Project Part 3: Refactoring

Project Title: Stock Score

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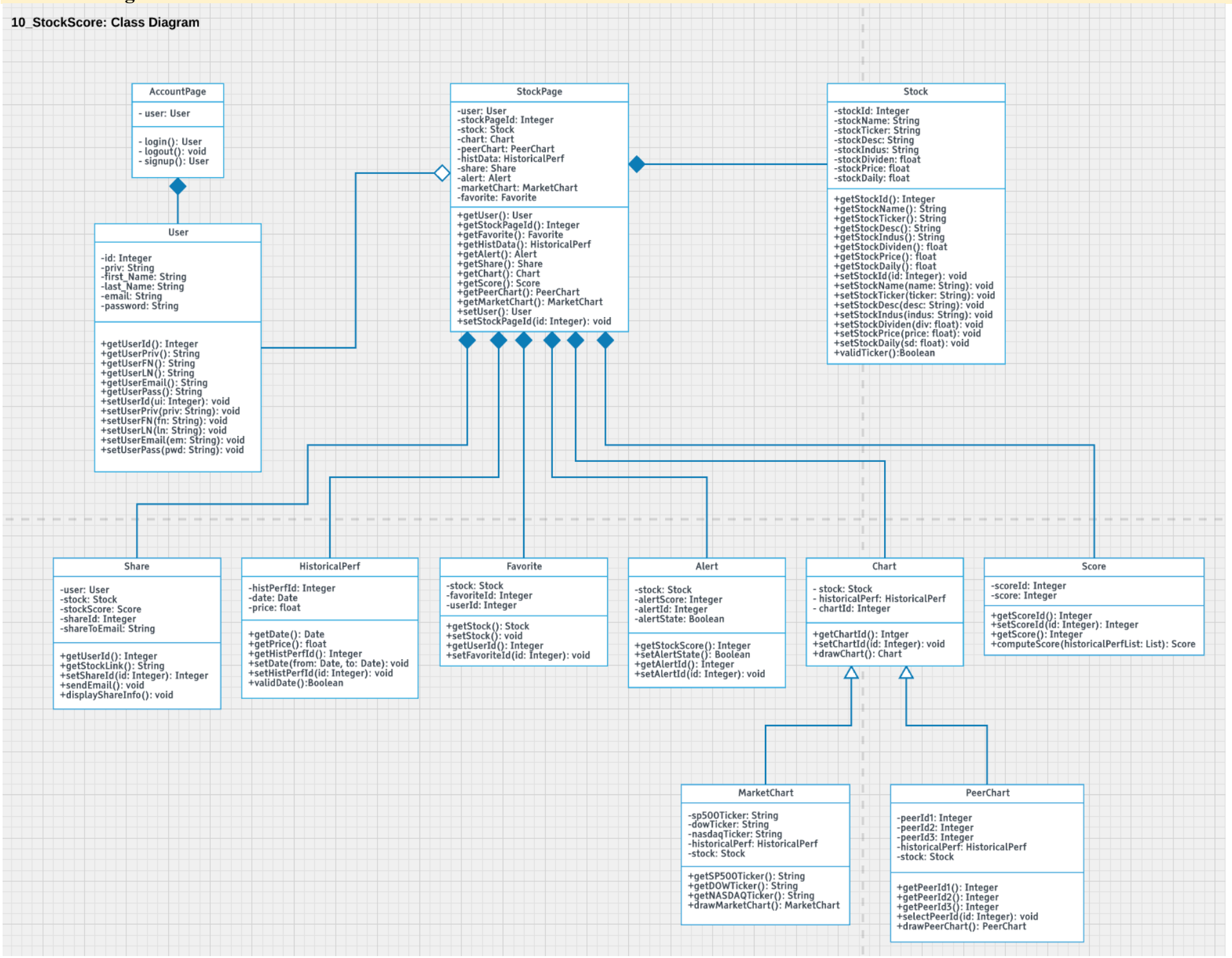
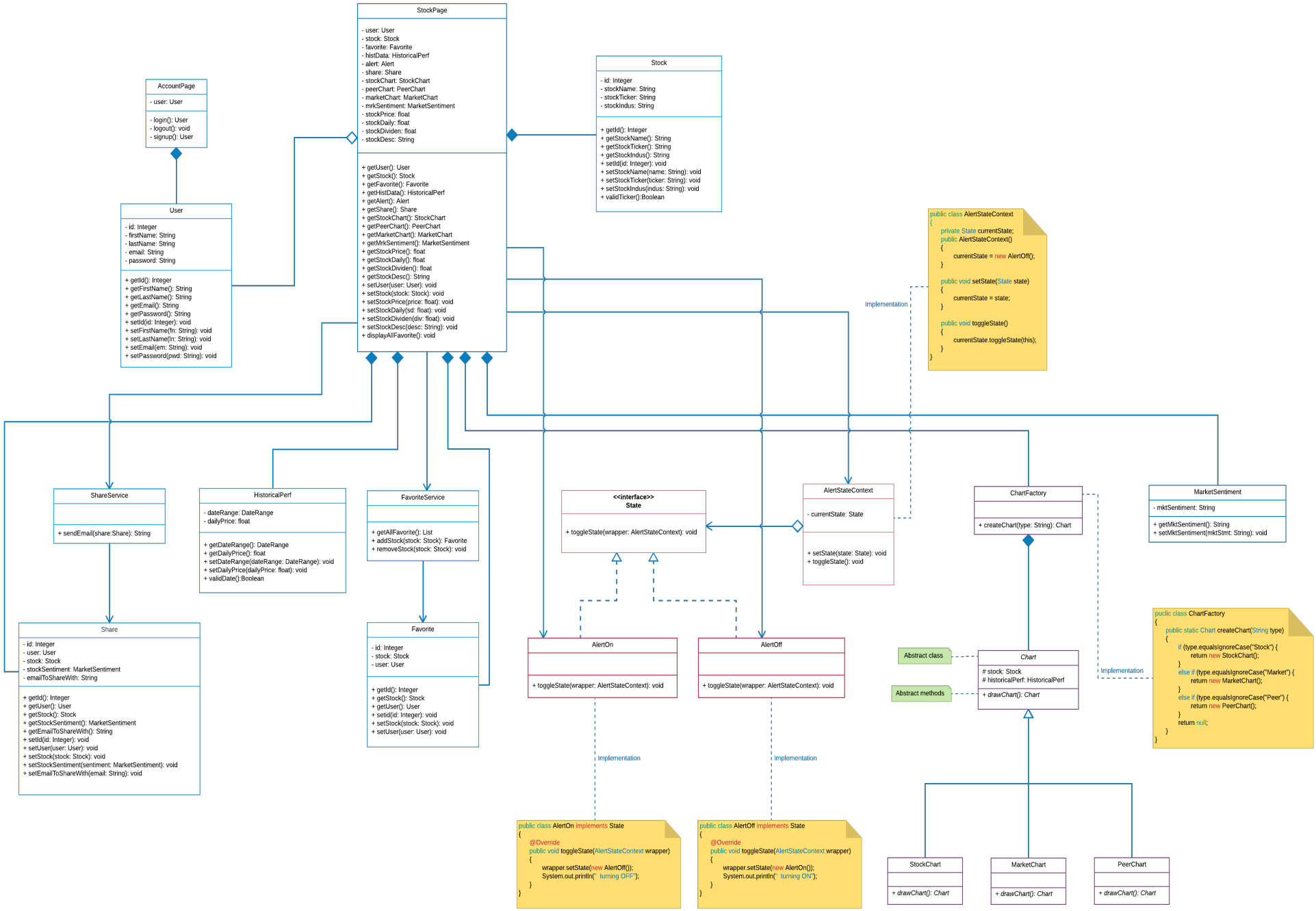
Old Class Diagram from Part 2:



New Class Diagram:



Applied Design Patterns

Factory Method Pattern:

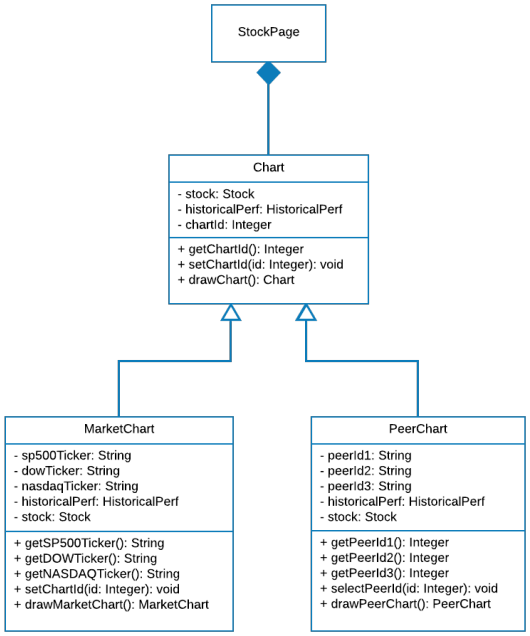
Due to the existence of an inheritance hierarchy among the base class **Chart** and its subclasses **MarketChart** and **PeerChart**, we decided to add a polymorphic creation capability by defining a static factory method *createChart()* in the factory class, **ChartFactory**. The factory method returns three different instances of Chart: **StockChart**, **MarketChart**, and **PeerChart** and allows the subclasses of the abstract class, **Chart**, to decide which type of concrete Chart to create by overriding the abstract method, *drawChart()*, declared in the class **Chart**.

In this way, **StockPage** (as the client) only needs to call the generic function of *createChart()* in the factory class as a following example when new charts need to be added without affecting **StockPage** or **ChartFactory**.

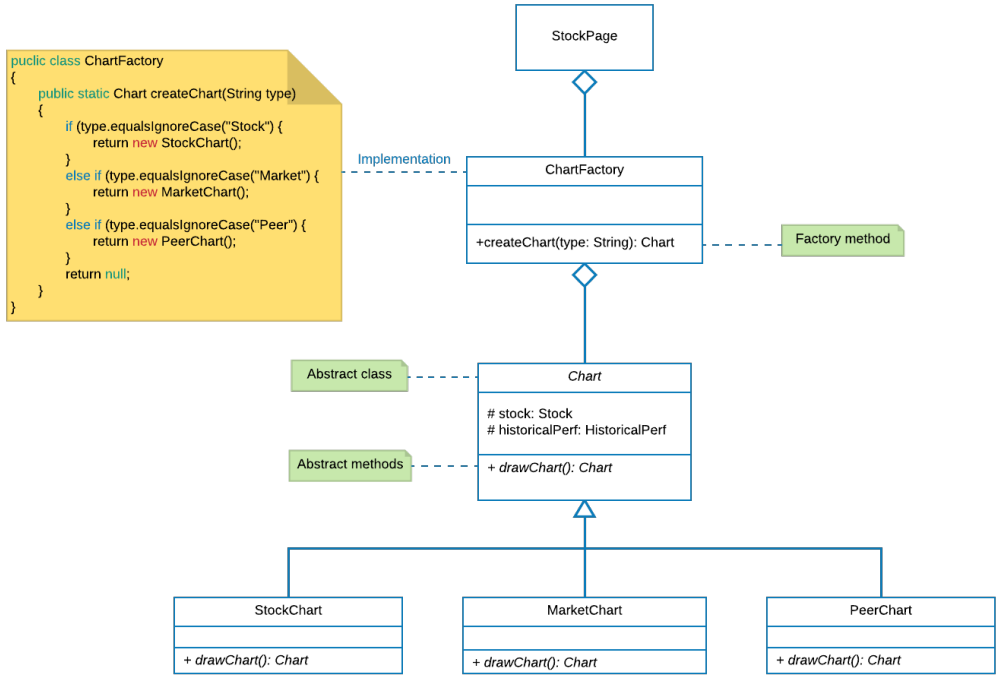
```
Public class StockPage
{
    public static void main (String[] args)
    {
            Chart sp500Chart = ChartFactory.createChart(“Market”);
    }
}
```

For more detailed implementation of the changes, please look into the following diagrams.

[Original Class Diagram]



[After Applying Factory Method Pattern]



State Pattern:

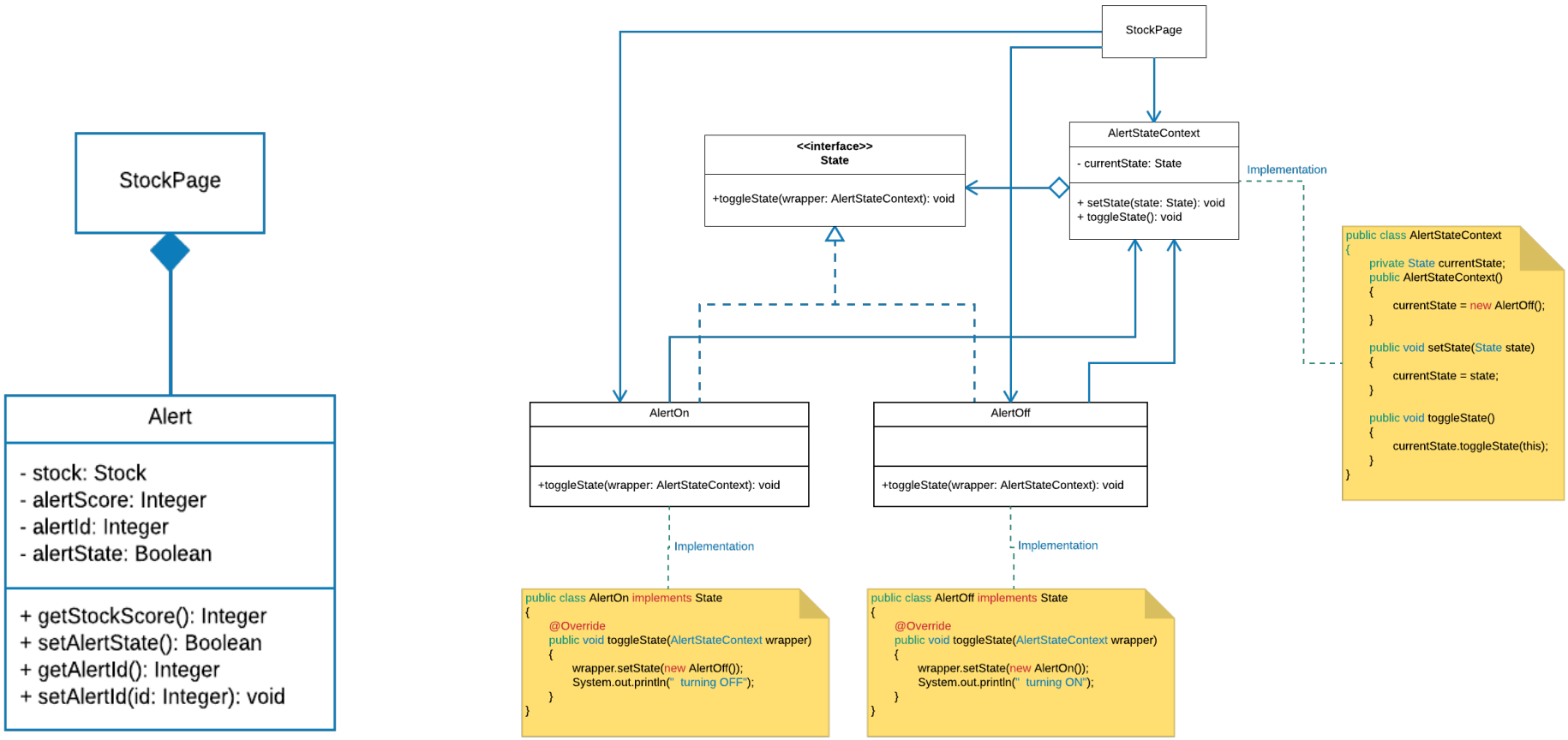
To allow the object **Alert** to alter its behavior when its internal state changes from **OFF** and **ON** and vice versa, we applied State Pattern to create two new classes, **AlertOn** and **AlertOff** of the context object, **AlertStateContext** and to extract the state-related behaviors into these classes.

AlertStateContext contains an instance of a concrete State subclass, **AlertOff**, that defines the *currentState* and the **AlertStateContext** will delegate the execution to each state object, **AlertOn** and **AlertOff**. The class **AlertStateContext** defines the interface ***State*** of interests to **StockPage** and ***State*** encapsulates *toggleState(wrapper: AlertStateContext)* behavior associated with a particular state of the **AlertStateContext**.

Both **AlertOn** and **AlertOff** subclasses implement a behavior associated with On or Off state of the **AlertStateContext** by overriding *toggleState(wrapper: AlertStateContext)* method, which follows the common interface ***State***.

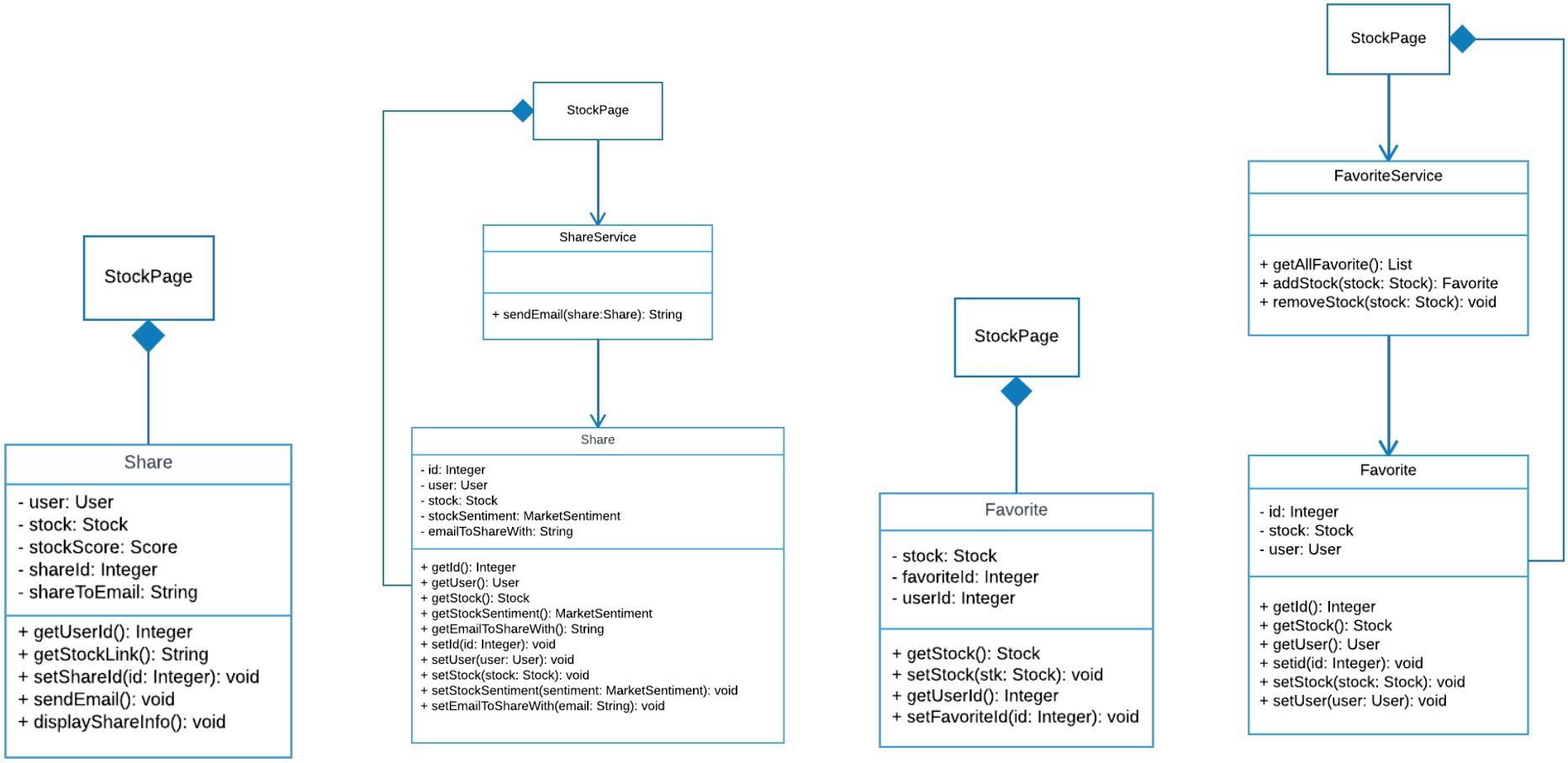
For more detailed implementation of the changes, please look into the following diagrams.

[Original Class Diagram] **[After Applying State Pattern]**



Other Refactoring Changes

- ✓ We separated the entity and the actions on the entity into two separate classes. The entity for Share or Favorite only contains the getters and setters. Actions such as getAllFavorite() was moved to the FavoriteService class. This follows the single responsibility principle.



[OLD Share] **[NEW Share]** **[OLD Favorite]** **[NEW Favorite]**

- ✓ We removed storing information for stocks that can easily be retrieved via APIs and may change so that we avoid stale data. For example, we moved current stockPrice from the class Stock to StockPage due to its frequent changes. StockPage will get the stockPrice from an API.