**Development of a Loan Management System for Paku BHS Coop using C# Windows Form**

A Project

Presented to

The Faculty of Visayas State University

In Partial Fulfillment

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CSci 23 - Applications Development and Emerging Technologies

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**Abstract**

This section should contain a comprehensive but concise summary of the whole manuscript to highlight the importance and relevance to the field. It should describe the context and the purpose of the study, methods, results, conclusions, and significance. Complete this section when the manuscript has been finalized.

**Preface**

This section should contain a concise explanation and background of the project on how the current study contributes to the stakeholders and/or the existing literature. It should briefly contain the acknowledgements to the funding entities, contributors, stakeholders, and/or respondents. This section should also briefly address any limitations and potential biases of the study. Complete this section when the manuscript has been finalized.

**Chapter 1 INTRODUCTION**

**1.1 Statement of the Problem**

Despite the growing need for access to credit, traditional lending institutions often have stringent requirements that exclude many people from obtaining loans. For this reason, many people still go to a local money lender to loan money. However, many local money lenders still uses primitive technologies like paper, and basic calculator to store the data and do the calculations (Kondo 2015). To address these issues, this paper presents LoanEase, a desktop application that allows lenders to lend easily, with a built-in calculator that provides automated calculations and a database to store all the data. The problem this paper aims to address is the lack of accessible and user-friendly application for local money lenders to use in order to transact their business faster.

**1.2 Current State of Technology**

There are many payment apps such as GCash, which allows users to send and receive money to and from other users. These apps typically link to a user's bank account or credit card and use advanced encryption and authentication technologies to ensure the security of the transaction (Monteiro 2021). There are also blockchain-based lending platforms that use smart contracts to automate the lending process. These platforms are decentralized, meaning that there is no central authority controlling the lending process. Instead, borrowers and lenders interact directly with each other through the blockchain network (Frankenfield 2023). However, they often have tringent requirements that exclude many people from obtaining loans that is why many people still go to a local money lender to loan money which still uses primitive technology when conducting its transaction.

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**Chapter 2 INTRODUCTION**

**2.1 Problem Statement**

The lack of accessible and user-friendly applications for local money lenders to use when lending money is an ongoing issue that is yet to be addressed. Despite the growing need for access to credit, traditional lending institutions often have strict requirements that exclude many people from obtaining loans. Consequently, many individuals still resort to local money lenders to borrow money. However, many local money lenders still use primitive technologies like paper and basic calculators to store data and perform calculations, resulting in a slow and inefficient lending process. This study aims to address this problem by developing LoanEase, a desktop application that will enable local money lenders to lend money with ease, a built-in calculator that provides automated calculations, and a database to store all the data.

**2.2 Objectives**

**2.2.1 General Objectives**

LoanEase aims to address the lack of accessible and user-friendly software for local money lenders to manage their lending activities more efficiently by providing automated calculations and a database to store all the data.

**2.2.2 Specific Objectives**

1. To provide an easy-to-use platform for local money lenders to transact their business. By developing a user-friendly interface, LoanEase seeks to simplify the lending process for money lenders who are still using primitive technologies like paper and basic calculators.
2. To provide automated calculation process, ensuring accurate and reliable calculations for both lenders and borrowers. This feature helps to reduce the possibility of errors, which can cause confusion and mistrust between lenders and borrowers.
3. To create a centralized database to store all lending data. The system will provide an easy-to-access, real-time dashboard to track all lending activities, making it easier for money lenders to manage their business.

**2.2.3 Scope and Limitations**

The scope of LoanEase is to provide a user-friendly and accessible desktop application for local money lenders to manage their lending activities more efficiently. The application will have a built-in calculator that provides automated calculations and a centralized database to store all lending data. The system will be capable of processing loan applications, generating repayment schedules, and tracking repayment histories. It will also generate reports to help lenders manage their business more effectively.

There are several limitations to the LoanEase application that should be considered. Firstly, the application is limited to local money lenders and is not intended for use by traditional lending institutions. Secondly, the system is limited to managing lending activities and does not provide other financial services like investment management or financial planning.

The implementation of LoanEase could have several implications. Firstly, it could improve the accessibility and efficiency of lending activities for local money lenders, making it easier for borrowers to obtain loans. This could lead to increased financial inclusion, particularly for individuals who are excluded from traditional lending institutions due to stringent requirements.

**Chapter 3 LOANEASE**

* 1. **Introduction**

LoanEase is a desktop application designed to simplify the process of lending money and is specifically created for money lenders who need an efficient and reliable tool to automate the calculation process when someone borrows money. This app offers a user-friendly interface that allows lenders to easily input borrower information and loan amount, and automatically generates the monthly interest to be paid. It can store all the necessary information, making it easy for lenders to access and manage their loan records.

**3.2 System Design and Specifications**

**3.2.1 Hardware**

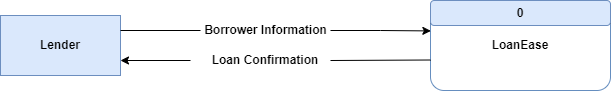
The application is designed to be used on desktop or laptop computers, and therefore, each stakeholder, end-user, and proponent will require access to a computer. LoanEase requires internet connectivity to function, and therefore, all users should have access to stable and reliable internet connectivity.

**3.2.2 Software**

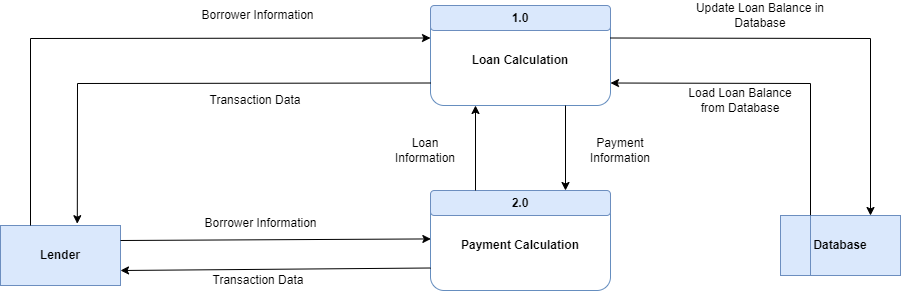
Firstly, the .NET Framework will be required to support the development of the application using C#. The .NET Framework provides a large class library, runtime environment, and other tools necessary for software development. Secondly, Visual Studio 2022, an integrated development environment (IDE), will provide a comprehensive set of tools for developing, debugging, and deploying the software application. Thirdly, Windows Forms, a graphical user interface (GUI) class library included in the .NET Framework, will provide a set of controls that can be used to create GUI applications for Windows operating systems.

In addition to these, Google Drive will also be required to store app data since it provides a reliable backup solution, ensuring that the data is always available, even if the local storage device is lost or damaged. Lastly, stakeholders, proponents, and end-users will need to have a computer running a supported version of Windows operating system, as the LoanEase application is designed to run on Windows operating systems.

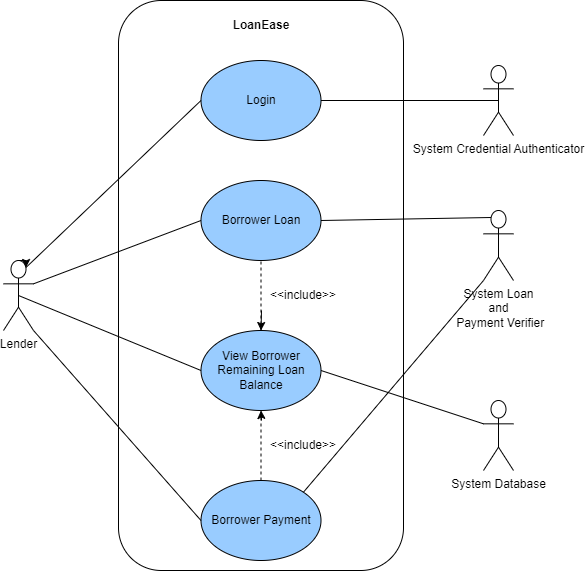
**3.2.3 Context Diagram**

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**3.2.4 Diagram 0**

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**3.2.5 Use Case Diagram**

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**3.2.6 Use Case Scenarios**

Borrower Requests a Loan

| **Use Case Name** | **Borrower Requests a Loan** | |
| --- | --- | --- |
| Summary: | Borrower requests a loan to Lender. | |
| Actors: | Lender, Borrower, System | |
| Preconditions: | The lender must be logged in in the system. | |
| Postconditions: | The loan balance of the the borrower will be updated in the database | |
| Basic Flow: | **Actor Action** | **System Response** |
| 1. Lender inputs borrowers information including the amount to borrow. | 1.1. The system will look if the borrower has an existing loan.  1.2. If the borrower has an existing loan, the new loan will be added to the existing borrower entity. Else, the system will create a new entity and loan will be added there.  1.3. The system will calculate the monthly interest. |
| 2. Lender saves the transaction in the database. | 2.1. The loan balance of the borrower will be updated. |
| Exceptions: | 1. If the borrower does not agree with the interest rate, the transaction is canceled. | |

Borrower Pays a Loan

| **Use Case Name** | **Borrower Pays a Loan** | |
| --- | --- | --- |
| Summary: | Borrower pays a loan to the lender. | |
| Actors: | Lender, Borrower, System | |
| Preconditions: | The lender must be logged in in the system. | |
| Postconditions: | The loan balance of the the borrower will be updated in the database. | |
| Basic Flow: | **Actor Action** | **System Response** |
| 1. Lender inputs borrowers information including the amount to pay. | 1.1. The system will look for the borrower’s information in the database.  1.2. The system will calculate the remaining balance of the borrower after the payment. If there is still a loan balance after payment, the system will generate the new monthly interest. Else, the borrower entity’s loan will be marked as paid. |
| 2. Lender saves the transaction in the database. | 2.1. The loan balance of the borrower will be updated. |
| Exceptions: | 1. If the borrower does exist in the database, there will be no transaction that will happen. | |

Borrower Checks Loan Balance

| **Use Case Name** | **Borrower Checks Loan Balance** | |
| --- | --- | --- |
| Summary: | Borrower wants to check their remaining loan balance and monthly interest. | |
| Actors: | Lender, Borrower, System | |
| Preconditions: | The lender must be logged in in the system. | |
| Postconditions: | The borrower will be informed about their remaining balance. | |
| Basic Flow: | **Actor Action** | **System Response** |
| 1. Lender inputs borrowers information. | 1.1. The system will look for the borrower’s information in the database.  1.2. The system will display borrower’s information including their remaining loan balance. |
| Exceptions: | 1. If the borrower does exist in the database, there will be no transaction that will happen. | |

**3.2.7 Summary**

The lender of the LoanEase application needs to perform these several high-level processes or modules to cover all the specified use cases. The first use case is when the borrower requests a loan. The lender needs to input the borrower's information, including the amount to borrow. The lender also needs to save the transaction in the database. The borrower's loan balance will also be updated.

The second use case is when the borrower pays a loan. To perform this action, the lender must be logged in to the system. The lender inputs the borrower's information, including the amount to pay. The lender saves the transaction in the database, and the loan balance of the borrower will be updated.

The third use case is when the borrower checks the loan balance. To perform this action, the lender must also be logged in to the system. The lender inputs the borrower's information, and the system looks for the borrower's information in the database. The system displays the borrower's information, including their remaining loan balance.

**Chapter 4 PERFORMANCE ANALYSIS**

**4.1 Introduction**

The application has undergone functional and non-functional testing as performed by the developer, testers, the instructor, and panelists. The areas that were observed, validated, and tested are the requirements and the additional features.

The minimum requirements are the functionalities that make the application practical and usable. These are the workflows that must be undergone to simulate the complete stakeholders’ flowchart. The additional features are what makes the application unique. The additional features are not found in the stakeholders’ flowchart but are implemented because it is beneficial to its end-users. The application provides local money lenders with a user-friendly and accessible desktop application for managing their lending activities. The application enables lenders to store borrower information, calculate loan amounts and interest rates, generate loan agreements, and track loan payments. The application is designed to streamline lending processes, making it easier and faster for lenders to transact their business.

**4.2 Experimental**

The “one-cycle” was carefully followed to test whether the requirements were met. This begins with a borrower requesting a loan. The lender must log in into the LoanEase application. Lender then inputs borrower's information and the amount to borrow. The system will then calculates the monthly interest and displays it to the lender. The lender saves the transaction in the database and the loan balance of the borrower will be updated. The second one is when the borrower pays their loan. The lender logs in to the system and inputs the borrower's information and the amount to pay. The loan balance of the borrower will be updated and updated in the database. The third one is when the borrower wants to check their remaining loan balance. The lender logs in to the system and inputs borrower's information.The system displays the borrower's information, including their remaining loan balance.

The additional features were also tested whether it is functional. These additional features are calculating the monthly interest, remaining loan balance after payment, and new monthly interest after payment. The monthly interest calculation was tested by inputting different loan amounts and verifying that the interest calculated by the system was accurate. The remaining loan balance after payment was tested by inputting a loan payment amount and verifying that the system accurately deducted the payment from the borrower's balance. Finally, the new monthly interest after payment was tested by verifying that the system correctly recalculated the interest based on the new remaining balance after the payment. All tests were conducted successfully, and the additional features were deemed to be fully functional.

**4.3 Result and Analysis**

The application was able to perform the requirements and additional features which state that it is functional and usable.

**4.4 Summary**

The application was able to perform all the requirements which state that it is functional and usable.

**Chapter 5 CONCLUSION**

The conclusion of a project proposal should summarize the key points of the proposal and provide a clear recommendation as to whether the project should be pursued or not. It should also include a summary of the potential risks and benefits associated with the project.

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**ACKNOWLEDGEMENTS**

**APPENDICES**

**User Manual**