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A Decision Support System's Architecture FOR Managing Credit Risk IN Sri Lanka's Banks

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ABSTRACT: *Humandecision makers and computer systemsconstitutes the two major sub-systemsin decision support systems (DSS). Imagine a manager who has to make a five-year production planning decision, what would happen if a sensitive mistake is made? The decision-makingprocess begins with the creation of a decision support model. A decision model was presented in a paper titled "Towards predicting credit risk in Sri Lanka's banking sector" by Amal Illesinghe & Sellappan Palaniappan (2018). It was published in International Journal of FinancialManagement (IJFM) with International Academy of Science, Engineering and Technology. The model described the process of identifying the key decisions through decision analysis, specifying requirements of each DSS component to support key decisions identified through decision analysis.In connection, this paper presents the conceptual architecture of the decision support system which is important for developing the actual model. The architecture shows the input and output process as described in Figure 2.*
KEY WORDS: *Database management system, Model-base management system, Dialog generation and management system,Decision support system and Architecture of DSS.*

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I. INTRODUCTION

Database management system, model-based management system and dialog generation and management system constitutes the three fundamental components of Decision support systems(DSSs)(Marek and Roger, 2002). DBMS serves as a data bank for the DSSs, storing large quantities of data that are relevant to the class of problems for which the DSS has been
designed and provides logical data structures (as opposed to the physical data structures)

with which the users interact. DBMS providing independence between specific models that are used in a DSSfrom the applications that use them. DGMS provides interaction witha DSS.The primary responsibility of a DGMS is to enhance the ability of the system userto utilize and benefit from the DSS.DSSs can be applied in management and planning in business, health care, themilitary, banking systems and any area in which management will encounter complex decision situations.

II. LITERATURE REVIEW

Incommunications technology, the breath-taking pace of evolution and the correspondingchange in consumer behaviour has had a significant impact on how customers perceive anduse 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 simpleinformation 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 branch, so that it would make a difference to the cost/income ratio of the banks (Sunari, 2014).

Risk Management is the application of proactive strategy to plan, lead, organize, and control the wide variety of risks that are rushed into the fabric of an organizations indaily and long-term functioning(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 considerableresearch 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% for 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 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; discriminatory time schedule for review/renewal, Hurdle rates and Bench marks for fresh exposures and periodicity for renewal based on risk rating, etc are formulated. Other tools includerisks rating model, portfolio management, loan review mechanism, liquidity risk, interest rate risk, forex risk 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 acceptable level. These levels differ from institution to institution and country to country. The basic objective of risk management is to stakeholders; value by maximising the profit and optimizing the capital funds for ensuring long term solvency of the banking organisation. 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 constitutes the components of the architecture of DSS.The development process of DSS relates with 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 Life cycle approach (Tripathi, 2011).

A situation where a banking area is poor in internet connectivity, there will be 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 in any organization (Datukun et al, 2017). This include tourist centres for freely 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 (Onwudebelu et al, 2014).This will help in browser-based management information system provided for administrative users in internetbanking 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 is in general used 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.

III. METHODOLOGY

In connection to the methodology flow presented in International Journal of FinancialManagement (IJFM) by Amal Illesinghe & Sellappan Palaniappan (2018), the DSS architecture will be focused on.Figure 1 describe the architecture that will be followed to design the conceptual framework accordingly.

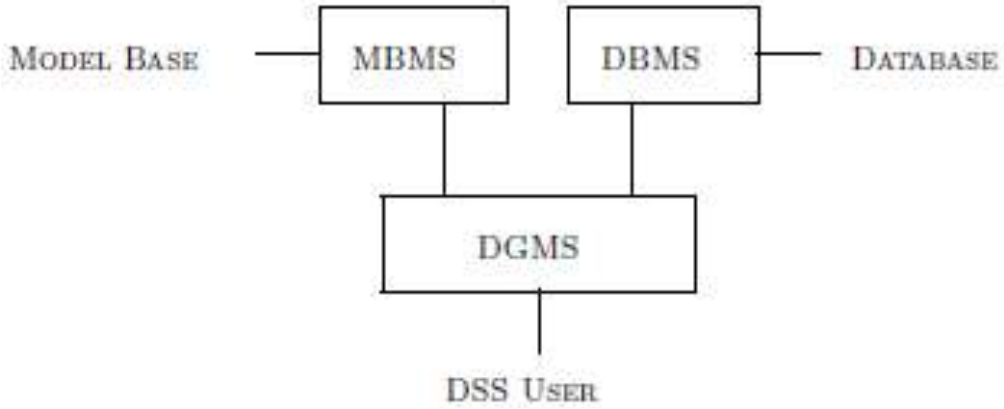

Figure 1:Architecture of a DSSs(Marek and Roger, 2002)

The decision model earlier presented in International Journal of FinancialManagement (IJFM) by Amal Illesinghe & Sellappan Palaniappan (2018) will be based on the DGMS component in Figure 1.

Conceptual Decision Support System

Thethree components specified in Figure 1 isintegrated in DSS architectures in Figure 2and play a prominent role in their structure. Interaction goes on among them within the DSS process module. DBMS storeslarge quantities of data that are relevant to the class of problems for which the DSS has beendesigned. MBMS transforms data from theDBMS into information that is useful in decision making.DGMS enhances the ability of the system userto utilize and benefits from the DSS.

Essentially, the user interacts with the DSS through the DGMS. This communicates with the DBMSand MBMS, which screen the user and the user interface from the physical details of the model baseand database implementation.

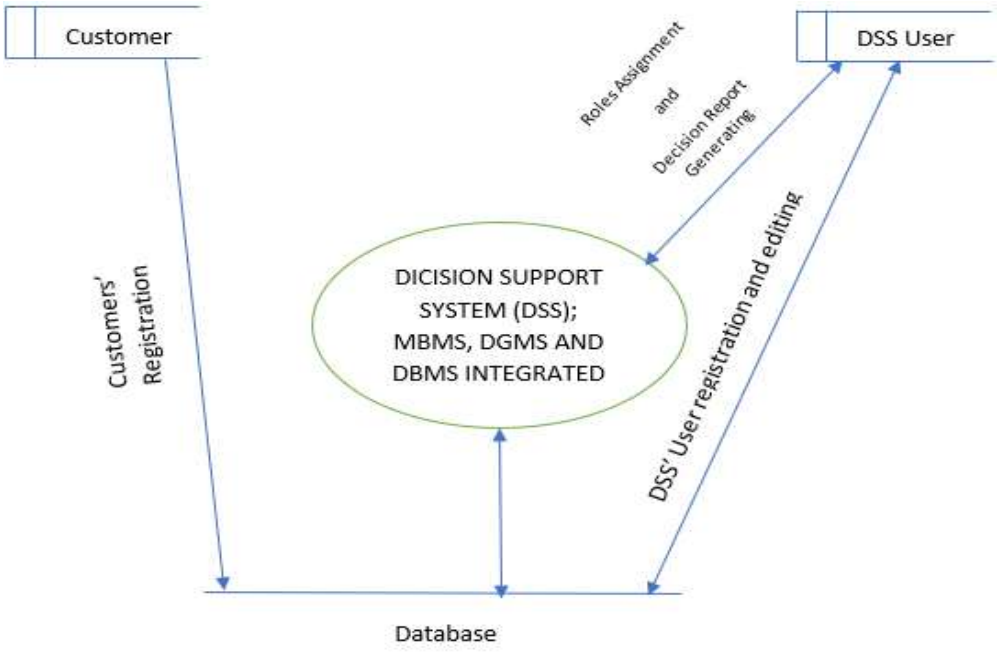

Figure 2:Conceptual DSS Architecture

IV. CONCLUSION

The DSS architectureis important for developing the actual model. Hence, this will be used to determine the actual DSS model. The relevant input data will be related to basic information that could be useful for credit risk decision. The registration information will constitute the input data, whereas, the reports generated for necessary decision will constitute the output data respectively.

REFERENCES

[1]. SunariDandeniya (2014). Expanding Financial Services Frontier and Mobile Banking in Sri Lanka. 26th Anniversary Convention.
[2]. Baraka W. Nyamtiga, Anael Sam and Loserian S. Laizer (2013). Enhanced Security Model for Mobile Banking Systems in Tanzania. International Journal of Technology Enhancements and Emerging Engineering Research. 1 (44).
[3]. Datukun KalambaAristarkus, Sellappan Palaniappan, TatchanaamoortiPurnshatman (2016a). Towards proposing network topology upgrade in Salem University Lokoja. Research Publish Journals 4 (3).
[4]. Datukun KalambaAristarkus, Sellappan Palaniappan and TatchanaamoortiPurnshatman (2017). Hybrid Topology Design for Improving Network Performance. Global Journal of Computer Science and Technology: ENetwork, Web & Security. 17 (3).
[5]. Datukun KalambaAristarkus, Sellappan Palaniappan, TatchanaamoortiPurnshatman (2016b). Graph Model for Physical Topology Design. IASET: Journal of Computer Science and Engineering (IASET: JCSE)ISSN(P): Applied; ISSN(E): Applied. 1 (2).
[6]. Onwudebelu Ugochukwu, Datukun KalambaAristarkus, S. E. Adewumi (2014). Diagnosing Salem University Lokoja Network for Better Network Performance. Universal Journal of Communications and Network. 2(2). 40 – 46
[7]. MittalS. R., M. P. Kothari, N. L. Sarda, M. R. Srinivasan, S. H. Bhojani, Romesh Sobti, K. R. Ganapathy, Deepak Ghaisas, Ravi Nair, K. M. Shettigar (2000). Report on Internet Banking.
[8]. Aijun Zhang (2009). Statistical Methods in Credit Risk Modeling. A dissertation submitted in partial fulllment of the requirements for the degree of Doctor of Philosophy (Statistics) in The University of Michigan.
[9]. Matthew Johnson (2008). A new approach to Internet banking. Technical Report. Computer Laboratory. University of Cambridge. UCAM-CL-TR-731. Number 731.
[10]. Thirupathi Kanchu, M. Manoj Kumar (2013). Risk Management In Banking Sector -An Empirical Study. International Journal of Marketing, Financial Services & Management Research. 2 (2).
[11]. Marek J. Druzdzel and Roger R. Flynn (2002). Decision Support Systems. Decision Systems Laboratory. School of Information Sciences and Intelligent Systems Program. University of Pittsburgh Pittsburgh. PA 15260.
[12]. Tripathi K. P. (2011). Decision Support System Is A Tool for Making Better Decisions in the Organization. Indian Journal of Computer Science and Engineering (IJCSE). 2 (1). 112-117.
[13]. Amal Illesinghe & Sellappan Palaniappan (2018). Towards Predicting Credit Risk in Sri Lanka's Banking Sector. International Journal of FinancialManagement (IJFM). International Academy of Science, Engineering and Technology 7 (3).

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