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SNHU CS255

6-3 Interpreting UML

The diagrams describe a use case for withdrawing cash from an ATM.

In the **UML Activity Diagram**, the process begins with the user verifying their PIN. If the PIN is incorrect, the system prompts for the PIN again. Once the correct PIN is entered, the user is asked for the withdrawal amount. If the amount is available, the cash is dispensed, a receipt is generated, and then printed for the user, marking the end of the transaction.

The **UML Sequence Diagram** details the interactions between the User, the ATM, and the Bank during a cash withdrawal. The user starts the process by entering their card, which prompts the ATM to ask for the PIN. The entered PIN is sent to the Bank for verification. If the PIN is valid, the user is then asked for the withdrawal amount. The amount is processed by the ATM, which triggers the Bank to dispense cash through the ATM. The sequence ends with the ATM dispensing the cash to the user.

The information being passed back and forth includes the user's card details, PIN number, requested amount for withdrawal, and the confirmation of the PIN validity and transaction success from the Bank to the ATM, which finally results in cash being dispensed and a receipt being printed.

Deficiencies:

**Handling of Incorrect PIN Entries**:

* + **Deficiency**: The activity diagram allows for an endless loop of 'Wrong PIN' entries without any consequence or limit.
  + **Improvement**: Introduce a counter for the number of incorrect PIN attempts. If the PIN is entered incorrectly a certain number of times (typically three), the system should seize the card or lock the account temporarily to prevent fraudulent access.

**Verification of Account Balance**:

* + **Obverdraft**: The sequence diagram lacks a step where the ATM checks the account balance before dispensing cash. This could result in an overdraft if the account does not have sufficient funds, potentially allowing user to withdraw far more than is available.
  + **Improvement**: Add a step where, after the PIN is verified and the amount is entered, the ATM sends a request to the bank to check if the account balance is sufficient for the withdrawal amount. If the balance is insufficient, the transaction should be cancelled and the user should be informed accordingly.

A screenshot of a diagram

Description automatically generated