GLOBUS

**Globus** An International Journal of Management & IT
A Refereed Research Journal
Vol 12 / No 2 / Jan-Jun 2021 ISSN: 0975-721X

# CREDIT MANAGEMENT SYSTEM: AN EFFECTIVE TOOL FOR CREDIT COOPERATIVES IN THE PHILIPPINES

*Chester L. Cofino

**Paper Received**: 25.05.2021 / **Paper Accepted**: 18.06.2021 / **Paper Published**: 22.06.2021
**Corresponding Author:** Chester L. Cofino; Email: chestercofino@gmail.com; doi:10.46360/globus.mgt.120211013

**Abstract**

This study aims to solve the problems encountered in the cooperatives in the Philippines by developing a system. It followed a Waterfall Model under the Software Development Life Cycle (SDLC) in the development and evaluating the design. The system caters to all significant transactions done by a credit cooperative from record management, creating members and applications for loans, generating amortization schedules, loan payments, generating reports, and tracking members' transactions. A survey questionnaire was used to determine the effectiveness of the application as rated by the respondents. Upon completing the study, it found out that the respondents wanted the system to be implemented for better and well-managed transactions in their cooperative.

**Keywords**: Credit Management System, Credit Cooperatives, Credit Transactions, Waterfall Model, ISO/IEC 9126-1 Software Evaluation Criteria.

## Introduction

Implementing a credit management system can be complex. It involved understanding the basic needs of the potential members and how they can be administered. This required an accurate formula for the exact calculations on the transactions. It also demands patience from the developer to develop the system to make the cooperative's lasting goals and objectives be a reality, and its visions must be real to the members' lives. This is one of the most intimate, sensitive, and critical functions in any business. The cooperative must have an efficient credit policy and assures the business members gain their confidence and trust [1]. Administrators within the agency or company with credit cooperatives must provide complete training to their personnel on credit terms and conditions formulation [2]. Consequently, creating this kind of system is intricate and must be critically analyzed before doing.

Many small cooperatives in the Philippines operated its transaction using the traditional process of lending money, records management, and creating reports to the transactions they made. This situation leads to data redundancy, data consistency, and a time-consuming process, causing multiple files to keep, which results in a decrease in data quality. Another problem is the inaccurate computation such that members questioned the cooperative administrator how they do their calculations. There is also low participation of the members in policy making, resulting in the cooperative's improper management [3]. The financial crisis also affects the increased scarcity of excellent and reliable services [4].

To solved this dilemma, cooperatives dreamed of having a credit management system that could be of great help to an easy and fast flow of transactions, minimal data redundancy, improve data consistency and data quality, convenient and effective processes. It would provide a secure record of its valued members and the cooperative as a whole. The developed system would satisfy its needs and accomplish its mission, vision, and members' expectations.

## System Development

It followed a waterfall model procedure in

**Central Philippines State University, Philippines.*

developing and evaluating the system, which works through plan, design, and builds phases and only starts to make once the design is clear and final [5].

The waterfall model provides precise data on what to develop and the requirements needed in the development. Proper documentation is followed for the quality of the system [6].

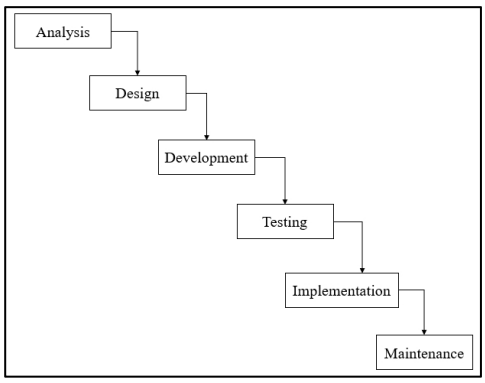


**Figure 1: Waterfall Model (S.Balaji & Murugaiyan, 2012) [9]**

## Analysis

During this phase, the solution is defined in detail on building it. Requirements of the system were collected by analyzing the user's needs through an in-depth interview.

## Design

The context diagram shows the data to be input and process by the system as output.

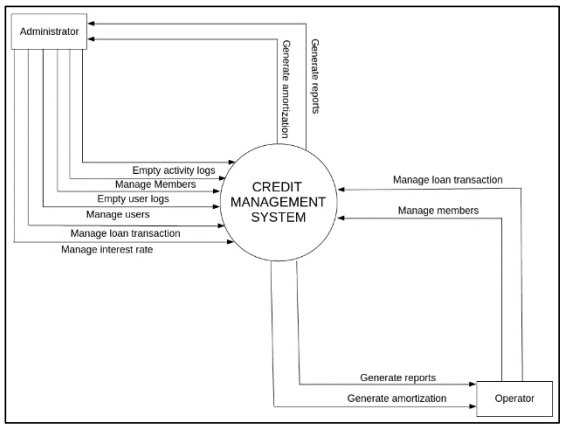


**Figure 2: Context Diagram**

Figure 3 shows the network connectivity of the system from the cooperative to the members. The system is hosted through a dedicated server installed in the office. Members can access their loan transactions through accessing the system link via browser through mobile phone, laptop, or desktop with internet connectivity.

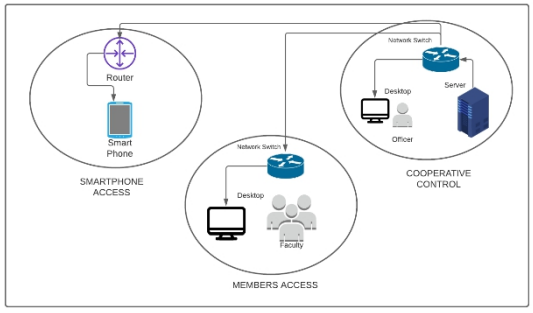


**Figure 3: Network Diagram**

The diagram below identified the business process of the credit management system as where the data flow of each transaction from the system.

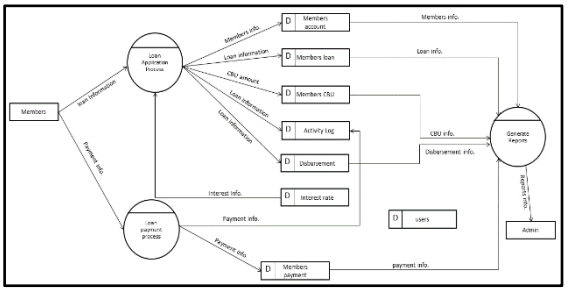


**Figure 4: Data Flow Diagram**

## Development

Requirements were grouped into a logical design and physical design which described a combination of specific software and hardware components. They were used to develop and implement an effective credit management system. Providing reliable service on money lending, records management, tracking loan transactions, and creating reports.

Table 1 shows the software and hardware requirements in the development of the system. It specified the recommended version used in the development.

**Table 1: Software Requirements (Recommended)**

| Software | Version |
|---|---|
| Sublime Text Editor | v3.2.2 Build 3211 |
| XAMPP DBMS Server | v3.2.4 |
| Browser (e.g. Google Chrome) | Latest version |
| Composer | V4.1 |

**Table 2: Hardware Requirements (Recommended)**

| Device | Specifications |
|---|---|
| Central Processing Unit (CPU) | Processor: Intel Core i7-4510U |
| Monitor | 17'' 1024x768 resolution |
| Keyboard | Standard Keyboard |
| Mouse | Standard Mouse |
| Hard Disk Drive (HDD) | 1 TB |
| Random Access Memory (RAM) | 4 GB |
| Switch | 5 Port 10/100Mbps Mini Switch |
| Network Cable | UTP Cable Straight Through type |
| Router | Any type |

## Testing

In the testing phase, a Unit Testing was conducted in which it was tested to check for errors and other issues of debugging. This stage released the beta system used for testing and debugging for better improvement to have an effective method for the cooperative.

## Implementation

In the implementation phase, the system was presented as a proposal for utilization to the members, and officers of some cooperatives. The system was recommended for utilization and conducted orientation through webinars to the users.

- **System UI**

In the dashboard page, presentations of data in a form of graphical charts are displayed. Using the graphical presentation user can identify directly the financial allotment of the cooperative from the collections, disbursement and statement of account. Major links are also presented in the dashboard page.

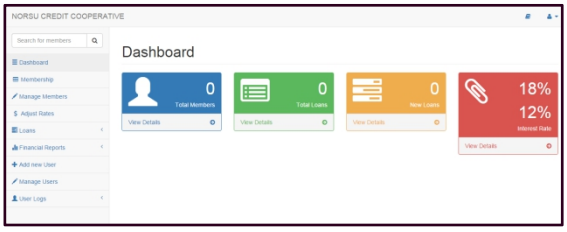


**Figure 5: Dashboard**

Figure 6 shows the membership form for any qualified member to join the cooperative. The user would input all the necessary data required for a membership application.

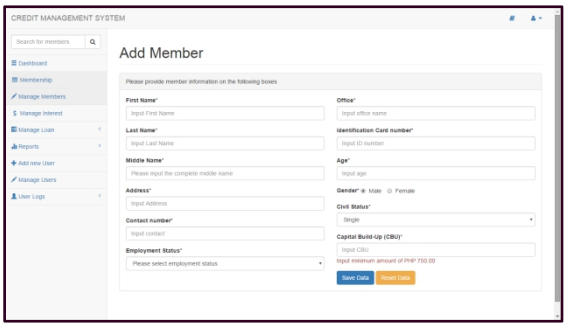


**Figure 6: Membership**

Part of the system is the management of interest based on what is the current interest approved. On the interest page, the user can modify the current interest anytime. Usually, the cooperative manager has the authority to change the interest as approved by the board of directors. The interest history section also helped the user identify the previous rates from the past year, month, or day.

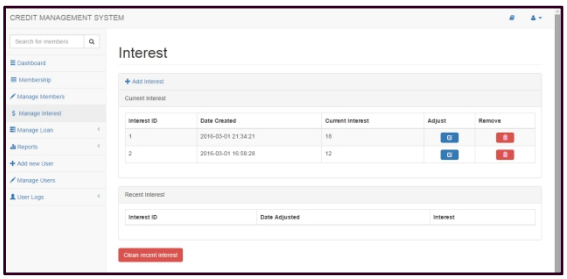


**Figure 7: Interest**

There are two types of loan transactions: the application for creating a member's first application on loan and the transaction where payments, capital build-up, loan updates, amortization schedule, insurance, interest, and current balance are processed. When a member applies or pays a loan, the user would navigate to the loan transaction page.

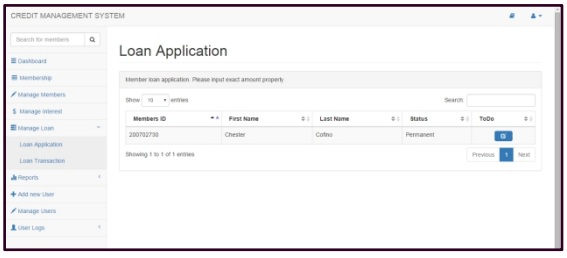


**Figure 8: Loan Application**

The disbursement report page shows the members who acquired the loan to the cooperative. This shows the cooperative disbursed's total money.

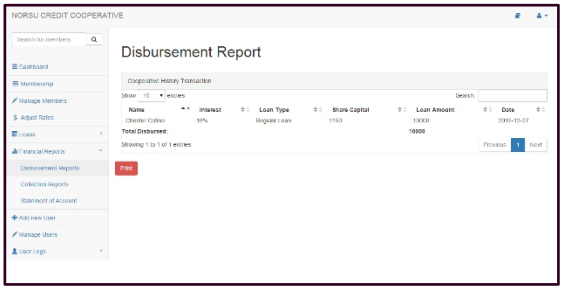


**Figure 9: Disbursement Report**

The figure below shows the collection report page gathered and is keep listed in the form of a report. This collection includes the payment of the members' loans, interest, and capital build-up, commonly known as member's capital.

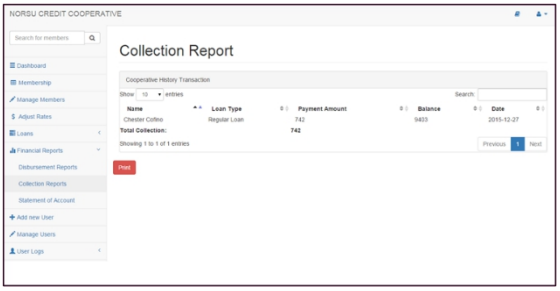


**Figure 10: Collection Report**

Another essential page for creating reports is the statement of the account. This page presents the list of the money that was collected and was disbursed by the cooperative. This gives a list of those members who acquired loans and deposited money to the cooperative.

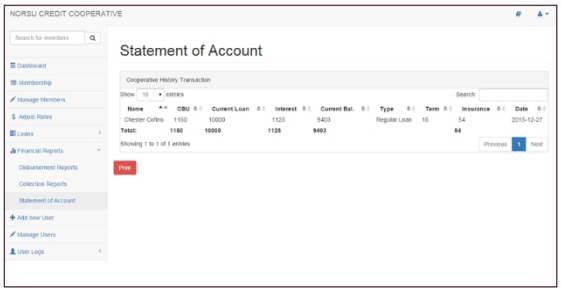


**Figure 11: Statement of Account**

## Maintenance

There are issues and changes in the system, and patches are released to fix those issues. Maintenance is initiated to deliver these changes in the user's environment [7].

## Discussion

The research respondents were the staff and members of a cooperative situated in Negros Oriental, Philippines. The total population of the respondents was one hundred forty (140). The respondents verified the system and rated it based on the usability, sustainability and maintainability, and effectiveness using the ISO/IEC 9126-1 or the Software Evaluation Criteria as an evaluation tool because it is a global standard that supports the development of effective and quality products [8].

## Distribution of Respondents

**Table 3: Respondents**

| Respondents | Frequency | Percentage |
|---|---|---|
| staff | 3 | 2.15 |
| members | 127 | 90.7 |
| IT Experts | 10 | 7.15 |
| **Total** | **140** | **100** |

Below are figures of a Likert Scale used to evaluate usability, sustainability and maintainability, and effectiveness of the system.

**Table 4: Likert Scale for Usability**

| | | **Range Scale (1-4)** |
|---|---|---|
| 1.00 | 1.75 | Not Usable (NU) |
| 1.76 | 2.50 | Slightly Usable (SU) |
| 2.51 | 3.25 | Moderately Usable (MU) |
| 3.26 | 4.00 | Very Usable (VU) |

**Table 5: Likert Scale for Sustainability and Maintainability**

| | | **Range Scale (1-4)** |
|---|---|---|
| 1.00 | 1.75 | Not Sustainable and Maintainable (NSM) |
| 1.76 | 2.50 | Slightly Sustainable and Maintainable (SSM) |
| 2.51 | 3.25 | Moderately Sustainable and Maintainable (MSM) |
| 3.26 | 4.00 | Very Sustainable and Maintainable (VSM) |

**Table 6: Likert Scale for Effectiveness**

| | | **Range Scale (1-4)** |
|---|---|---|
| 1.00 | 1.75 | Not effective (NE) |
| 1.76 | 2.50 | Slightly Effective (SE) |
| 2.51 | 3.25 | Moderately Effective (ME) |
| 3.26 | 4.00 | Very Effective (VE) |

The table below displays the result of the survey on the IT experts in testing the system based on software criteria in terms of usability. There are ten (10) IT experts who are requested to evaluate the system. In addition, the grand mean of the credit management system on usability is 3.80 which result to a very usable system.

**Table 7: Usability of the Credit Management System**

| Criteria | Weighted Mean | Description |
|---|---|---|
| Understandablity | 3.70 | VU |
| Documentation | 3.80 | VU |
| Buildability | 3.90 | VU |
| Installability | 3.90 | VU |
| Learnability | 3.70 | VU |
| **Grand Mean** | **3.80** | **VU** |

Table 8 represents how sustainable and maintainable the credit management system was. The criteria in the table were rated by the IT experts as very sustainable and maintainable. The grand mean is 3.60, which indicates that the system passed the software evaluation of sustainability and maintainability.

**Table 8: Sustainability and Maintainability of the Credit Management System**

| Criteria | Weighted Mean | Description |
|---|---|---|
| Identity | 3.70 | VSM |
| Copyright | 3.70 | VSM |
| Licensing | 3.10 | MSM |
| Governance | 3.30 | VSM |
| Community | 3.60 | VSM |
| Accessibility | 3.60 | VSM |
| Testability | 3.60 | VSM |
| Portability | 3.50 | VSM |
| Supportability | 3.50 | VSM |
| Analyzability | 3.90 | VSM |
| Changeability | 3.80 | VSM |
| Evolvability | 3.80 | VSM |
| Interoperability | 3.80 | VSM |
| Grand Mean | 3.60 | VSM |

The table below shows that the utilization of the credit transactions using the system as rated by the staff and members of the cooperative and got a grand mean of 3.63. This rate indicates that the features of the system in tracking credit transactions are very effective. Most of the respondents rate the system very effective in tracking loan payments, amortization payment, loan balance, capital build-up, interest, and insurance.

**Table 9: Effectiveness of the Credit Management System**

| Items | Weighted Mean | Description |
|---|---|---|
| Loan payments | 3.65 | VE |
| Amortization payment paid | 3.71 | VE |
| Loan Balance | 3.55 | VE |
| Capital build-up | 3.53 | VE |
| Interest | 3.67 | VE |
| Insurance | 3.65 | VE |
| **Grand Mean** | **3.63** | VE |

## Conclusion

The utilization of the system would be used for cooperative offices to help them manage their credit transactions. This would help in tracking, generating reports for the collection, disbursement, and statement of account. The developed system allows the cooperative to accept loan payments, organized loans, manage records, and performed other tasks. Every cooperative need such systems to administer their member accounts and control their credits. The cooperative may need to have also a credit policy in the utilization of the system as to the interest and other processes, which would help increase its members and assets. It is essential to make use of its legal policy in achieving the goals at all administrative and members levels of the cooperative [9].

Lastly, the study did not include other cooperative transactions such as store services, patronage refunds, banking, accounting, and cashiering, as it focused only on the credit processes. Other technology may be used to improve the system. This would upgrade the current features of the developed system.

## References


1. Al-Daouri, Prof. Zakaria Muttlak and Atrach, Belal Khalid, (2020). The Impact of Strategic Intelligence on Strategic Flexibility in Bank Al-Etihad in Jordan. Globus An International Journal of Management & IT, 12(1); 38-45.
2. Alexopoulos, Y., and Silvio, G., (2011). Financial Cooperatives: Problems and Challenges in the Post-Crisis Er. Journal of Rural Cooperation.
3. Alshamrani, A., and Bahattab, A., (2015). A Comparison Between Three SDLC Models Waterfall Model, Spiral Model, and Incremental/Iterative Model. International Journal of Computer Science Issues.
4. Baklizi, M., and Alghyaline, S., (2011). Evaluation of E-Learning websites in Jordan universities based on ISO/IEC 9126 standard. 2011 IEEE 3rd International Conference on

Communication Software and Networks (pp. 71-73), Xi'an, China: IEEE.
5. Beerbaum, D., (2021). Applying Agile Methodology to regulatory compliance projects in the financial industry: A case study research.
6. Brandão, J.B., and Breitenbach, R., (2019). What are the main problems in the management of rural cooperatives in Southern Brazil? Land Use Policy, 121-129.
7. Kipkoech, S.R., (2015). Effect of Credit Management on Firm Profitability: Evidence Savings and Credit Co-Operatives in Kenya. Research Journal of Finance and Accounting.
8. Kule, B.J., Kamukama, N., and Kijjambu, N., (2020). Credit Management Systems and Financial Performance of Savings and Credit Cooperatives (Saccos) in Mid-Western Uganda. American Journal of Finance, 43-53.
9. S. Balaji, and Murugaiyan, D., (2012). Wateerfall vs V-Model vs Agile: A Comparative Study on SDLC. International Journal of Information Technology and Business Management.