
Sample Bank ATM

Sample Bank ATM Use-Case Specification: Withdraw Cash¹

Version <1.0>

¹ Bittner and Spence, USE CASE MODELING, pp. 301-330, © 2002 Pearson Education Inc. Reproduced by permission of Pearson Education, Inc. All rights reserved.

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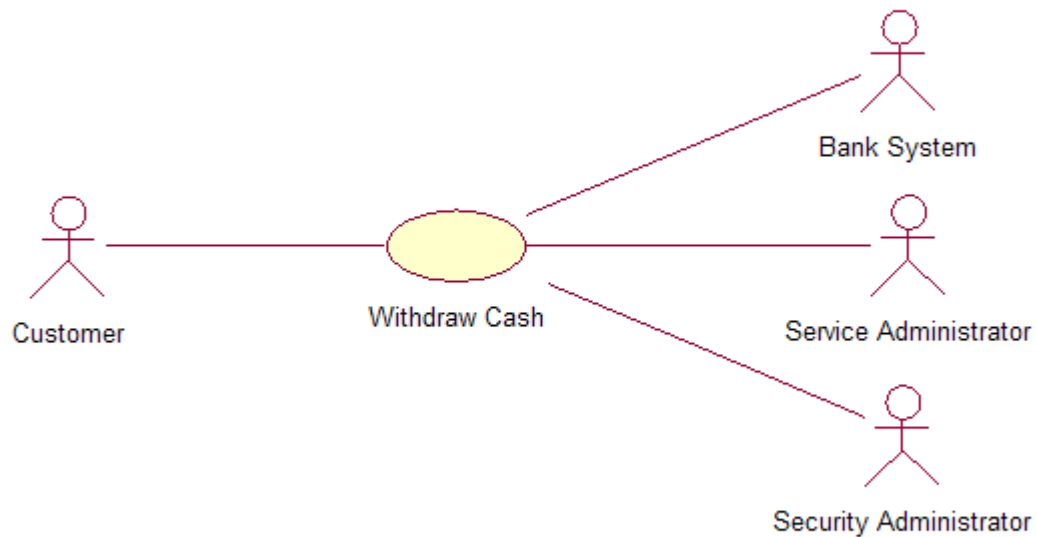
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Use-Case Specification: Withdraw Cash

1. Brief Description

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

2. Use-Case Diagram



3. Preconditions

- The bank Customer must possess a **bank card**.
- The network connection to the **Bank System** must be active.
- The system must have at least some cash that can be dispensed.
- The cash withdrawal **service option** must be available.

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4. Basic Flow of Events

4.1 Insert Card

The use case begins when the actor **Customer** inserts their **bank card** into the card reader on the ATM.

The system allocates an **ATM session identifier** to enable errors to be tracked and synchronized between the ATM and the Bank System.

4.2 Read Card

The system reads the **bank card information** from the card.

4.3 Authenticate Customer

Perform Subflow *Authenticate Customer* to authenticate the use of the **bank card** by the individual using the machine.

4.4 Select Withdrawal

The system displays the **service options** that are currently available on the machine.

The Customer selects to withdraw cash.

4.5 Select Amount

The system prompts for the amount to be withdrawn by displaying the list of **standard withdrawal amounts**.

The Customer selects an amount to be withdrawn.

4.6 Confirm Withdrawal

Perform Subflow *Assess Funds on Hand*

Perform Subflow *Conduct Withdrawal*

4.7 Eject Card

The system ejects the Customer's **bank card**.

The Customer takes the **bank card** from the machine.

4.8 Dispense Cash

The system dispenses the requested amount of cash to the Customer.

The system records a **transaction log** entry for the withdrawal.

4.9 Use Case Ends

The use case ends.

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5. Alternative Flows

5.1 Customer Authentication

5.1.1 Handle No Communications with the Bank System

At the **Validate Card Information** step of Subflow *Authenticate Customer* if the Bank System cannot be contacted or does not reply within the set **communication time out period**,

- 1 If the communications link has failed more times than the **communication retry number**, then the authentication attempt is abandoned and Basic Flow is resumed at **Use Case Ends**.
- 2 The system will attempt to contact the Bank System until it has completed the number of retry attempts indicated by the **communication retry number**.
- 3 If communications is re-established the Basic Flow is resumed at **Authenticate Customer**.
- 4 If there is still no response from the Bank System the system creates an **event log** entry to record the failure of the communications link to the Bank System. The **event log** entry includes the type of failure.
- 5 The system sends the **event log** to the **Service Administrator** to inform them that communications with Bank System has been lost.
- 6 Resume the Basic Flow at **Use Case Ends**.

5.1.2 Handle No Communications with the Customer's Bank

At the **Validate Card Information** step of Subflow *Authenticate Customer* if the Bank System reports that the **Customer's Bank** cannot be contacted,

- 1 The system creates an **event log** entry to record the fact that the **Customer's Bank** was unavailable. The **event log** entry includes the **bank card information** (excluding the **PIN**).
- 2 The system informs the Customer that communications with their Bank is not possible and that the Customer should try again later.
- 3 Resume the Basic Flow at **Use Case Ends**.

5.1.3 Handle Inactive Card or Account

At the **Validate Card Information** step of Subflow *Authenticate Customer* if the **Customer's Bank** reports that the card, or its associated **account**, are inactive,

- 1 The system creates an **event log** entry to record the fact that the Customer's account was inactive. The **event log** entry includes the **bank card information** (excluding the **PIN**).
- 2 The system informs the Customer that the account associated with the card is not active and that the Customer should contact their Bank for more information.
- 3 Resume the Basic Flow at **Use Case Ends**.

5.1.4 Handle Stolen Bank Card

At the **Validate Card Information** step of Subflow *Authenticate Customer* if the Bank System reports that the card has been stolen:

- 1 The system
 - a. Confiscates the card.
 - b. Captures a 10-second video image of the Customer.
 - c. Creates an **event log** entry to record the fact that a stolen card has been used. The **event log** entry includes the video image and the current **bank card information** (excluding the **PIN**).
 - d. Sends the **event log** entry to the Security Administrator, the Bank System and the Service Administrator to inform them that a stolen card is being used.

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- e. Continues to videotape the Customer.
- 2 The system delays for 5 minutes indicating that the system is busy (the system should try to keep the Customer at the machine for as long as possible).
- 3 After the delay the system reports to the Customer that
 - The card has been confiscated
 - He or she should contact their bank if they have any questions.
- 4 The system stops the video and creates an **event log** entry to store the captured images. The **event log** entry includes the video image and the current **bank card information** (excluding the **PIN**).
- 5 Resume the Basic Flow at **Use Case Ends**.

5.1.5 Handle Invalid Bank Card Information

At the **Validate Card Information** step of Subflow *Authenticate Customer* if the Bank System reports that the **bank card information** is not valid,

- 1 The system
 - a. Captures a 10-second video image of the Customer.
 - b. Creates an **event log** entry to record the fact that the card information was invalid. The **event log** entry includes the video image and the current **bank card information** (excluding the **PIN**).
 - c. Sends the **event log** entry to the Security Administrator, the Bank System and the Service Administrator to inform them that a card with invalid **bank card information** is being used.
- 2 The system reports to the Customer that
 - The card could not be read
 - He or she should contact their bank if they have any questions.
- 3 Resume the Basic Flow at **Use Case Ends**.

5.1.6 Handle Correct PIN Not Entered

At the **Validate Card Information** step of Subflow *Authenticate Customer* if the **PIN** has not been entered correctly,

- 1 The system informs the Customer that the **PIN** has been entered incorrectly
- 2 If the Customer has made fewer than three attempts at entering the **PIN**, the system informs them that they can make another attempt.
- 3 If this is the Customer's third attempt, the system
 - a. Confiscates the card.
 - b. Captures a 10-second video image of the Customer.
 - c. Creates an **event log** entry to record the fact that the Customer failed to enter the correct **PIN** number in three attempts. The **event log** entry includes the video image and the current **bank card information** (excluding the **PIN**).
 - d. Sends the **event log** entry to the Bank System and the Service Administrator to inform them that a Customer's **bank card** was confiscated because of the Customer failed to enter the **PIN** correctly.

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- 4 The system reports to the Customer that
 - The card has been confiscated because the **PIN** number was not entered correctly.
 - He or she should contact the **Service Organization** to retrieve the card
 - He or she should contact their bank with any questions.
- 5 Resume the Basic Flow at Use Case Ends.

5.2 Specialist Withdrawal Facilities

5.2.1 Handle the Withdrawal of a Non-Standard Amount

At the Select Amount step of the Basic Flow if the Customer requires a non-standard amount,

- 1 The system asks the Customer for the required amount indicating that the amount entered must be a multiple of the **smallest denomination note held** and must be below the amount of ATM's **withdrawal limit** and the amount of currency held by the machine.
- 2 The Customer enters the desired amount.
- 3 The use case resumes the Basic Flow from Confirm Withdrawal.

5.3 Card Handling

5.3.1 Handle Card Jam

At the Insert Card steps of the Basic Flow, the Eject Card step of the Basic Flow and Alternative Flows, or at the Retrieve Card step of the Handle Card Left Behind by Customer Alternative Flow, if the **bank card** jams in the card reader,

1. Emergency Eject Card

The system attempts to eject the card.

If the card ejection is successful,

- a. The system informs the Customer,
 - i. That the card may be faulty
 - ii. That he or she should contact their Bank to get a replacement card
 - iii. That he or she should take the **bank card** from the machine
- b. The Customer takes the **bank card** from the machine.
- c. The use case resumes the Basic Flow at Use Case Ends.

2. Emergency Confiscation

If the emergency ejection fails the system attempts to retrieve the card and add it to the **confiscated cards**.

If the card retrieval is successful, the system,

- a. Captures a 10-second video image of the Customer.
- b. Creates an **event log** entry to record the fact that a card has been retained because it became stuck in the card reader. The **event log** entry includes the video image and the current **bank card information** (excluding the **PIN**) if it is available.
- c. Sends the **event log** entry to the Bank System and the Service Administrator to inform them that a card has been retained because it became stuck in the card reader.
- d. Informs the Customer that the card cannot be returned because of a technical error and that they should contact the **Service Organization** for the return of their card.

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3. **Card Jammed**

If the card could not be ejected or retrieved, the system,

- a. Captures a 10-second video image of the Customer.
- b. Creates an **event log** entry to record the fact that a card is jammed in the card reader. The **event log** entry includes the video image and the current **bank card information** (excluding the **PIN**) if it is available.
- c. Sends the **event log** entry to the Bank System and the Service Administrator to inform them that a card has become jammed in this ATM.
- d. Informs the Customer that the card cannot be returned because of a technical error and that they should contact the **Service Organization** for the return of their card.

If the card is still jammed the system performs Subflow *Service Shutdown* to shutdown all **service options** and end the use case.

5.3.2 *Handle Unreadable Bank Card*

At the **Read Card** step of the Basic Flow if the system cannot read all the **bank card** information,

1. The system captures a 10-second video image of the Customer.
2. The system creates an **event log** entry to record the fact that the card could not be read. The **event log** entry includes the video image and any **bank card information** (excluding the **PIN**) that it managed to read.
3. The system informs the Customer that the card cannot be read and that they should contact their bank to have the card checked.
4. **Eject Card**
 - a. The system ejects the Customer's **bank card**.
 - b. The Customer takes the **bank card** from the machine.
5. The use case resumes the Basic Flow at **Use Case Ends**.

5.3.3 *Handle Invalid Card*

At the **Read Card** step of the Basic Flow if the system does not support the **financial institution** associated with the card or cannot identify the **financial institution** associated with card,

- 1 The system captures a 10-second video image of the Customer.
- 2 The system creates an **event log** entry to record the fact that an attempt was made to use the ATM using an invalid card. The **event log** entry includes the video image and the **bank card information** (excluding the **PIN**).
- 3 The system informs the Customer that the card cannot be used in this ATM.
- 4 **Eject Card**
 - a. The system ejects the Customer's **bank card**.
 - b. The Customer takes the **bank card** from the machine.
- 5 The use case resumes the Basic Flow at **Use Case Ends**.

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5.3.4 Handle Card Left Behind By Customer

At the **Eject Card** step of the Basic and Alternative Flows or at the **Emergency Eject Card** step of the Handle Card Jam Alternative Flow if the **bank card** is not removed from the ATM within 30 seconds, The system beeps to alert the Customer.

If the card has still not been removed within a minute of the alert being sounded then the system,

1. **Retrieve Card**

Retrieves the card and adds it to the **confiscated cards**.

2. **Adjust the Account Balances**

If there are still funds to be dispensed then the system performs Subflow **Handle Transaction Adjustments** to put the money back into the **account** because it will not now be dispensed.

3. **Record the Event**

The system creates an **event log** entry to record the fact that the card was left behind in the ATM. The **event log** entry includes the **bank card information** (excluding the **PIN**).

The system sends the **event log** entry to the Bank System and the Service Administrator to inform them that the card has been left in the ATM.

The system turns off the alert.

The use case resumes the Basic Flow at **Use Case Ends**.

5.4 Receipt Handling

5.4.1 Offer Receipt Handling to the Customer

At the **Select Withdrawal** step of the Basic Flow if the ATM is not out of paper,

- 1 The system offers the Customer the facility to have a receipt printed for the transaction.
- 2 The Customer indicates whether they want a receipt.
- 3 The use case resumes from the place where it was interrupted.

5.4.2 Withdraw the Receipt Facility

At the **Select Withdrawal** step of the Basic Flow if the ATM is out of paper or the paper is jammed,

- 1 The system informs the Customer that the facility to have a receipt printed for the transaction is currently unavailable.
- 2 The use case resumes from the place where it was interrupted.

5.4.3 Handle the Printing of Receipts

At the **Dispense Cash** step of the Basic Flow if a receipt was requested,

- 1 The system prints a **withdrawal receipt**.
- 2 If the ATM does not have sufficient paper to print the receipt or the printer jams, the system
 - a Creates an **event log** entry to record the fact that the receipt printing is out of order. The **event log** entry includes the **bank card information** (excluding the **PIN**).
 - b Sends the **event log** to the Bank System and the Service Administrator to inform them of the failure and its reason (out of paper or paper jam)
 - c Informs the Customer that the receipt cannot be printed

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- d Displays the **withdrawal receipt** information to enable the Customer to take a manual record of the transaction.
 - e Asks the Customer to acknowledge that the receipt information has been displayed.
 - f Displays the receipt information for two minutes or until it is acknowledged by the Customer.
- 3 The system beeps to alert the Customer that the receipt information is available.
 - 4 The use case resumes from the place where it was interrupted.

5.5 Error Handling

5.5.1 Handle Authentication Failures

At the **Authenticate Customer** step of the Basic Flow if the **bank card** is not authenticated, then

- 1 Unless the card has been deliberately retained the card is returned to the Customer:

Eject Card

- a The system ejects the Customer's **bank card**.
 - b The Customer takes the **bank card** from the machine.
- 2 The use case resumes the Basic Flow at **Use Case Ends**.

5.5.2 Handle the Bank Not Approving the Withdrawal

At the **Validate the Withdrawal** step of the Subflow *Conduct Withdrawal* if the Bank System responds with a **withdrawal rejection**, then

- 1 If the Bank System rejected the withdrawal because there were not enough funds in the **account**, the system informs the Customer that the withdrawal has been rejected because the **account** does not have sufficient of funds
- 2 If the Bank System rejects the withdrawal for any other reason, the system
 - a. Informs the Customer that the withdrawal has been rejected by the **Customer's Bank**
 - b. Advises them to contact their Bank for further details
- 3 The system records a **transaction log** entry for the transaction including the reason given for the transactions rejection.
- 4 The use case resumes the Basic Flow at **Select Withdrawal**.

5.5.3 Handle Cash Dispensing Errors

At the **Dispense Cash** step of the Basic Flow if the full amount cannot be dispensed (notes might be rejected by, or get stuck in, the counting and dispensing device), then

- 1 The system creates an **event log** entry to record the fact that there has been a dispensing error. The **event log** entry includes the **bank card information** (excluding the **PIN**) and the details of the cause of the dispensing error.
- 2 The system sends the **event log** entry to the Service Administrator and the Bank System to inform them that the ATM is no longer able to dispense cash.
- 3 The system disables the withdraw-cash **service option**.
- 4 The system records a **transaction log** entry for the transaction including both the amount that should have been dispensed and the amount that was actually dispensed.

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- 5 Perform Subflow *Handle Transaction Adjustments* to balance the ATM and the Bank System.
- 6 The use case resumes the Basic Flow at Use Case Ends.

5.5.4 Handle Money Left Behind By Customer

At the Dispense Cash step of the Basic Flow if the cash is not removed from the ATM within 30 seconds,

- 1 The system beeps to alert the Customer.
- 2 If the cash has still not been removed within a minute of the alert being sounded, then the system
 - a. Retrieves the cash checking the amount that has been left behind.
 - b. Creates an **event log** entry to record the fact that cash has been left uncollected. The **event log** entry includes the **bank card information** (excluding the **PIN**), the amount of cash retrieved and the amount of cash dispensed.
 - c. Records a **transaction log** entry for the transaction including both the amount that should have been taken and the amount that was actually taken.
 - d. Performs Subflow *Handle Transaction Adjustments* to balance the ATM and the Bank System
 - e. Turns off the alert.
- 3 The use case resumes the Basic Flow at Use Case Ends.

5.5.5 Handle Running Out Of Critical Resources

At Use Case Ends if the system does not have the capacity to log any more events or log any more transactions then,

- 1 Perform Subflow *Service Shutdown* to shutdown all **service options** and end the use case.

5.5.6 Handle Running Out of Cash

At Use Case Ends if the system has no more funds to dispense,

- 1 The system removes Withdraw Cash from the list of available **service options**.
- 2 The system creates an **event log** entry to record the fact that the ATM has run out of cash.
- 3 The system sends the **event log** entry to the Service Administrator and the Bank System to inform them that the ATM is no longer able to dispense cash.
- 4 The use case resumes from the place where it was interrupted.

5.5.7 Handle Security Breaches

At any time when an attempt to gain physical access to the currency dispenser is detected,

- 1 The system starts to videotape the Customer.
- 2 The system creates an **event log** entry to record the fact that the ATM has detected an attack
- 3 The system sends the **event log** entry to the Security Administrator, the Service Administrator and the Bank System to inform them that the ATM is being attacked.
- 4 If the card has not yet been ejected, the card is confiscated.
- 5 If a withdrawal has been approved but the cash has not yet been dispensed, the transaction is cancelled.

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- 6 The system creates an **event log** entry to record the actions taken. The **event log** entry includes the **bank card information** (excluding the **PIN**).
- 7 The system sends the **event log** entry to the Security Administrator, the Service Administrator and the Bank System to inform them what action has been taken.
- 8 If a transaction was cancelled, then
 - a. The system records a **transaction log** entry for the transaction including both the amount that should have been dispensed and the amount that was actually dispensed.
 - b. Perform Subflow *Handle Transaction Adjustments* to balance the ATM and the Bank System.
- 9 The Customer is informed that the card has been confiscated and the transaction ended.
- 10 The system saves the video recording with the **session ID**
- 11 The use case resumes the Basic Flow at **Use Case Ends**.

5.5.8 Handle the Customer Quitting the Session

At any time, if the Customer elects to quit the session,

1. **Tidy Up the Session**

The system stops the current transaction.

If the Customer quits after a withdrawal has been authorized but before the cash has been dispensed, then the system

- a. Records a **transaction log** entry for the transaction including both the amount that should have been dispensed and the amount that was actually dispensed.
- b. Performs Subflow *Handle Transaction Adjustments* to balance the ATM and the Bank System

2. **Eject Card**

- a. The system ejects the Customer's **bank card**.
- b. The Customer takes the **bank card** from the machine.

The use case resumes the Basic Flow at **Use Case Ends**.

5.5.9 Handle the Customer Stopping Responding

At any time where a response from the Customer is requested, if no response is made within 30 seconds (this does not include removing the card or the cash when they are dispensed as these are explicitly handled by their own flows)

- 1 The system beeps to alert the Customer.
- 2 If there is still no reply within a minute of the alert being sounded, then the system
 - a. Confiscates the card.
 - b. Creates an **event log** entry to record that the card has been confiscated. The **event log** entry includes the **bank card information** (excluding the **PIN**).
 - c. Sends the **event log** entry to the Bank System to inform the Customer's bank that the card has been confiscated.
 - d. If the event happens after a withdrawal has been authorized but before the cash has been dispensed, then the system

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- I. Records a **transaction log** entry for the transaction including both the amount that should have been dispensed and the amount that was actually dispensed.
 - II. Performs Subflow *Handle Transaction Adjustments* to balance the ATM and the Bank System
 - e Turns off the alert.
- 3 The use case resumes the Basic Flow at **Use Case Ends**.

5.5.10 Handle Video Recording Failure

At any point in the flow of events where video is being recorded, if the video capture device fails or there is insufficient storage for the video images,

- 1 The system creates an **event log** entry to record the failure of the video system. The **event log** entry includes the type of failure (video storage full or video device failure).
- 2 The system sends the **event log** entry to the Service Administrator and the Bank System to inform them that the video system has failed.
- 3 The system turns off the video device to await the maintenance engineer. There is no need to disable the ATM because all functions can continue without the video being active.
- 4 The use case resumes from the point that the failure was detected.

5.5.11 Handle Transaction Log Failure

At any point in the flow of events where a **transaction log** is being recorded, if the log cannot be stored,

- 1 The system creates an **event log** entry to record the fact that **transaction log** has failed. The **event log** entry includes the current **bank card information** (excluding the **PIN**).
- 2 The system sends the **event log** entry to the Bank System and the Service Administrator to inform them that the transaction log is out of order.
- 3 If the event happens after a withdrawal has been authorized but before the cash has been dispensed, then the system
 - a. Sends the **transaction log** entry to the Bank System to cancel the withdrawal.
 - b. Creates an **event log** entry to record the fact that the transaction has been cancelled. The **event log** entry includes the current **bank card information** (excluding the **PIN**), the fact that the transaction was a withdrawal and the amount of the withdrawal.
- 4 The system informs the Customer that because of a technical problem their request cannot currently be fulfilled.
- 5 **Eject Card**
 - a. The system ejects the Customer's **bank card**.
 - b. The Customer takes the **bank card** from the machine.
- 6 Perform Subflow *Service Shutdown* to shutdown all Customer services and end the use case.

5.5.12 Handle Event Log Failure

If at any point in the use case the **event log** fails the use case will continue to completion without logging any events. At the end of the use case, the Customer services will be shutdown (see Handle Running Out of Critical Resources). For the details of how event log failures are handled by the system see the Supplementary Specification.

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5.6 Handle the Bank System Stopping Responding

At the **Validate the Withdrawal** step of the Subflow *Conduct Withdrawal* if the Bank System cannot be contacted or does not reply within the set **communication time out period**,

1. Attempt to Re-establish Communications

- a. If the communications link has not failed, during this use case, more times than the **communication retry number** then the system will attempt to contact the Bank System until it has completed the number of retry attempts indicated by the **communication retry number**.
- b. If communication is re-established the flow is resumed at the **Validate the Withdrawal** step of the Subflow *Conduct Withdrawal*.

2. Cancel the Withdrawal

- a. If there is still no response from the Bank System the system creates an **event log** entry to record the failure of the communication link to the Bank System. The **event log** entry includes the type of failure.
- b. The system sends the **event log** to the Service Administrator to inform them that communication with Bank System has been lost.
- c. The system records a **transaction log** entry for the transaction including the fact that the withdrawal was not authorized because of loss of communications with the Bank System.
- d. The system informs the Customer that the withdrawal has been rejected because the Bank System cannot be contacted.

3. Eject Card

- a. The system ejects the Customer's **bank card**.
- b. The Customer takes the **bank card** from the machine.

4. Resume The Basic Flow

The use case resumes the Basic Flow at **Use Case Ends**.

5.6.1 Handle Loss of Connection to the Security Administrator or the Service Administrator

If at any time the system attempts to contact the Security Administrator or the Service Administrator and fails, the use case will still continue to completion. For the details of how these generic communications failures are handled by the system, see the Supplementary Specification.

6. Subflows

6.1 Authenticate Customer

1. Validate Card Information

- a. The system sends the **bank card information** to the **Bank System** to confirm that the **bank card** and its associated **account** are active, that the card has not been reported stolen and that the **bank card** information (including the **PIN**) read from the **bank card** is valid.
- b. The system also sends the **ATM ID** and the **ATM session identifier** to the Bank System along with the **bank card** information.
- c. The Bank System acknowledges that the **bank card** information is valid and that the card can be used.

2. Validate User Identity

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- a. The system prompts the Customer to enter the **PIN**.
 - b. The Customer enters their **PIN**.
 - c. The system checks that the **PIN** entered is identical to the PIN read from the **bank card**.
3. The flow of events resumes at the next step.

6.2 Assess Funds on Hand

1. The system determines whether it has sufficient funds on hand to dispense the requested amount.
 3. The system checks to see if the total amount requested is greater than the amount on hand.
 4. The system checks to see if the requested amount can be dispensed with the denominations on hand.

Note: It is possible to have sufficient funds in total and still be unable to dispense funds. Consider the case where the Customer has requested \$35 but the system has only \$40 in the form of two \$20 bills.
2. If there are not sufficient funds on hand, the system
 - a. Informs the Customer that the amount requested is not available from the ATM
 - b. Offers the Customer a choice of the nearest available amount (s). If the amount requested was rejected because the correct denomination notes were not available, then both the nearest amounts below and above that requested are offered. If the amount requested was rejected because it was higher than the amount of fund available, then the nearest amount below that requested is offered.
3. The Customer selects an amount to be withdrawn.
4. The flow of events resumes at the next step.

6.3 Conduct Withdrawal

1. **Validate the Withdrawal**
 - a. The system supplies the Bank System with the **bank card** information, the amount of the requested withdrawal, the **ATM Session Identifier** and the **transaction fee** and asks it to approve the withdrawal.
 - b. The Bank System responds with a **withdrawal acceptance** to approve the withdrawal.
2. **Log the Authorization**

The system records a **transaction log** entry for the authorized withdrawal including the information that the cash is still to be dispensed.
3. **Return to Performing Flow**

Resume at the next step.

6.4 Service Shutdown

1. The ATM displays the fact that it is out of order and that no **service options** are available.
2. The system turns off the card reader to prevent the insertion of any more cards.
3. The system creates an **event log** entry to record the fact that the system has switched off all Customer services. The **event log** entry includes the time of the of service shutdown. If the recording of the event log fails, the system just ignores it.
4. If they are still contactable, the system sends the **event log** entry to the Service Administrator and the Bank System to inform them that the ATM is out of order. If they are not available, the system continues to attempt to inform them of the current state of the system.
5. The use case ends.

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6.5 Handle Transaction Adjustments

- 1 The system calculates the adjustment required by the Banking System for this withdrawal by subtracting the amount of cash dispensed from the amount approved for withdrawal.
- 2 The system informs the Bank System of the amount of the adjustment also specifying the **bank card information**, and the **ATM Session Identifier**.
- 3 The Bank System accepts or rejects the adjustment.
- 4 The system records a **transaction log entry** for the adjustment indicating whether the transaction was accepted or rejected and including the Bank System's response.
- 5 Resume at the next step.

7. Key Scenarios

7.1 Success Scenarios

Withdraw cash – Basic Flow

Withdraw cash of a non-standard amount – Basic Flow, Alternative Flow: Handle the Withdraw of a Non-Standard Amount

Withdraw cash with withdrawal receipt printed – Basic Flow, Alternative Flow: Handle the Printing of Receipts

7.2 Failure Scenarios

Fail due to authentication failure – Basic Flow, Alternative Flow: Handle Authentication Failures

Fail due to invalid card – Basic Flow, Alternative Flow: Handle Invalid Card

Fail due to insufficient funds in the account – Basic Flow, Alternative Flow: Handle the Bank Not Approving the Withdrawal

Fail due to cash dispensing errors – Basic Flow, Alternative Flow: Handle Cash Dispensing Errors

Fail due to card jam – Basic Flow, Alternative Flow: Handle Card Jam

Fail due to inadequate critical resources – Basic Flow, Alternative Flow: Handle Running Out of Critical Resources

Fail due to non-responding bank system – Basic Flow, Alternative Flow: Handle the Bank System Stops Responding

Quit – Basic Flow, Alternative Flow: Handle the Customer Quitting the Session

8. Postconditions

- The ATM has returned the card and dispensed the cash to the Customer and the withdrawal is registered on the Customer's account.
- The ATM has returned the card to the Customer and no withdrawal is registered on the Customer's account.
- The ATM has returned the card but has not supplied the amount of cash registered as withdrawn from the Customer's account. The discrepancy is registered in the ATM's log.
- The ATM has kept the card, no withdrawal has registered on the Customer's account and the Customer has been notified where to contact for more information.

9. Extension Points

None

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10. Special Requirements

10.1 Reliable Cash Dispensing

The ATM shall dispense the correct amount of cash in at least 99% of cash withdrawals.