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(Sample)

Use-Case Model Survey

For an Automated Teller Machine (ATM)

Handout 1

Introduction

This set of suggested solutions on the classical ATM problem are inspired from Swedish, American, Australian and Canadian ATM systems. We that have been writing this example have never built a real ATM system. We have just used our knowledge as ATM customers and general system knowledge. The point of this set of solutions is to show what a solution may look like, and to what level of detail you describe the use cases. A lot of the ideas in this example come from a course in Australia with some developers that actually built bank applications.

Beware that this is not a real system.

The point here is not the technical content but what the descriptions may look like.

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1. Introduction

This is an example of what a solution to the use case exercises in the RMUC course may look like. It contains more information than what a normal group may create. It is closer to an example of a use-case model for a regular project. Keep in mind that this example shows the use-case model in the beginning of a project.

2. Survey Description

The Automated Teller Machine (ATM) is a remote unit connected to the bank computer systems. The purpose of the system is to bring regular bank services closer to the customer and increase the working hours to around the clock. It is also important to decrease the amount of bank cashiers. An ATM withdraw is less expensive for the Bank than a withdraw from a teller.

3. Actors

3.1 Diagram

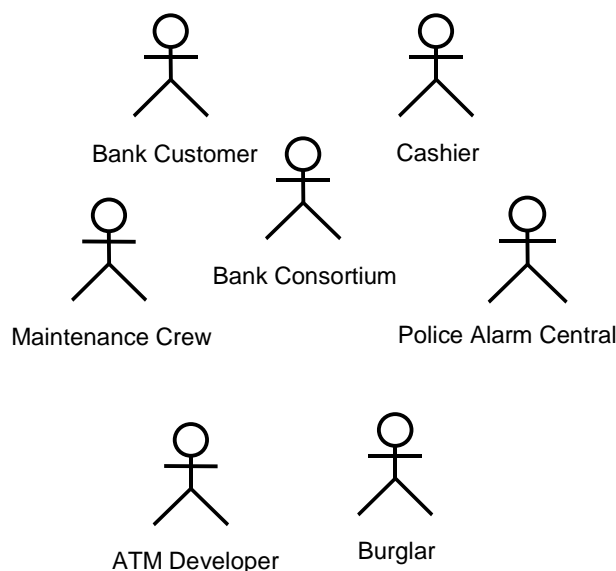


Figure 1. Actor Diagram

3.2 Bank Customer

A person with a valid Bank Card. The Bank Card is theirs and they know the PIN Code.

3.3 Bank Consortium

A Bank Consortium that provides services to the ATM. Responsible for verifying Bank Customers, authorizing transactions and recording completed transactions. The Bank Consortium makes it possible for Bank Customers in different banks to use the same ATM.

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3.4 Maintenance Crew

The Maintenance crew is responsible for maintaining the Automated Teller Machine, refilling paper and replenishing Cash On Hand when needed.

3.5 Police Alarm Central

Receives automatic alarms from the ATM when something is going wrong - that is somebody is trying to do something illegal with the ATM.

3.6 Cashier

From the ATM system point of view, the Cashier's only responsibility is to receive notification that money has been deposited in the security box of a particular ATM. Later, the cashier will count the money and verify all deposits.

3.7 ATM Developer

The team responsible for adding new functionality to the ATM.

3.8 Burglar

The person that tries to break into the ATM to get the money or just to vandalize the ATM.

4 Use Cases

4.1 Primary Cases

4.1.1 Diagram of Use Cases around the Bank Customer

See Figure 2

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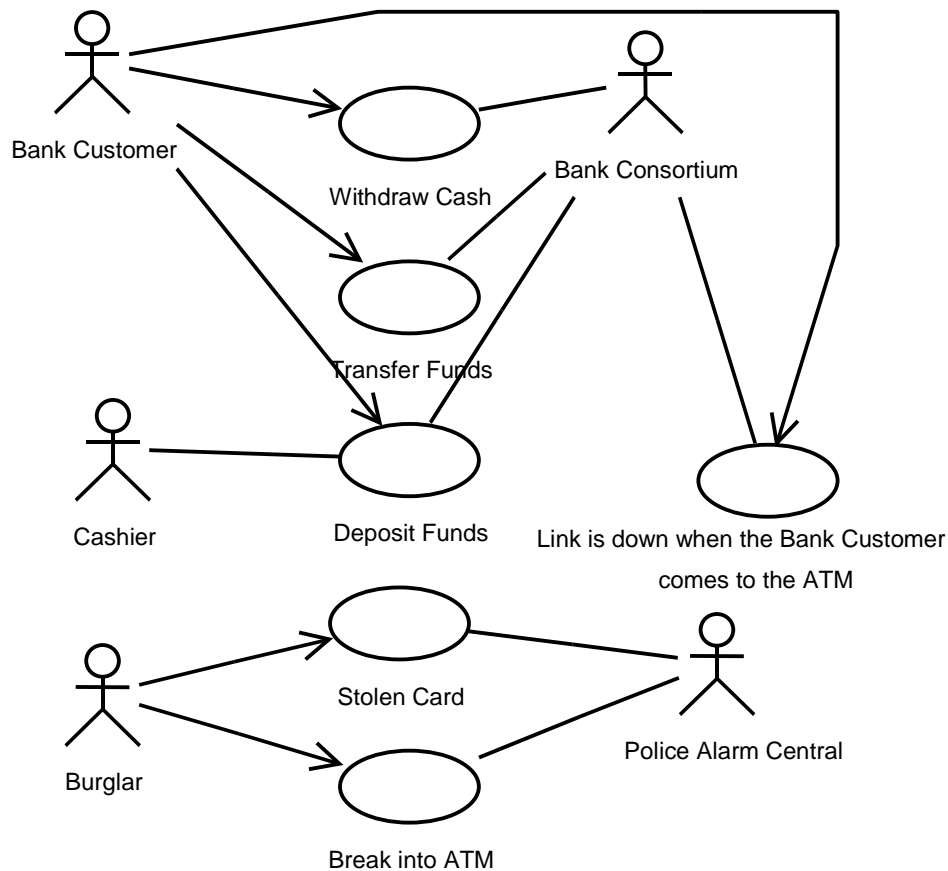


Figure 2. Diagram of Use Cases around the Bank Customer

4.1.2 Withdraw Cash

The Bank Customer withdraws money from their bank account with the ATM, using a Bank Card.

4.1.3 Transfer Funds

The Bank Customer transfers money between the cardholder's different accounts using an ATM.

4.1.4 Deposit Funds

The Bank Customer deposits money into an account. Bills or checks are accepted. The Bank Customer puts the money in an envelope and inserts the envelope into the ATM. All envelopes are stored in a special safety box in the ATM. The money is counted the next day.

4.1.5 Link is down when Bank Customer comes to the ATM

The ATM has to monitor the connection to the Bank Consortium. If the link goes down the machine will try to contact again.

[This is a typical example of a Use Case that exists in the beginning of a project but usually is removed later on.]

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4.1.6 Break into an ATM

This is abuse of the ATM. The way the world is today we have to design the ATM's behavior in this case too.

4.1.7 Stolen card

If a card is reported as stolen, the card is kept by the ATM. The police will be informed, and the video camera registers the person at the machine. The machine will try to keep the person at the machine as long as possible (to make it possible for the police to get him). The responsible bank will be informed and they are responsible for telling the actual account owner about this.

[Both 4.1.6 and 4.1.7 are other examples of Use Cases at the beginning of a project that are removed later on.]

4.2 Secondary cases

4.2.1 Diagram of Support and Maintenance Use Cases

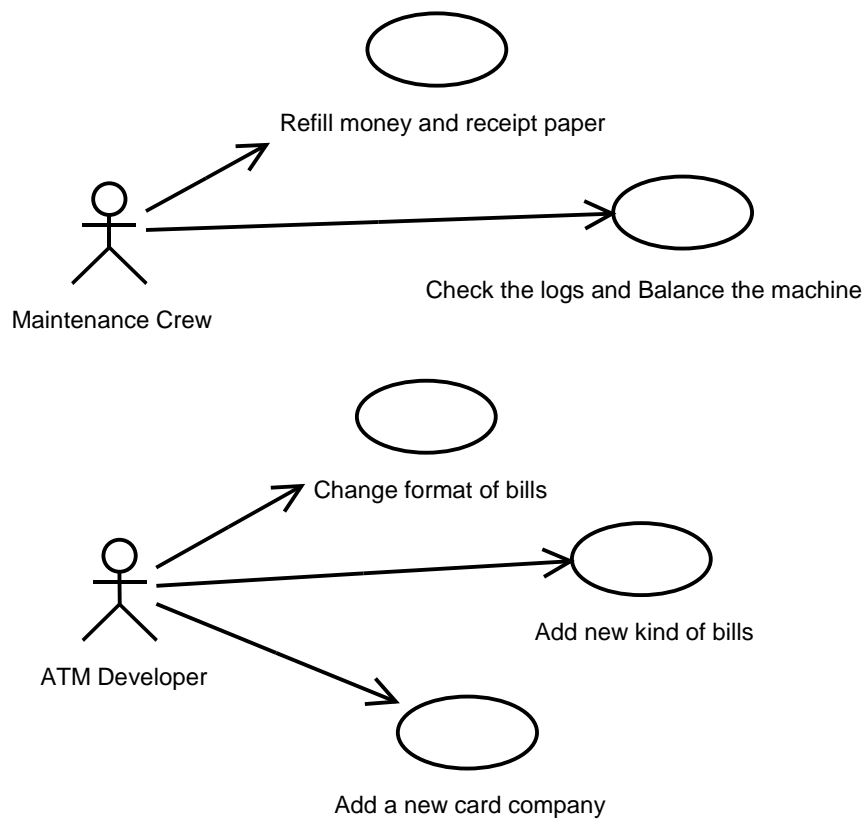


Figure 3. Diagram of Support and Maintenance Use Cases

4.2.2 Refill money and Receipt Paper

The Maintenance crew refills money, receipt paper and envelopes.

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4.2.3 Check the Logs and Balance the Machine

Due to a problem with the communication between the ATM and the Bank Consortium some transactions can end up in a faulty state i.e. money is withdrawn but not dispensed to the Bank Customer. This kind of transaction can be found by comparing the log of the ATM and the log of the Bank Consortium.

4.2.4 Add a new card company

This is the way to introduce another card company, Visa, MC, Diners Club, etc.

4.2.5 Add new kind of bills

New bills can require HW redesign of the system. But usually is the money handling something you buy as components. In that case - how to manage new values?

4.2.6 Change format of bills

New format on a bill may not work in your money handling hardware. Can it be solved with reprogramming?

4.3 Future development

Here are some ideas for new functionality for ATM machines.

4.3.1 Transfer to another person's account

This is an interesting function - but how much are you allowed to see of the other account?

- Nothing?
- Name?
- Name and address?

How do you verify that the money ended up at the right account? This can be a security problem.

4.3.2 Deposit coins

This is to join an automatic coin counter with an ATM. It is a quite useful use case for shopkeepers etc.

The machine counts the coins, returns the faulty ones and deposits the amount on selected account - this deposit works direct. There is no delay for manual counting.

4.3.3 Refill a electronic cash card

Interesting idea - but it needs a new kind of card reader/writer. It is a nice thing because the bank will not need to refill bills.