cons to BYOD, and many considerations when one begins to implement a BYOD plan. This is discussed in some detail in our previous paper (Caldwell, Zeltmann, and Griffin, 2012).

In this paper we discuss a common way to accommodate BYOD using a mobile enterprise application platform (MEAP). The complete paper should be available soon.

REFERENCES

"Best Practices for Mobile Device Support: the Enterprise Guide to Smart Support for Smart Devices." *Mobile Enterprise.* 1 Jun 2011. Jan 30 2012. <http://mobileenterprise.edgl.com/white-papers>.

Caldwell, Chris, Steven Zeltmann, and Ken Griffin, "BYOD (Bring Your Own Device)", Competition Forum, Fall, 2012, Volume 10 (2), pages 117 – 121.

Sybase. "It's All about Security: What to Know before You Open the Doors to Smartphones and Tablets in your Enterprise." *Mobile Enterprise*. 29 March 2011. 25 Jan 2012.