Design Patterns Challenge

The following exercise is for you to apply the concepts we reviewed together in the design pattern session we had this week.

Context

The implementation that you made for the Bank agent challenge was a total success, the directive board decided to allocate some budget to improve this system and build at least one new system to improve the audit process. So you are in charge to design and implement these new requirements.

Bank

- The design and implementation should allow me to add another agent type and bank operation with the less impact.
- The dispatcher must be unique and it must have a single point of access.
- Each time a transaction is executed a new message must be sent in order to other interested systems can read it (observers). In the future more than one system will be waiting for those messages
- A transaction message must have the follow information:
    - CustomerID
    - CustomerEmail
    - AgentID
    - MessageType
    - AccountID
    - TransationDate
    - TransactionValue
    - TransationType
- In order to send the message you must develop a well-defined service that allow me to send any kind of message. This service will be a support/utilitary service that could be used in other processes. The service must have at least one operation that can receive a message and send it.

Audit Module

This system is going to take each transaction message in order to analyze it and perform a set of actions. Those actions could change in the future, your design should be flexible and maintainable in order to allow me to add new actions with the less impact. Right now the process is:

- Process a transaction message any time a new message will be available.
- Take only the transactions with TransactionType: DEPOSIT and TransactionValue greater than 10000 USD.
- Write those transactions in a text File.

Note: Take into account that the bank is getting a new messaging system that is going to allow manage a huge number of messages, so system must be flexible enough to change and be ready for that.

Marketing System

Another legacy system that is going to receive information from the bank and it will send back any kind of advertising to a customer. The idea is use that service as is today. (For the challenge is enought implement a SendAD method printing a simple message like this: "sending cupons for customer XXXXX")

The service interface for marketing service is:

```
abstract class MktService {

public void updateInformation(String customerID, Double transactionValue, String email) {
System.out.println("Check value :" + transactionValue);
this.sendAD(customerID, email);
}

abstract public void sendAD(String CustomerID, String email);

}
```

Transaction File Definition

- The file name must be DEPOSITSTOREVIEW-MMDDYYYY.txt
- each column must be separate by comma
- each column must have this information
    - CustomerID,AccountID,TransactionValue

Deliverables

- Create at least one diagram to communicate the solution where you can explain why your design is flexible and manteinable, be prepared to explain your design.
- Code must be in a Bitbucket repository
- System must be work as we expect.
    - A set of customers must be attended by a Cashier, supervisor or Director depending on the rules defined in the previous challenges
    - An audit system must produce a file with deposits greater than 10000 USD. Take into account this process could change and we could add/remove steps in the process.
    - A solution that allows to add more internal/external systems like the audit system, interested in receiving messages.
    - A solution that allows me to add more agents or transaction types.
    - A solution that allows me to create more message types.
    - A well-defined Message service to send messages to other applications interested in it.

Extra points

- Banks is going to grow opening new offices around the country . so how the design could be prepared for this new Challenge ? (just think an propose a solution)