

ATM Project Handout 3.1

Use Case Report: Withdraw Cash

Version 1.0

Introduction

This is an example of what a use case report might look like. There is much more detail in the use-case report than there was in the step-by-step outline that was the first draft of the use case.

In this example, we show the report as it might appear in the middle of developing it. There are still mistakes in the report, which we point out in our comments.

There are many styles of writing use cases. We show one style here, based on the template and guidelines for a use-case report in the Rational Unified Process.

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Revision History

Date	Version	Description	Author
15/03/2000	3.1a	Revised format for RUP 2000	J. Bell

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Use Case Report: Withdraw Cash

1. Use Case Name: Withdraw Cash

1.1 Brief Description

This use case describes how a Bank Customer uses an ATM to withdraw money from his/her bank account.

2. Flow of Events

2.1 Basic Flow

1. Insert Card

This use case begins when the Bank Customer inserts a Bank Card in the card reader on the ATM machine. The ATM validates the card.

2. Enter PIN

The ATM asks for the customer PIN code. The Bank Customer enters the PIN code. The ATM verifies the PIN.

3. Select 'Withdraw Cash'

The ATM displays the different alternatives that are available on this unit. The Bank Customer selects "Withdraw Cash".

4. Enter Account and Amount

The ATM asks for account to withdraw from and amount to withdraw. The Bank Customer enters account and amount.

5. Debit Bank Account

The ATM sends the card id, PIN, amount and account to the Bank Consortium. The Bank Consortium replies that the transaction is accepted. The ATM system reports to the Bank Customer that it is ready to dispense cash.

6. Print Receipt

The ATM asks the Bank Customer if a receipt is desired. The Bank Customer requests a receipt. The ATM system prints the receipt.

7. Receive Cash and Card

The ATM system dispenses money to the Bank Customer, and returns the Bank Card. The use case ends.

2.2 Alternative Flows

2.2.1 Not a valid card

In Step 1, Insert Bank Card, of the basic flow, if the card is not valid it is ejected to the Bank Customer with a "sorry not a valid card" message. The use case ends.

2.2.2 Wrong PIN

In Step 2, Enter PIN, of the basic flow, the PIN is wrong. The ATM displays the message "wrong PIN" to the Bank Customer. The Bank Customer has three tries to get it right. If the Bank Customer correctly enters the PIN, the basic flow resumes at Step 3. Otherwise the card is kept by the machine and the use case terminates.

2.2.3 Card stuck in card reader while reading card

In Step 1, Insert Bank Card, when the magnetic strip is read, the card gets stuck. An alarm is then sent to the maintenance crew and the Bank Consortium. The local video camera starts recording. The ATM

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displays a warning message to the Bank Customer. The use case ends.

2.2.4 Amount requested requires denominations not available

In Step 4, Enter Account and Amount, of the basic flow, if the Bank Customer enters an amount that can't be 'created' with the denominations of bills contained in the ATM, then the machine will display a warning message showing the kinds of bills are available, and ask the Bank Customer to reenter the amount. The basic flow is resumed at step 4. This can be done over and over again until the Bank Customer enters a amount that is OK.

2.2.5 Amount requested is more than money available

In Step 4, Enter Account and Amount, of the basic flow, if the Bank Customer enters an amount that is more than the amount of money contained in the ATM, then the machine will display a warning message showing the current maximum amount that can be dispensed at the ATM, and ask the Bank Customer to reenter the amount. The basic flow is resumed at step 4. This can be done over and over again until the Bank Customer enters a amount that is OK.

2.2.6 Not enough money in account

In Step 5, Debit Bank Account, of the basic flow, if the Bank Consortium replies to the ATM that there is not enough money in the Bank Customer's bank account, the ATM sends the Bank Customer an error message "Sorry not enough money in account". The ATM continues at Step 4, Enter Account and Amount, of the basic flow.

2.2.7 No account

In Step 5, Debit Bank Account, of the basic flow, the Bank Consortium indicates the card is valid but there is no account connected to the card.

What to do? Should we eject the card or keep it? Is it an error in the Bank Consortium? Or is it a forgery? Or a old card that was connected but the account has expired?

[This is a typical way to use Use Cases. You may write your questions right down in the text - and when you get your answers you have to correct it. Or you may assume one way - either the reviewers like it or they tell you how it should be]

2.2.8 Wrong account

In Step 5, Debit Bank Account, of the basic flow, the Bank Consortium indicates the card is valid but the Bank Customer specified an account that does not exist. The result will be an error message "Sorry wrong account" and the Bank Customer has to restart in Step 4 of the basic flow.

2.2.9 No contact with Bank Consortium

In Step 5, Debit Bank Account, of the basic flow, if the ATM cannot contact the Bank Consortium then the ATM displays a message to the Bank Customer that the connection to the Bank Consortium was lost and 'Try again later', the Bank Card is returned, and the use case ends.

2.2.10 No printed receipt requested

In Step 6, Print Receipt, of the basic flow, if the Bank Customer does not request a printed receipt, no receipt is printed. The basic flow resumes at Step 7, Receive Cash and Card,

2.2.11 Out of money in ATM machine

In Step 7, Receive Cash and Card, of the basic flow, if there is no money left in the machine, then the ATM will display a warning message - this ATM is out of money. (Normal limit is \$500.) The use case ends.

[Does the description of the normal limit belong in this alternative flow?]

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2.2.12 Error when dispensing cash

In Step 7, Receive Cash and Card, of the basic flow, each bill that is dispensed to the Bank Customer has to be validated with a 'Money reader.' If this unit does not accept the bill - drop it in the 'waste basket', and dispense the next bill.

Another error is that some bills get stuck in the interface. The amount that was dispensed OK, is registered in the log record.

An alarm is sent to the maintenance crew and to the closest bank branch.

If all bills left in the ATM are validated as faulty, then the actual dispensed amount shall be registered in the log. A new debit transaction is sent to the Bank Consortium. This transaction is also registered in the log record. Then the ATM is closed down while waiting for the acknowledge of this last transaction - (There is no point in keeping the machine open - there is no money left.)

[Can you understand the description of this alternative flow: what the condition is for starting the alternative flow, what the actor does, what the ATM does, and where to resume the basic flow?]

[Does the description of this alternative flow include details that are not externally visible?]

2.2.13 Card stuck in card reader while ejecting

In Step 7, Receive Cash and Card, of the basic flow, or in the Quit Alternative Flow, the card gets stuck. The ATM may just try to eject the Bank Card for 2 minutes. If it still can't eject the Bank Card, then it has to be kept by the ATM. An alarm is then sent to the maintenance crew and the Bank Consortium. The local video camera starts recording. The ATM displays a warning message to the Bank Customer. The use case ends.

Whoops – on the Use-Case Diagram did we show that the Maintenance Crew is an actor for this use case? Also, is it technologically possible for the ATM to send a message the maintenance crew? We should check on this.

2.2.14 Money never removed from tray

In Step 7, Receive Cash and Card, of the basic flow, if the dispensed money is still there after 30 seconds an attention sound is turned on.

If the money is still there after 55 seconds then it is retracted and placed in the wastebasket. This has to be written to the log. The attention sound is turned off. The use case ends.

2.2.15 Card never removed from card reader

In Step 7, Receive Cash and Card, of the basic flow, if the card is still there after 30 seconds an attention sound shall be turned on.

If the card is still there after 55 seconds it is retracted and placed in the wastebasket. This has to be written to the log. Then the attention sound is turned off. The use case ends.

2.2.16 Log full

After Step 7, Receive Cash and Card, of the basic flow, if the log can't register one more transaction, then the ATM shall be closed down and a warning will be sent to the Maintenance crew.

2.2.17 Breakin

If, at any time during the use case, any of the ATM's shell protection sensors are activated, then the video camera begins recording, and an alarm is sent to the Police. All current data is written to the log record.

This log record is also sent to the Bank Consortium. The card is kept by the ATM. The current transaction is terminated. The use case terminates.

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2.2.18 Quit

The Bank Customer can anytime during the use case decide to quit. The transaction is stopped. If the ATM has already transmitted its request to the Bank Consortium, then the ATM sends a new message to the Bank Consortium to abort this transaction. The ATM records the aborted transaction in its log.

The Bank Card is ejected. The use case terminates.

2.2.19 No reply from User

If, at any time during the use case, the system asks for input from the Bank Customer and (s)he doesn't reply within 30 seconds - then a warning sound will beep.

If there still is no reply for 25 more seconds, then this operation will be closed down and the ATM will put the card in the wastebasket. This will be registered on the log. The use case ends.

2.2.20 Power off

If, at any time during the use case, the power goes down, then all activities are frozen and the card is mechanically ejected. If the ATM is in the process of dispensing money, the money dispenser just stops. The log record tells how many bills were already dispensed.

When the power comes back up, all partially dispensed bills are put in the internal wastebasket. The ATM notifies the Bank Consortium to synchronize the last withdraw. The ATM issues a warning message that the Bank Customer must visit the bank to finish receiving the cash. The use case ends.

2.2.21 Internal error

If, at any time during the use case, the system goes down during processing of a cash withdraw then a warning message is issued to the user, the card is ejected and the use case terminates. The system is closed down.

If the system is down, how can it issue a warning? Maybe we need to re-think this.

3. Special Requirements

3.1 Time to process card

The ATM shall respond within .5 seconds after the Bank Customer inserts the card in the Card Reader.

3.2 Reliable Cash dispensing

The ATM shall dispense the correct amount of cash in 99.9% of the requested cash withdrawals.

3.3 Standard Card Format

The ATM shall recognize all Bank Cards that have magnetic strips encoded in Bank Association Standard format.

4. Pre-Conditions

4.1 Bank Customer has a card

The Bank Customer must have a bank card in order to begin this use case.

4.2 ATM contains cash

The ATM must have cash available in the machine in order to begin this use case.

4.3 ATM has connection to Bank Consortium

The ATM must have a connection to the Bank Consortium in order to begin this use case.

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5. Post-Conditions

5.1 Card return

At the end of this use case, either the Bank Customer will have their bank card returned or the bank card will be kept and the Bank Customer will be notified of where it will be sent.

5.2 Accounts balanced

At the end of the use case, all account and transaction logs are balanced, and communication with the banking system is reinitialized.

6. Extension Points

None specified for this use case.

7. Relationships

The Actor starting this Use Case is:

Bank Customer

Actor(s) also involved in this Use Case:

Bank Consortium

Maintenance crew

Police alarm central

8. Use Case Diagrams

None specified for this use case.

9. Other Diagrams

None specified for this use case.