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Interpreting UML Diagrams

The provided UML activity diagram and UML sequence diagram both describe the use case of withdrawing money from the ATM. Both depict how the information of the user's PIN and the desired withdrawal amount are passed back and forth in the system, as well as the interactions that enable this. The activity diagram lays out the steps that are performed in order to complete a withdrawal while the sequence diagram shows the interactions between the system's objects that occur during a withdrawal.

In the activity diagram, the system starts by verifying the user's PIN, ending the use case if an incorrect PIN is received. After a correct PIN is received the ATM asks for an amount for the withdrawal. If the user has at least this much money available, then the ATM will dispense the cash and generate and print a receipt. If the user does not have enough money, then the ATM skips the dispense cash step and generates and prints a receipt for the failed withdrawal attempt.

In the sequence diagram, the use case begins with the user entering their card and being asked for a PIN by the ATM. The user then provides the ATM with a PIN, which is then sent to the Bank for verification. Once the Bank verifies the PIN, it sends this information back to the ATM, which then asks the user for an amount to withdraw. The user then provides the ATM with an amount and the ATM dispenses that amount of cash to the user.

One deficiency in the functionality laid out by these two diagrams comes in the handling of incorrect PINs. In the activity diagram, the use case ends if an incorrect PIN is entered while in the sequence diagram it is not even accounted for. This could be improved by updating the diagrams to show how the system would allow for two more attempts after an incorrect PIN, followed by temporarily blocking that card's access. Another deficiency in the functionality of

this design is the lack of updating of the user's bank account following a withdrawal. This is an extremely important interaction to include because without it, the user would simply be given free money without the amount actually being deducted from their account. This can be accounted for in the activity diagram by adding a new activity of updating the user's account after dispensing the cash. This can be accounted for in the sequence diagram by adding another interaction between the ATM and the Bank of updating the user's account after dispensing the cash.

Reconstructed UML Activity Diagram

ATM Withdrawal Activity Diagram

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