**The Open University of Sri Lanka**

**Faculty of Engineering Technology**

**Bachelor of Software Engineering Honours**

**Department of Electrical and Computer Engineering**

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**EEX5362 – Performance Modelling**

**Deliverable 01 – Mini Project**

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1. **System Overview**

**The selected system for** **Performance Analysis of a Banking Finance System.**A banking finance system is used by banks and financial institutions to manage different financial activities such as deposits, withdrawals, fund transfers, and loan payments.  
This system helps to record, monitor, and manage all the financial transactions of customers in a secure and accurate manner.

The system operates using a central database and multiple servers to handle large numbers of users. In modern banking, thousands of transactions happen every second, and the system should work fast without any delay or data loss. Therefore, analysing the system performance is very important to make sure it is running efficiently and can handle heavy workloads smoothly.

1. **High-Level Problem**

The main problem identified in this system is the delay and performance issues that occur when many users try to do transactions at the same time.  
When the number of customers increases, the banking servers can become overloaded, and the system may respond slowly or even fail to process some transactions.

This can cause:

* Delay in online money transfers
* Server timeouts during high usage hours
* Unbalanced use of CPU and memory resources
* Poor customer experience

To overcome these challenges, a performance study is needed to identify where the bottlenecks are and how to improve response time, resource usage, and throughput of the banking finance system

1. **Dataset Description**

The dataset used for this study represents the transaction records processed in the Banking Finance System.  
Each record shows the details of a customer’s financial activity and the system’s performance during the transaction.

|  |  |
| --- | --- |
| Field Name | Description |
| Transaction\_ID | A unique identification number given to each transaction (TXN001, TXN002). |
| Account\_No | The customer’s account number used for the transaction. |
| Transaction\_Type | Type of the transaction, such as Deposit, Withdrawal, Fund Transfer, or Loan Payment. |
| Amount (LKR) | The amount of money involved in the transaction, recorded in Sri Lankan Rupees. |
| Time\_Stamp | The exact date and time when the transaction took place. |
| Processing\_Time (ms) | The time taken by the system to complete the transaction, measured in milliseconds. |
| Server\_ID | The server that processed the transaction. This helps to measure the load handled by each server. |

**A small sample of the dataset:**

1. **Performance Objectives**  
     
   The main goal is to evaluate and improve the performance of the banking finance system.  
     
   The performance objectives are:

|  |  |
| --- | --- |
| Objective | Description |
| Minimize Response Time | Reduce the average time taken to process each transaction to below 200 milliseconds. |
| Maximize Throughput | Increase the total number of transactions the system can handle per second. |
| Optimize Resource Utilization | Make sure CPU and memory usage are balanced across servers to prevent overload. |
| Ensure Scalability | Maintain stable performance even when the user load increases up to five times. |
| Identify Bottlenecks | Find the specific modules, queries, or servers that cause delays during heavy usage. |

By focusing on these objectives, the banking system can provide faster service, handle more customers at the same time, and maintain reliability

1. **Expected Outcomes**   
     
   **The expected results are:**

* Faster transaction response time
* Better server load balancing
* Identification of performance bottlenecks
* Improved scalability and stability of the system
* Enhanced overall user experience