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TOWARDS PREDICTING CREDIT RISK IN SRI LANKA'S BANKING SECTOR

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ABSTRACT

Decision support systems (DSS) consist of two major sub-systems; human decision makers and computer systems. Imagine a manager who has to make a five-year production planning decision. The first step of the decision-making process begins with the creation of a decision support model, using an integrated DSS program (DSS generator) such as Microsoft Excel, Lotus 1-2-3, Interactive Financial Planning Systems (IFPS) /Personal or Express/PC. DSS design is the process of identifying the key decisions through decision analysis, specifying requirements of each DSS component to support key decisions identified through decision analysis. This paper decision model for predicting credit risks in Sri Lankan banks. Figure 3 describes the decision model, who indicates the various decision components, leading to the desired decision.

KEYWORDS: *Credit Risk, Decision Making, Decision Support System, Human Decision Makers, Computer Systems, Decision Model*

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INTRODUCTION

The breathtaking pace of evolution in communications technology and the corresponding change in consumer behavior has had a significant impact on how customers perceive and use banking services (Sunari, 2014). The rapid growth of mobile technology and the ever-growing ubiquity of mobile devices over the years have resulted in mobile banking to evolve from a simple information delivery channel to a comprehensive banking transaction channel. In mobile banking schemes; financial services are availed and banking services are provided using mobile devices (Baraka et al, 2013). The challenge now for Sri Lankan banks is to develop and execute a mobile banking strategy that creates value for customers and encourages them to switch to the mobile channel from the costlier channels such as the branch, so that it would make a difference in the cost/income ratio of the banks (Sunari, 2014).

LITERATURE REVIEW

Risk Management is the application of proactive strategies to plan, lead, organize, and control the wide variety of risks that are rushed into the fabric of an organization in daily and long-term functioning (Thirupathi and Manoj, 2013).

Figure 1 describes the various types of risks that could occur in a bank and/or organization, which can be controlled if properly managed. Growing the complexity of banks' business and the dynamic operating environment, risk management has become very significant, especially in the financial sector. Risk at the apex level may be visualized as

the probability of a bank„ financial health being impaired due to one or more contingent factors. While the parameters indicating the banks„ health may vary from net interest margin to the market value of equity, the factor which can cause the important are also numerous. For instance, these could be a default in repayment of loans by borrowers, change in value of assets or disruption of operation due to reason like technological failure. While the first two factors may be classified as credit risk and market risk, banks generally have risks which exclude the credit risk and market risk as operational risk (Thirupathi and Manoj, 2013).

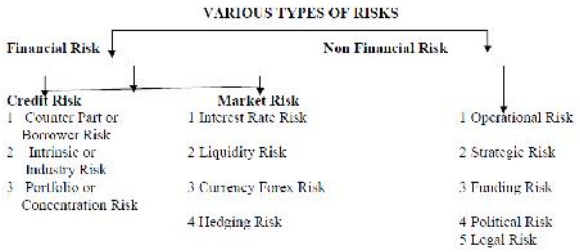

Figure 1: Types of Risks in Banking Sector (Thirupathi and Manoj, 2013)

Credit risk is a critical area in banking and is of concern to a variety of stakeholders: institutions, consumers, and regulators (Aijun, 2009). It has been the subject of considerable research interest in banking and finance communities and has recently drawn the attention of statistical researchers (Aijun, 2009). The instruments and tools, through which credit risk management is carried out, are detailed below (Thirupathi and Manoj, 2013): a) Exposure Ceilings: Prudential Limit is linked to Capital Funds; say 15% of the individual borrower entity, 40% for a group with additional 10% for infrastructure projects undertaken by the group. Threshold limit is fixed at a level lower than Prudential Exposure; Substantial Exposure, which is the sum total of the exposures beyond the threshold limit should not exceed 600% to 800% of the Capital Funds of the bank (i.e. Six to eight times). b) Review/Renewal: Multi-tier Credit Approving Authority, constitution wise delegation of powers, Higher delegated powers for better-rated customers; a discriminatory time schedule for review/renewal, Hurdle rates and Benchmarks for fresh exposures and periodicity for renewal based on risk rating, etc are formulated. Other tools include risk rating model, portfolio management, loan review mechanism, liquidity risk, interest rate risk, forexrisk and country risk.

To overcome the risk and to make banking function well, there is a need to manage all kinds of risks associated with the banking. Risk management becomes one of the main functions of any banking services risk management consists of identifying the risk and controlling them, means keeping the risk at the acceptable level. These levels differ from institution to institution and country to country. The basic objective of risk management is to stakeholders; value by maximizing the profit and optimizing the capital funds for ensuring long -term solvency of the banking organization. Providing a support system for managing the credit risk related information, towards predicting credit risk is necessary.

Decision support systems are gaining an increased popularity in various domains, including business, engineering, the military, and medicine. They are especially valuable in situations in which the amount of available information is prohibitive for the intuition of an unaided human decision maker and in which precision and optimality are of importance (Marek and Roger, 2002). There are three fundamental components of DSSs; database management systems, model-based management system and dialog generation and management system. These constitute the components of the architecture of DSS. The development process of DSS relates to the long-term business plans of the organizations. DSS requires resources like capital, time and capacity (Tripathi, 2011). The end result is information in the form of reports.

The Decision Support System (DSS) may be developed using following ways; Prototype method and Lifecycle approach (Tripathi, 2011).

A situation where a banking area is poor in internet connectivity, there will be a need for proposing a topology for improving the connectivity and performance. These could begin with a survey for a better topology (Datukun et al, 2016a; Datukun et al, 2016b). Improving network performance is necessary for any organization (Datukun et al, 2017). This includes tourist centers for free and conveniently connecting virtual tourism. With the increasing levels of deployment of various forms of high-speed (or broadband) services within today's Internet, there is new impetus to find some usable answers that allow both providers and users to place some objective benchmarks against the service offerings. Furthermore, with the lift in access speed with broadband services, there is an associated expectation on the part of the end user or service customer about the performance of the Internet service. It should be "better" in some fashion, where "better" relates to the performance of the network and the service profile that is offered to network applications. And not only is there an expectation of "better" performance, it should be measurably better after diagnosing it (On wudebelu et al, 2014). This will help in browser-based management information system provided for administrative users in internet banking as banks have traditionally been in the forefront of harnessing technology to improve their products, services, and efficiency (Mittal et al, 2000). There are some technologies that are in general use outside of just the Internet banking field which can be used to secure online transactions (Matthew, 2008). Internet banking would be easier to harness credit risk related information for predicting credit risk.

METHODOLOGY

Having defined the research problem, literature will be reviewed to establish the theoretical foundation of the research. The hypothesis will next be formulated after which the questionnaire will be designed. The data will be collected by means of administering the questionnaire to the potential customers, which are the decision-making individuals in an organization. In this case, a bank will be used as a target place. The data will be analyzed after which a prototype of a decision support system (DSS) will be developed, whose function will revolve around the methodology process.Figure 2 presents the methodology flow diagram as discussed.

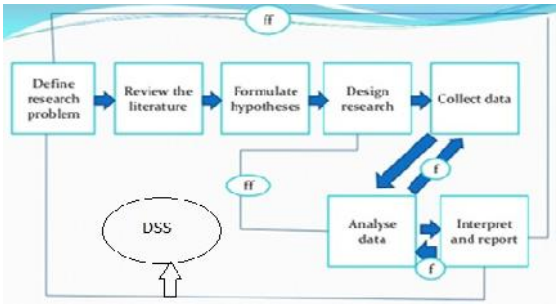

Figure 2: Methodology Flow Diagram

Decision Model

Decision support systems are powerful tools integrating scientific methods for supporting complex decisions with techniques developed in information science and are gaining an increased popularity in many domains. They are especially valuable in situations in which the amount of available information is prohibitive for the intuition of an unaided human decision maker and in which precision and optimality are of importance. Decision support systems aid human cognitive deficiencies by integrating various sources of information, providing intelligent access to relevant

knowledge, aiding the process of structuring, and optimizing decisions. DSSs are theoretically correct and appealing way of handling uncertainty and preferences in decision problems. They are based on carefully studied empirical principles underlying the discipline of decision analysis and they have been successfully applied in many practical systems. We believe that there are several attractive features that are likely to prevail in the long run as far as the technical developments are concerned. Because DSSs do not replace humans, they rather augment their limited capacity to deal with complex problems. The user interface determines whether a DSS will be used at all. If so, whether the ultimate quality of decisions will be higher than that of an unaided decision maker. Figure 3 presents the decision model for developing the DSS.

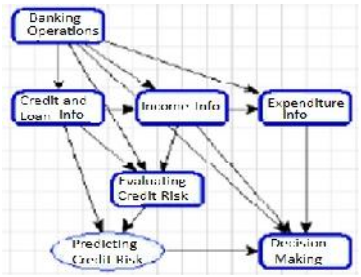

Figure 3: Decision Model

CONCLUSIONS

In as much as the decision model is important in providing a DSS, DSS prototype will be will be in the next work. In the subsequent part of this work, which is the next work, shots of running application will be presented. This will be towards a test-run, whether the given solution is viable to support the decision in predicting credit risk or not. Hence, we could conclude that this model will subsequently provide a prototype for DSS. As such the next paper will be in connection with this one.

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