Business rules

1 - The company shall

1.1 – Be identified by the company’s tax id number

1.2 – List its contact information and industry

1.3 – Have a stock symbol on a single market

1.4 – Have a valuation as of the IPO

1.5 – Have a set number of authorized shares at a given time

1.5.a – The Authorized Shares shall

– Have a set number of shares

– Have an authorization date

1.6 – Have all unissued stocks held in a treasury

1.6.a – The treasury shall

– Have a set number of reserved shares

– Keep track of all changes to the number of reserved shares

– Retain the date of any change in the number of reserved shares

2 - The stock listing shall

2.1 – Be identified by the tax id of the company listing the stock

2.2 – Have the date on which the new shares were listed

2.3 – Have the total number of shares listed

2.3 – Have the number of new shares offered

2.4 – Have the number of listed shares sold

3 – Each trade shall

3.1 – Be identified by a trade id

3.2 – Have a time stamp

3.3 – Have a share price, number of shares, and type

3.4 – Be of a single company’s stock

3.5 – Update and verify the holdings of the buyer/seller

3.a– All participants in a transaction shall be recorded

3.b– The role of each participant shall be recorded

4 – Each share type shall

4.1 – Be identified by its name

4.2 – Have certain attributes

4.2.a – A price (set or derived)

4.2.b – Specific voting privileges

4.2.c – A dividend %

4.2.d – Any vestment conditions(if applicable)

5 – The contact information shall

5.1 – Be identified by a tax id number

5.2 – Contain the name, address, phone number, and email

6 - Each holding shall

6.1 – Be identified by the holder’s tax id number

6.2 – Have contact information

6.3 – Have a number of shares currently held for a single type of share

7 – The stock price and current market capitalization shall be dynamically determined

7.1 – The common stock price will be determined by the most

recently executed trade by dividing the monetary value of the trade by

the number of shares bought/sold

7.2 – The market capitalization shall be calculated by multiplying the current number of outstanding shares of each type by their respective share price and adding them together.

Business conditions/restrictions:

1. Whenever a number of shares is authorized to be sold by the company (Such as during an IPO or a stock split) the number of shares in the authorization that exceeds the currently authorized amount, are added to the company’s treasury. Then, the company may list/sell any portion of the new shares it wishes.
2. When a company wishes to sell shares on the open market, it creates a new stock listing. The listing records the number of new shares to be listed, the new total of listed shares, and the number of the listed shares which have been sold.
3. Upon the creation of a new listing, the number of shares in the listing must be deducted from the number of reserved shares in the treasury.
4. Whenever a company sells shares on the open market, the number of shares sold is added to the shares sold attribute in the current Stock Listing tuple for the company.
5. A new listing may never be created with more shares than currently exist in the treasury.
6. The number of common shares sold, may never exceed the number of shares listed at a given time.
7. The number of shares in the treasury, plus the number of outstanding shares of all types, plus any listed but unsold shares, must equal and never exceed the authorized shares for a company, at a given time.
8. The number of shares offered (and not redeemed) across all active stock options/warrants may never exceed the number of shares held in the treasury at a given time.
9. For stock option and warrants, the number of shares redeemed may never exceed the number of shares offered, and redemption may never take place after the expiration date.
10. Each time a transaction is created, the buyer, seller and any third party to the transaction (such as a brokerage) must be recorded. The buyer and seller may not be the same party.
11. For each transaction, the buyer’s and seller’s holdings must be updated to reflect the change in stock ownership.
12. Each transaction must be checked to see if the listing company is the buyer; if it is, the number of shares must be added to the company’s treasury rather than to a holding. Additionally, if the shares involved in the transaction were of the type common, then a stock listing must be created with a negative amount equal to the number of shares in the transaction to represent the removal of those shares from the common market listings of the company.
13. The number of shares in the treasury may never be less than zero.
14. Upon redemption of a stock option or warrant:
    1. A transaction must be generated.
    2. The number of shares redeemed must be increased based on the transaction.
    3. A new listing must be created for the number of shares redeemed if the share type associated with the option/warrant is common. Otherwise, the number of redeemed shares must simply be subtracted from the treasury.
15. All shares in the treasury are of type generic and may be sold by the company as any type it wishes.

**Design Documentation**

**Entities:**

* **Company\_Stocks**
  + Holds the Information about a company that sells stock, such as the Industry the company is a part of, the exchange it lists its stock on, its ticker symbol and the initial value of the company as determined during the IPO process.
* **Stock\_Listings**
  + Holds the information about the number of shares the company currently has listed on the exchange. New tuples are created every time this number changes, such as during an IPO, or when a company lists stock it had previously held in reserve in its treasury, or when it repurchases stock to be placed back into its treasury. The last created tuple keeps a running total of listed shares sold which builds upon the value from the previous tuple.
* **Authorized\_Shares**
  + Holds the information about the total number of shares the company is authorized to sell. New tuples are created when this number changes, such as at an IPO or during stock splits.
* **Treasury\_Transactions**
  + Holds the information about a company’s stock treasury transactions. New tuples are added whenever stock is added or removed from the treasury. The last created tuple keeps the running total which is built on the size of the transaction and the running total from the previous tuple.
* **Contact\_Infos**
  + Holds the common information about all entities which may interact with the stock, including buyers, sellers, brokerages, and companies.
* **Stock\_Types**
  + Holds the name and description of each type of stock that a company deals with. Current types to be included are (Common, CommonRestricted, Preferred, PreferredFlat, Unlisted)
* **Holdings**
  + Holds the information about each separate stock holding. A holding is generated for every entity (besides the listing company) who owns shares of the company’s stock. A separate holding is created for each type of stock that is held.
* **Transactions**
  + Holds information about every stock transaction that takes place involving the company’s stock. A new tuple is created for every transaction and includes which company the stock belongs to, what type it is, when the transaction took place, the price the transaction acted upon, and the number of stocks involved. For every tuple in Transactions, a minimum of two tuples must be created in the Transaction\_Participants association table (one each for the buyer and seller, with an optional one for the brokerage, if involved).
* **Transaction\_Participants**
  + Primarily, an associate table between stock transactions and the entities involved in them (the Contact\_Infos and Transactions entities). Will contain a minimum of two tuples for every tuple in the Transactions table, one with a Role attribute value of Buyer, and one with Seller. An optional tuple may be created when appropriate for each tuple in Transactions with a role attribute value of Brokerage.
* **Stock\_Attributes**
  + Holds the information about the attributes of different types of stock. Contains the name of the attribute and the value associated with it. Currently planned attributes are dividends percentage for different types of stock, voting rights for different stock types, and the base assigned value of preferred stock.
* **Attributes\_By\_Type**
  + An associate table that matches the types of stocks to the attributes that apply to them.