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**Software Objects**

**Boundary Objects:**

--1.Card Reader

The card reader is used to detect the account number, cardholder information, and authorization code contained on a card. It is a boundary object as it interacts with the user and takes in input, resulting in an output to the user of whether or not the card is valid.

2.Customer Console

This consists of a keyboard and display which helps the users to insert their pin and choose their account type. It is also used to display messages for invalid PIN or insufficient funds. As it displays the output of various transactions to the customer it is a boundary object.

3.Network connection to bank

The ATM machine has to have a constant connection with the bank server to retrieve customer information like balance and authentication details. This network connection is a boundary object as it receives data from the bank server and interacts with the bank server which is the actor in this case.

4.Cash Dispenser

The ATM provides the money to the customer using the cash dispenser where the bills are stored after the transaction is complete. This is a boundary object as the actor here is the customer who receives the bills and the dispenser has to interact with the user.

5.Receipt printer

The receipt printer provides the details of the transaction detailing the amount drawn. This is a boundary object as it is similar to the cash dispenser and interacts with the customer.

**Controller Objects:**

--1.Session

The session begins when the customer inserts their card and logs into the system and ends when the cash is dispensed, and the card is taken out. The session is a controller object as it maintains a connection between the bank and the machine and also interacts with the boundary object such as the customer console. In summary, the session doesn’t know a lot about the current customer. Instead, it serves as the glue between the customer and the banks server.

2.Transaction

A transaction is a subset of a session and in every session the user is given a choice between multiple transactions, it is a controller object because it interacts with the bank as well as the user, when the PIN is entered, it validates this with the bank server to check if it is correct and then notifies the user to proceed with the next transaction.

--3. Fund adjuster

This object is apart of the account information entity, in that this object serves the purpose of adding or removing funds from the customer account. We chose this as a controller since the object itself does not know what to do until the account is instantiated. It simply controls the fund transfer between the customer account to the customer.

**Entity Objects:**

--1. Account information

The account balance information returned by the bank is used to show the customer the available funds. This account also knows how to add/remove funds and restrictions of the account. This is the data stored in the bank server and instantiated depending on the user hence making it an entity object.

2. Card authentication

Information encoded on a customer's ATM card is stored in the bank server based on the unique ID of the customer. This data is matched with the PIN entered to authenticate the user. This is an entity object as data is stored and retrieved when necessary.

3. Log of transactions maintained by machine

The machine maintains a log of transactions for each user that is uploaded to the bank website to maintain logs and update bank statements. This is an entity object as it represents the system’s data from the domain system model.