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IS 350 Final Project: Designing a Simulated Automatic Teller Machine for a Bank

Introduction

A simulated ATM should be able to offer clients with money withdrawal and depositing services in real-time. The entire system should efficiently allow the customer to withdraw or deposit cash provided that they enter the correct pin and their withdrawal is within the set minimum and specified denomination (multiples of \$20). The main aspects of the ATM are the customer interface components, keyboard, and display, which will facilitate interaction, cash dispenser, a section for depositing cash in envelopes, a printer for printing client receipts, and a key that will enable the operator to start or stop the ATM.

Major Project Features (BRD)

1. The ATM card reader that will accept specific card belonging to the bank while rejecting the ATM card not associated with the bank. Therefore, the card reader scans the magnetic stripe to verify the information on the debit card. The main aim is to show that the debit bank is associated with the bank.
2. The keyboard which is part of the interface and allows the customer to enter the information needed for them to access their accounts. Such information includes the PIN and amount to deposit or withdraw. Accordingly, the keyboard should offer the 'enter or accept' and 'cancel' points for incorrect and correct information entered respectively.
3. The monitor or display which is part of the customer console and enables the user or customer to view the displayed status and operational information. This includes the amount entered in currency, the status of the bank account in term of balance, and the denominations in which the customer can withdraw the cash.

4. The bills of storage which mainly stores notes in multiples of \$20. The notes are transferred to the cash dispenser when the transaction is verified by the system.
5. Cash dispenser is an output slot of the ATM machine which delivers the amount requested by the customer after successful verification of the current transaction.
6. Depositing slot that enables the customer to insert the amount they need to deposit in their bank account.
7. A printer which is an internal device linked to the monitor or display and system database. The printer provides customers with printed receipts that indicate a summary of the transaction made.
8. System Database that entails an internal centralized data storage which is connected to the ATM by the bank's server. Access of this database is facilitated by the scanning of the card's magnetic stripe and verification of the PIN entered. Such access verifies card validity and other information in the database such as current balance, withdraw limits, and credentials of the cardholder (Wang & Zhang, 2010).

Scope of the Project (FSD)

The aim of this project is to design an ATM system which is reliable, maintainable and effective (Tilley & Rosenblatt, 2017). Reliability focusses on the ability of the ATM to handle human mistakes such as wrong PIN or amount entry, processing errors such as failure to remit the cash, hardware failures, and input errors such as entry of the wrong amount. Maintainability entails the ability of the ATM system to undergo modifications in an easy and flexible way especially when there are changes in user requirements. Lastly, effectiveness related to how the ATM system supports the requirements of the business while satisfying the needs of the customer.

In order to facilitate greater and exceptional interaction of the use or customers with the ATM, the following aspects should be considered during the design process. In this case,

the project aims at providing a high degree of system usability in the form of the effectiveness of the system, the satisfaction of the customer, and the support of the ATM for business functions.

1. Maintaining the Ease of Understanding and Using the ATM

In this case, the main focus is on having a display and input that offers commands, system response, and actions that are foreseeable and consistent. This includes clearly labeling of the input buttons and controls (Tilley & Rosenblatt, 2017). Accordingly, the customer should be able to navigate easily on the monitor or display while filling the required information. The ATM system will also feature some short-cuts for the users who are experienced in order to avoid multiple levels of entering information. For instance, the display will show various amounts to withdrawn.

2. Provision of Instant Feedback and Help

In designing the ATM system, the display should offer help in the form of shortcuts, errors, procedures, and menu choices. Users should be able to easily return to the initial step or point especially when they make a mistake or the system encounters an error. Contact information including 24/7 telephone number, Twitter, Facebook, or email needs to be included to enable users to seek instant help. User confirmation prompts such as 'Are you sure?' need to be integrated into the system to prevent unplanned cancellation of the transaction. Any communication messages should be displayed in a consistent and logical way on the screen (Tilley & Rosenblatt, 2017). The system should also alert the customer in cases where there is a delay in processing the payment and provide average waiting time. Transactions update such as 'successful withdrawal or deposit', 'transaction canceled', 'invalid key', and others should be to indicate wither success or failure of the process.

3. Designing a Layout that is Attractive

In the ATM design, the sizes, styles, and fonts of the displayed information should be standardized in terms of color and concentration to enhance visibility and easy understanding. The use of bright colors will be avoided to minimize distraction. The density of the ATM's display screen to be orderly with sufficient white spaces in order to enhance readability and attractiveness. Command terminologies such as BACK, CANCEL, and ACCEPT should be consistent and also offer the same results across the transaction process. For example, if CANCEL command enables the user to input the details again, this should be consistent throughout the process. The system should use terms that are easy and mostly applied in the daily business environment rather than technical and complex terms (Tilley & Rosenblatt, 2017).

4. Enhancing the Interface

The interface of the ATM entailing features on the display or monitor such as text boxes, menu bars, option buttons, command buttons, and toggle buttons should be designed in a way that eases customer navigation (Tilley & Rosenblatt, 2017). The arrangement of these features should be done in a way that will help starters and eliminate their confusion.

Software Development Method

The bank will have to undertake in-house development of the software in order to design an ATM that fulfils the unique needs of the customers, eliminate or minimize the related modifications and adjustment in internal policies and procedures of the bank, to full address constraints faced by the bank's current system, as well as enhance its internal capabilities and resources (Tilley & Rosenblatt, 2017). The in-house operators of the bank need to enhance their capabilities in order to constantly and effectively handle any changes, errors and mistakes identified. Accordingly, the in-house development approach will enable the bank to adjust to any changes in technology aimed at improving the operations of the ATM.

Conclusion

In designing the ATM, it is paramount to consider effective communication. In this case, communication entails the target group, the message, the rationale of the message, time and place of communication, and ways in which the message will be conveyed. For this design, communication will entail the approaches to system installation operational evaluation, test environments, and post-implementation activities (Tilley & Rosenblatt, 2017).

Testing should show how the ATM is functioning after installation and identify errors that may hinder customers. Testing will offer syntax errors related to grammar issues and logic errors that will show incorrect results like incorrect amount discharged. The testing will be done by the IT experts who will work as a team to identify possible areas, apply the necessary quality principles, and verify the ATM to demonstrate how it fulfills the needs of the customers. At this point, unit testing will enable the team to identify and remove execution errors that can cause abnormal termination of a transaction as well as missed logic errors. Accordingly, system testing will entail verification of the entire ATM system to assure customers, the bank, and designers that the ATM has fulfilled all the specifications and successfully integrated the needed features.

System testing as one of the post-implementation activity will show if the ATM can handle both correct and incorrect information entered by the customer. The testing will ensure that the operators of the ATM have the correct documentation with instructions to start and stop the ATM as well as well-functioning restart and backup abilities (Tilley & Rosenblatt, 2017). The testing will also show that the customer can successfully interact with the system.

References

- Tilley, S., & Rosenblatt, H. (2017). *Systems Analysis and Design*. Boston: Cengage Learning.
- Wang, Y., & Zhang, Y. (2010). The formal design model of an Automatic Teller Machine (ATM). *International Journal of Software Science and Computational Intelligence*, 2(1), 102-131.