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The Creation of a Digital Game to Teach Basic KYC Practices in a Microfinance Setting

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Abstract

Microfinance institutions (MFIs) in the financial industry are required to practice caution when choosing which customers to approve. The Know Your Customer (KYC) process is a set of standards that ensure client authenticity through the collection and assessment of any information necessary to validate their identities and financial backgrounds. This study aims to develop a serious game for KYC training that simulates the process of customer verification and risk assessment within the financial lending industry on a conceptual level. 20 participants were divided into four groups (Video, Game, Hybrid, and Supervisors) and evaluated to see if the game was in any way effective in helping its players learn about the conceptual skills needed in KYC. The results showed a significant improvement in knowledge among those that played the game with only a slight increase in improvement for those who watched a video presentation alongside it. It is recommended that future studies be conducted with those outside the microfinance industry and that further builds of the game be improved upon to make it more accurate and accessible to those who are not familiar with video games in general as it would be beneficial to cater to those that wish to try games as a learning experience.

Keywords: Know Your Customer, Lending, Microfinance, Serious Game, Educational

Introduction

In the money lending industry, "Know Your Customer" (KYC) is a set of standards that ensure client authenticity through the collection and assessment of any information necessary to validate their identities and financial backgrounds [4]. Common practices for KYC include customer due diligence and risk assessment. This is to prevent common issues in the industry such as financial fraud and money laundering from happening as well as helping lenders determine the risk involved in lending money to a particular customer. Although this is a requirement for financial institutions like banks and credit unions overseas, only institutions regulated by the Bangko Sentral ng Pilipinas (BSP) are required to follow these guidelines in the Philippines [5]. As such many private institutions, including Microfinance Institutions (MFIs), choose for themselves whether or not they want to practice KYC.

The process of KYC is defined by the framework that is used for it and although the framework itself depends on the institution implementing it, failure to have properly defined KYC practices means that the decision to approve or deny a loan application is entirely up to the institution's intuition. This lack of security is what leads to cases of money laundering and fraud [6]. Fraud occurs when someone's personal information is used to illegally obtain a loan, forcing the actual person to pay for it while the criminal runs away with the money [7]. Money laundering, on the other hand, focuses more on cleaning dirty money through financial institutions by using them to pay off loans under a false business background [8]. These issues are exactly why KYC is a requirement for major financial institutions and why even private money lending businesses should think about implementing it into their own processes.

The implementation of KYC, however, would be a large undertaking, especially if the business has no prior experience with the set of standards that come with it. Legal requirements such as data privacy and protection dictate what the business will be able to do in terms of KYC protocols [9]. However, the practice of performing physical KYC processes can still be taught to the employees of the business who handle customer relations which could already improve the security of the lending process. Although there are seminars in the Philippines that specialize in performing this training such as the ones held by the Anti-Money Laundering Council of the Philippines, this is only done through a caravan-type information campaign where a business would have to send their employees to scheduled lectures and training sessions [38]. As such, the other option for a financial institution would have to be in-house sessions or online resources for training their employees. Therefore, this study will attempt to provide an alternative to convenient KYC training resources such as video presentations using the medium of video games because of its level of engagement with the learner and flexibility when it comes to the training environment [1], [13], [14].

1) Related Literature

2.1) KYC Requirements

A guide published in 2009 by the International Finance Corporation (IFC) details the documentation requirements for banks regarding Requests for Information (RFIs) [16]. These utilized the Wolfsberg Principle as a standard for best industry practices regarding what information the banks need to collect through KYC and submit to the IFC in the event that an RFI is submitted. The customer information that the Wolfsberg Principles suggests collecting from individual customers include the following:

- Full legal name
- Permanent address
- Date of birth
- Nationality
- Gender
- Occupation
- Employment details (Employer name, business activity, business address)

Along with the standard information, the institutions must also state the customer's other sources of income, the length of the relationship between them and the customer, and the purpose for the transaction which must have a business rationale. Other details such as contact information can be collected for the institution but are not required when submitting documents to the IFC. All of this information is consolidated in the Customer Due Diligence record made for each customer and is used to monitor the transactions as the loan cycle continues [17].

Repco Microfinance, an MFI located in India, outlines their KYC process on their website [18]. The guidelines based on the directions of the Reserve Bank of India indicate that the KYC process for this MFI involves four elements: Customer Acceptance Policy, Customer Identification Procedures, Monitoring of Transactions, and Risk Management. The Customer Acceptance Policy mainly acts as a screening of potential clients with requirements involving being non-anonymous or representatives of companies and firms. This initial layer prevents the customers that are obviously risks to the institutions' interests from receiving a loan. The Customer Identification Procedure then further verifies customer identities after their initial screening. This involves the establishment of a customer account with the following information to be verified:

- Legal name
- Permanent address

These are verified using legal documents such as their passports, voter identification cards, or driver's license. As long as the identification satisfies the MFI in terms of validity, any form of identification can be submitted. Regardless, once a customer is verified and approved of a loan, the MFI begins monitoring the transactions made. Usually, they are looking for certain transactions that are unusually complex or large. As long as they do not exhibit unusual patterns and remain within established thresholds, the loan will continue in its life cycle. Regular records of cash transactions would need to be maintained regularly while any suspicious activities need to be reported immediately. Finally, Risk Management involves the classification of customers as either Low, Medium, or High Risk based on the amount of information available to the institution. Depending on the risk level, more verification may be required to lower it to acceptable levels.

2.2) Serious Game Architecture

A paper written by Mestadi et. al. (2018) proposed an architecture for serious games that was developed by studying previous research regarding serious game design [31]. More specifically, they detailed what challenges and solutions were found in common serious game models and developed classifications that would help create a taxonomy that would aid in developing these types of games from scratch. The architecture itself defines serious games as being composed of three main elements: domain content, game, and learning theories. Each of these elements requires stakeholders that are experienced in different backgrounds of knowledge and creativity in order to design a serious game.

In the book written by Jesse Schell entitled "The Art of Game Design", he breaks down the aspects of good game design into what he calls lenses which give designers multiple perspectives on the way their game is designed. These lenses come in the form of questions that make the designer examine their own work from viewpoints they may never have thought of before. This can help identify flaws or potential opportunities in a game's design. As such this will be an important tool to use when designing the proposed game. There are more than one hundred lenses found in his book and these will be helpful in the design decisions made when creating the game that will be used for this study [40].

Learning theories are meant to act as a way to define the conditions and processes through which a person receives and makes sense of information as well as how they convert that information into new knowledge. According to the Illinois Library, learning theories can be categorized into four general teaching methods: behaviorism, humanism, cognitivism, and connectivism [36].

The degree of effectiveness that these learning theories have also hinges on what type of learners are being taught. The Rasmussen University summarizes these types into 4 categories: Visual, Auditory, Kinesthetic, and Reading/Writing learners [39]. Properly distinguishing the difference between these types of learners can help identify better methods of teaching them as well as provide more insights into the effectiveness of the teaching methods themselves.

2) Methodology

The methodology for this study is composed of three phases: the game design phase, the game development phase, and the testing and evaluation phase.

3.1) Game Design Phase

As the overall goal of the game is to introduce players to the KYC process, the process itself must be clearly defined with designated stages. These stages will be based on Repco Microfinance's own KYC process and will be the basis of the game's main gameplay loop. As such, each level will consist of the following stages which will be played in order:

1) Application Filtering

Loans must be initially filtered according to the company's acceptance policy to avoid bad loans earlier in the process and prevent the company from wasting resources on them (Fig. 1a).

2) Customer Identification and Verification

Customer identities need to be verified via legal identification documents in order to certify that they are who they say they are and that they are capable of paying back what they owe (Fig. 1b).

3) Transaction Monitoring and Risk Management

Although these two are separate steps in Repco's KYC guidelines, they have been combined here in order to enhance the gameplay. Loan payments for each customer are monitored and Customer Due Diligence is practiced through the assessment of each customer's risk. The latter may be determined through the inconsistency of their payments or if they still have a large amount missing from their payments near the deadline. This is when action would need to be taken in the form of sending them a demand letter or dropping their loans and collecting the designated collateral (Fig. 1c).

4) Term Review

This is an additional step added to Repco's guidelines that mainly act as a way for the player to see how they performed during a level. This summarizes the total amount they have spent, the total amount they have earned, the total loans they have completed, the total loans they have dropped, the total demand letters they have used, their current profit goal, and their current budget (Fig. 1d).

Each aspect of the KYC Framework had to be implemented through the three major game elements chosen for this study: Mechanics, Audiovisuals, and Setting. In order to properly translate conceptual KYC skills into a serious game, Jesse Schell's Game Design lenses [40] were used in conjunction with the appropriate learning theory [36] in order to design a game that could teach the player those skills.

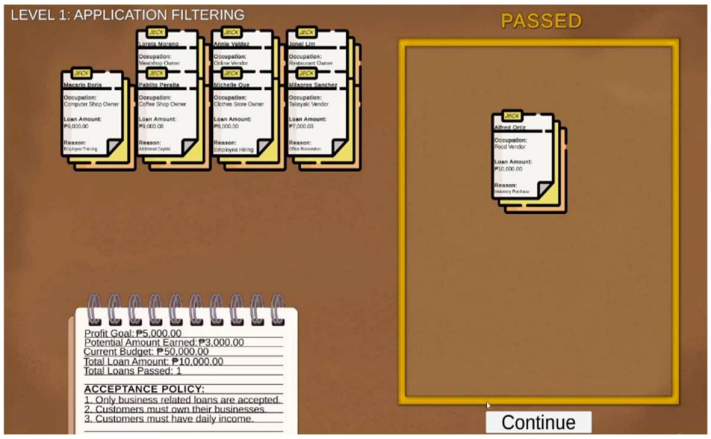

Fig. 1a. Application Filtering

Source: Author's work

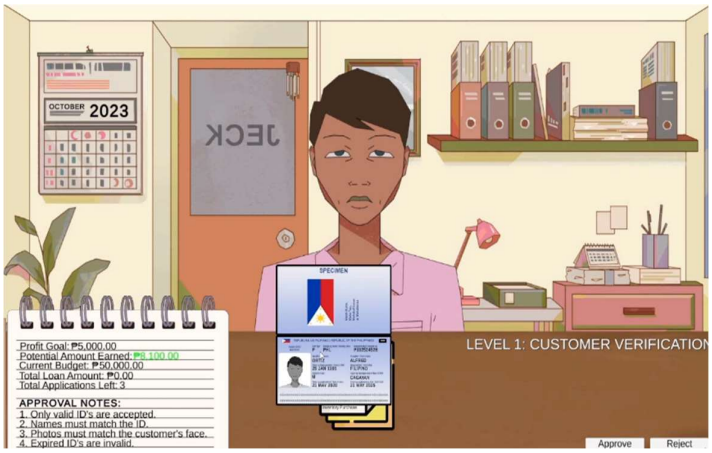

Fig. 1b. Customer Verification

Source: Author's work

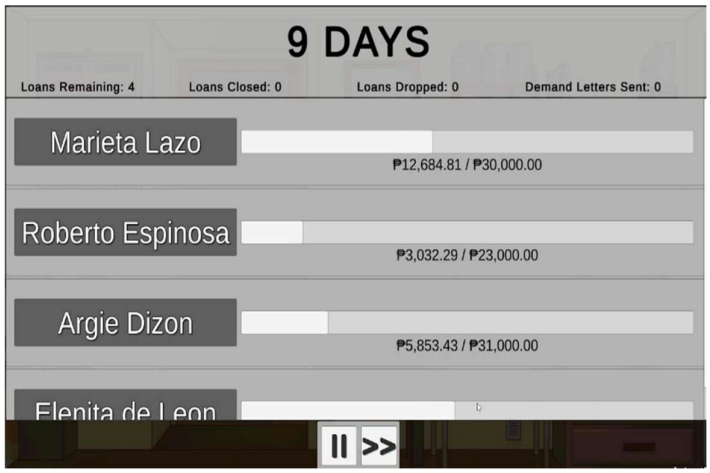

Fig. 1c. Transaction Monitoring

Source: Author's work

Fig. 1d. Term Review

Source: Author's work

3.2) Game Development Phase

The game itself will be developed for personal computers using version 2021.3.x of the Unity engine. Five levels will be developed for the game which will consist of one introductory tutorial level and four actual test levels that increment in difficulty. The controls will primarily make use of a mouse and keyboard. Assets for the game will primarily be sourced from royalty-free sites such as itch.io, freesound.org, and the Unity asset store. These assets, which include sounds, visuals, and UI, will be modified as needed. As previously stated, these assets are not intended to be representative of a final product and are mainly used to facilitate the learning process.

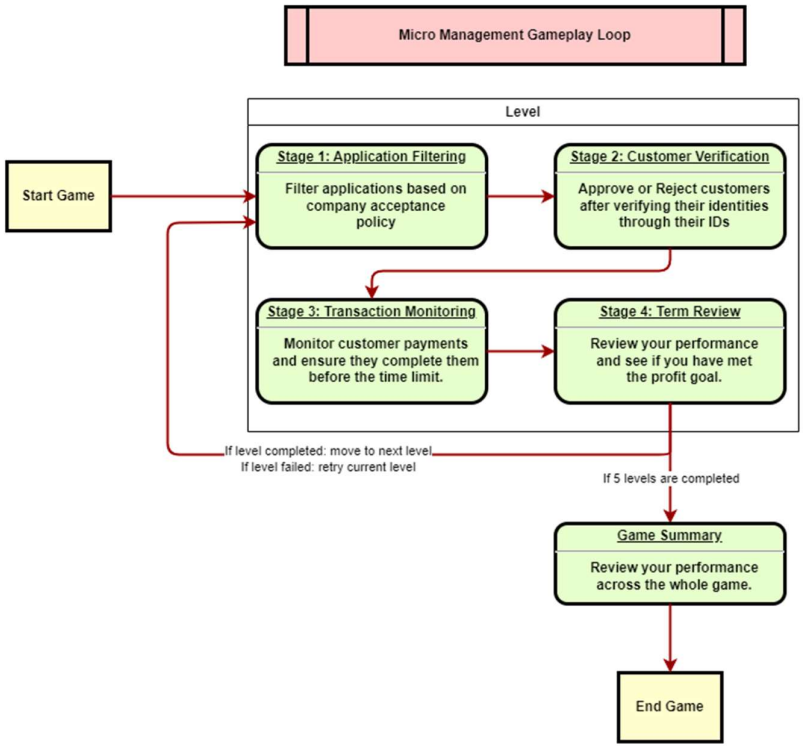

Fig. 2. Gameplay Loop

Source: Author's work

Taking the 4 step KYC framework, it was divided into 4 stages which make up a single level (Fig. 2). When all four of these stages are completed in order, the player will have managed to complete that level. The level is only considered complete if the amount of money that the player earned is equal to or greater than the profit goal set for that level which increases along with the difficulty as the player progresses. Should they not meet this goal, they are still given the option to retry that particular level. The overall goal of the game is to complete 5 levels and if they do so, a summary for their overall performance will be presented.

The decisions the player makes during stage 1 and 2 can positively or negatively affect the progression of payments in stage 3. Therefore, the player is encouraged to carefully scrutinize applications and identification documents during the former stages in order to make their 3rd stage much easier to manage. The objective of the 3rd stage itself is just to monitor each loan and take action should they be falling behind in payments through the demand letter and dropping options.

3.3) Testing and Evaluation Phase

Once a test-ready version of the game has been developed, the evaluation process can begin. The respondents will be composed of 5 supervisors and 15 employees of the Rojumicro Lending Corporation, the latter of which will be divided into a video, game, and hybrid group with 5 members each. The video group will mainly focus on learning KYC through an informational video [41] while the game group will learn KYC through the game developed for this study. The hybrid group will utilize both mediums to learn KYC and will mainly use the developed game as a supplement to the video. The supervisors will be another separate group that will evaluate the game only because of their previous experiences with practices similar to KYC.

Although this microfinance institution does not have any clearly defined frameworks for KYC processes, they do have generalized methods of customer verification during their loan application process. Before the actual evaluation, each participant will answer an assessment that will determine their learner type in order to provide more insights into the results at the end of the study.

All participants will be given a pre-learning questionnaire to answer before the actual learning process. The latter will be followed by a post-learning questionnaire which would be compared against its pre-learning counterpart to see if the learning process had any impact or changes in their answers.

The questions asked in these questionnaires are either Likert scale questions to measure their degree of agreement or familiarity or open-ended questions that allow them to freely express their thoughts. It was decided that these two types of questions would best fit a conceptual skill test as it was more important that they retained the idea of the KYC process rather than being able to name the specific and interchangeable terms associated with it.

In order to summarize the changes between the pre-learning and post-learning questionnaires, each paired set of questions was given a difference score that corresponded to the change in answers. These are the following:

1: Positive Change

This is characterized by positive shifts in the Likert scale questions and more specific or correct answers as well as more examples for open ended questions.

0: No Change

This is characterized by equivalent values for the Likert scale questions and the same or similar answers for open ended questions.

-1: Negative Change

This is characterized by negative shifts in the Likert scale questions and less specific or wrong answers as well as less examples for open ended questions.

The following are examples of the answers given by the participants and their corresponding difference scores in order to further illustrate how each answer was rated.

1: Positive Changes

How often does KYC need to be performed?

Pre-Learning: 4

Post-Learning: 5

What are the common baseline requirements for loan applications?

Pre-Learning: Valid ID's

Post-Learning: National ID, Driver's License, Voter's ID, Barangay ID

What does KYC aim to prevent?

Pre-Learning: To avoid scams

Post-Learning: To avoid fraud, corruption, money laundering, and double accounts

0: No Changes

How often does KYC need to be performed?

Pre-Learning: 5

Post-Learning: 5

What are the common baseline requirements for loan applications?

Pre-Learning: PSA Birth certificate, Government IDs

Post-Learning: PSA Birth certificate, Government IDs

What does KYC aim to prevent?

Pre-Learning: To prevent fake customer identities

Post-Learning: Prevents fake customers

-1: Negative Changes

How often does KYC need to be performed?

Pre-Learning: 5

Post-Learning: 3

What are the common baseline requirements for loan applications?

Pre-Learning: Government ID, Barangay clearance

Post-Learning: Proof of identity

What does KYC aim to prevent?

Pre-Learning: To prevent double accounts, fake, and multiple accounts

Post-Learning: Fake account

3) Results

Once all learning questionnaires were reviewed and the average of their difference scores are calculated, they were summed up to represent the amount of change that occurred from the pre-learning to the post-learning questionnaire. This was performed for all participants of each group and the results of each group are as follows:

Table 1. Group Comparison Results

Group Comparison	
Group	**Average Difference Score**
Video Group	1.8
Game Group	9
Hybrid Group	10
Supervisor Group	6.4

Source: Author's work

From the group comparison table (Table 1), it can be seen that the Hybrid Group had the most beneficial learning process out of all the groups with the Game group being behind them by one point. The lower scores do not necessarily mean that the participants of those groups did not learn anything from their learning experience since it might have only reaffirmed their current knowledge regarding KYC. None of the participants also have any negative scores as each of them either already knew the contents of the learning process or learned something new.

During the learning process, it was observed that the participants were more engaged with the game than the video as those who watched the video were completely silent as they viewed it while those that were playing the game occasionally clapped or gasped when they completed a level while making slight remarks or insults when customers were falling behind in their payments during the 3rd stage.

Although it was never coded in, they were also making theories on why those loans were failing to pay their debts in time. From their experiences, particular occupations such as vendors or online salespeople did not have a good track record when it came to paying their dues. It was interesting to see these experiences make their way into how they chose their loans in the game even though it is not actually a game mechanic.

Additionally, each participant's learner type also provided more insights into how they learn through the game. Visual learners were observed to mistake the tutorial windows of the game as actual game objects that they could manipulate with multiple cases of them attempting to click the retry or quit buttons on the screen that explains the Term Review stage. Although, there are no other discernible patterns observed based on their difference scores.

Because all the supervisor participants had significant experience in the microfinance industry, an additional questionnaire asked them to state which game elements were most effective in representing the process of KYC: mechanics, audiovisuals, or setting. The questionnaire itself was divided into three sections with each one representing one of the three game elements that were the focus of development and asked them to pick out aspects of the game that stood out to them.

Table 2. Game Aspects and Number of Mentions

Game Aspects	**Mentions**
Mechanics	
Application Filtering	1
Customer Verification and Processing	4
Audiovisuals	
Customer IDs	4
Level Markers	1
Time Limit Marker	2
Timer Signal Sounds	1
Level Completed Sound	1
Setting	
Business Rules	2
Challenges	3
Business Goals	2
Business Rewards	2
Office Environment	2

Source: Author's work

Overall, the supervisors agreed that these aspects aided their corresponding game elements with most of them stating the Customer Verification process as the most accurate in representing its real-life counterpart. Most of them mentioned the act of scrutinizing customer identification documents as similar to what they perform in real life. This was further aided by the difference in appearance for those with a fake ID. The only suggestions they gave in terms of feedback is to add more customer occupations to be more accurate to the occupations they encounter in the field (Table 2).

Every participant who had played the game was also given an additional questionnaire that asked them about their experience with the game. The questionnaire itself was divided into the same three sections. Most participants who have played the game agree that the mechanics of the game are what kept them engaged and wanted to play more. This may be due to limiting their tries to 3 lives in order to prevent the evaluation from taking too much time which motivated them to try their best. Furthermore, they were also observed to be comparing how far they made it across the 5 levels with each other. Out of the 15 participants who played the game, only 5 of them managed to clear all 5 levels without losing all their lives with 3 of them being supervisors. Although it should be noted that the difference in mentions between the two runner-up game elements is slight as others noted the comfortability of the setting or the positive auditory and visual feedback as other forms of motivation.

Table 3. Game Elements and Number of Mentions

Game Elements	Mentions
Mechanics	8
Audiovisuals	3
Setting	4

Source: Author's work

Observing how the participants play the game, they were seen to be able to understand the game's mechanics easily due to their prior knowledge on loans (Table 3). This helped when some of the participants completely skipped the tutorial windows due to their uninterest. This meant that a majority of them chose loans on gut feeling rather than careful scrutiny. One participant even managed to clear all 5 levels through sheer luck in their loan selections.

The 3rd stage in particular received the most engagement as it allowed the participants to formulate their own risk management strategies. Some were waiting to see how the customers' payments progressed by the 50th day before sending demand letters while others were only sending them after the 100 days. Those that failed and had to retry their levels also attempted to change up their strategy by sending demand letters early to customers who had a low rate or frequency of payment.

In terms of unused aspects of the game, none of the participants used the fast-forward feature of the transaction monitoring stage as all of them preferred to watch the progress of each loan in real time. Only a few of them used the pause button as time would stop anyway if they opened the customer's details window. None of them went over budget in stage 1 even though that would give them more options when selecting loans in stage 2. The pause menu, including its contents like the options and credits, were never used as all of them stuck primarily to mouse controls only, using the keyboard solely to enter the name of their loan business.

4.1) Conclusion and Recommendations

In conclusion, this study designed and developed a conceptual Know Your Customer training game called "Micro Management" that aimed to be a sufficient KYC teacher in the field of microfinance. The KYC framework used helped divide each level into 4 digestible stages (Application Filtering, Customer Verification, Transaction Monitoring, and Term Review). The most representative of those stages was the Customer Verification stage as that was seen as the most accurate to its real-life counterpart.

20 participants were divided into four groups (Video, Game, Hybrid, and Supervisors) and evaluated to see if the game was in any way effective in helping its players learn about the conceptual skills needed in KYC. The results showed a significant improvement among those that played the game with only a slight difference between those that played the game by itself and those that watched the video presentation alongside it. They also stated that they were encouraged to continue playing due to the mechanics of the game rewarding them for choosing their loans correctly.

Because all of the participants of this study are involved with the microfinance industry, it is recommended that further studies be conducted with those who are unfamiliar with the industry as they may show even more changes in knowledge after playing the game. It is also recommended that further builds of the game be improved upon to make it more accurate and accessible to those who are not familiar with video games in general as it would be beneficial to cater to those who wish to try video games as a learning experience.

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