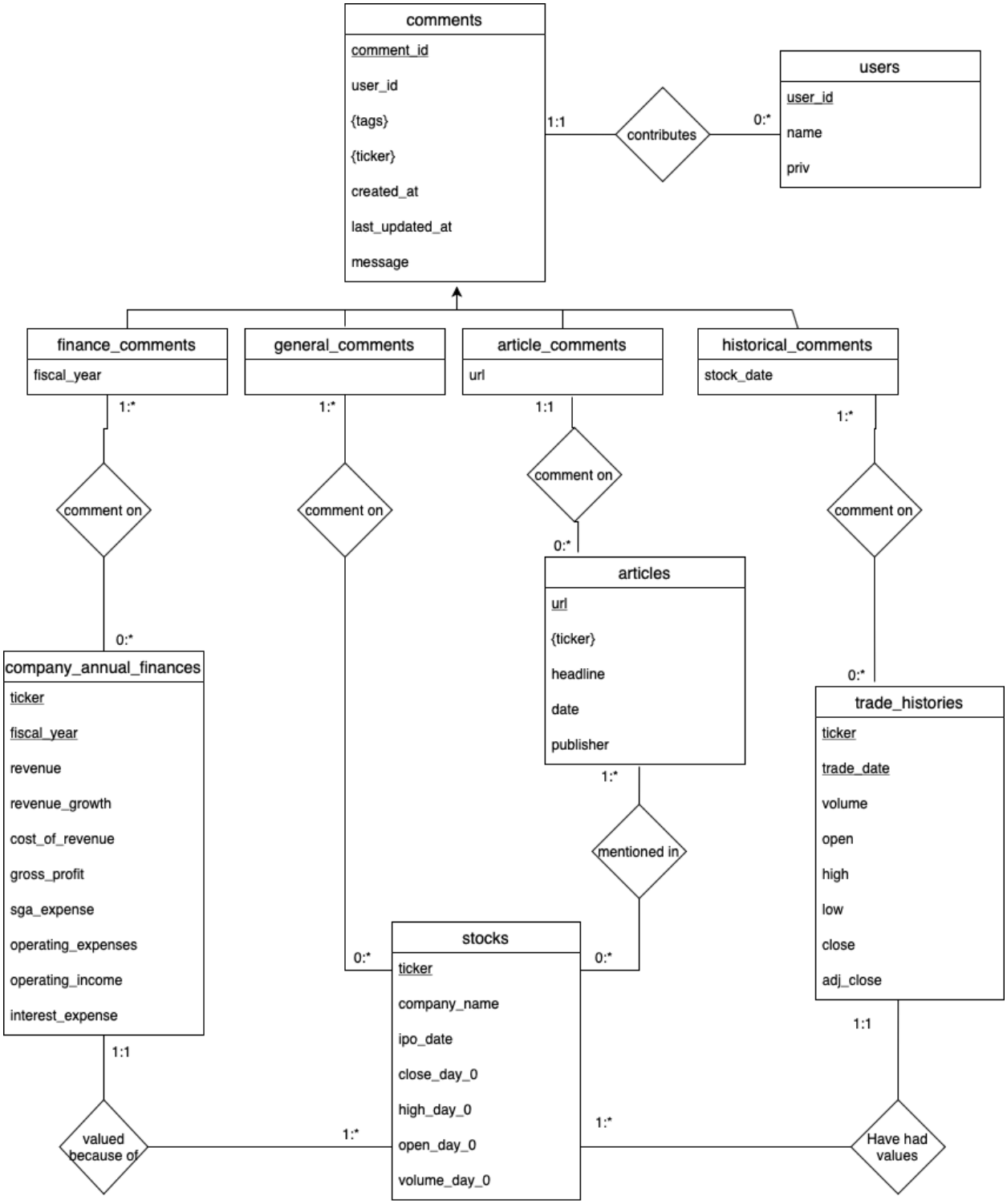
Stocks Project Design Document

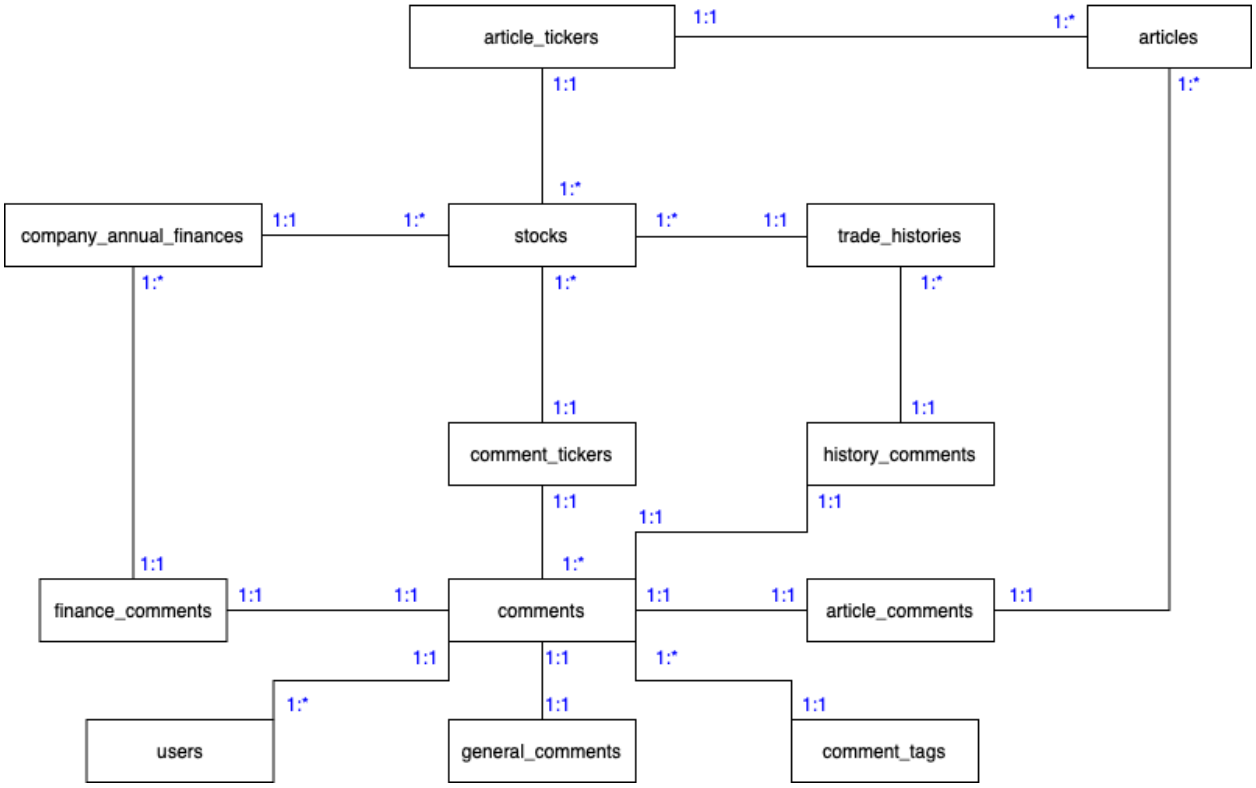
Project Design Assumptions

1. Historical stock data cannot be changed, only new entries for new days can be added
2. No two stocks can have the same ticker
3. This database will be used by a platform that allows users to make comments on stocks on top of analyzing stock data
4. New stock data can only be added by users with higher privilege (company employees), and users with lower privileges (customers) can only add comments or view trade histories.

E-R Design as learned in class



Final Relational Schema diagram



Based off the diagram provide on the piazza doc:

- 1:1 = | (one-to-__)
- 1:* = || (many-to-__)

Final Schema Table Specification

Blue attributes are foreign keys

Preliminary Client Application Interfaces (sketch drawing)

Our client application interface is CLI-driven. As such, there aren't any relevant mockups for what a user interface looks like, since it is all dependent on the user's terminal. The API is not set-in-stone and subject to change, but some examples are provided below.

Some meaningful data pulls for a user that the CLI would provide would be:

- For a given ticker, what was the price of the stock on a given date? What was the average price of the stock on a given date range? What was the average price of the stock for a given month of a given year? Price & average price could also be substituted with opening price & average opening price, closing price & its average, adjusting closing price & its avg, high price & its avg, low price & its avg. Example to get average closing price of AAPL over month of October in 2010, and to get average adjusting closing price of AAPL over 5 day period starting from 2010-10-10:
```
stock get-price --name AAPL --year 2010 --month 10 --closing
stock get-price --name AAPL --date 2010-10-10 --days 5 --adj-closing
```
- For a given ticker, what is the movement (delta) of the price over a given period? Price could be in terms of any of the prices included in the database. Example to get opening price delta of AAPL over 5 day period starting from 2010-10-10, and to get opening price delta of AAPL over Q2 of 2010:
```
stock get-price --name AAPL --date 2010-10-10 --days 5 --opening --movement
stock get-price --name AAPL --year 2010 --quarter 2 --opening --movement
```
- For a given ticker, what articles did a given publisher write in a given month (or a given period of time)? What articles did a given analyst write in a given month/period? Example to get articles (headlines + URL) of AAPL published by GuruFocus in October 2010:
```
stock get-news --name AAPL --month 2010-10 --publisher GuruFocus
```
- For a given ticker, what is the revenue growth over a span of years?
```
stock get-indicator --name AAPL --range 2014 2018 --revenue-growth
```
- For a given ticker, what is the closing price on the first day of IPO?
```
stock get-ipo --name AAPL --price
```
- For a given date, what tickers reached a trade volume threshold?
```
stock get-tickers --type volume --threshold 200000 --date 2019-07-05
```

- Users can also add comments to stock information, news articles, company annual finances, and trade histories. An example for adding a comment on AAPL's financial performance in 2020 is:
```
stock add-comment --type finance --ticker AAPL --year 2020 --message="Apple had another great run in this year" --tag="iPhone 12"
```

The commands would be set up in certain categories (get-price, get-indicator, get-tickers, etc; these are subject to change) to facilitate organization per category: that is, validating that certain

arguments are passed depending on which category is used, and organizing the output in a meaningful way depending on which category is used. For example, the get-indicator category must be provided with a ticker name (--name AAPL) as well as a flag for which type of indicator is being retrieved (--revenue-growth), and will return the intermediate and cumulative values over the range. The get-tickers category must be provided with a type and a threshold and will return the stock names that meet that threshold for that type in the given date/range/period provided.

If the user command is missing required parameters for a category:

```
stock get-tickers --threshold 200000 --date 2019-07-05
```

the application would return a message like:

```
Error: CATEGORY `get-tickers` must include VALUE for PARAMETER `type`
```

This would prompt the user to try again, providing a proper value for the parameter.

If the user provides invalid values for parameters:

```
stock get-tickers --type headline --threshold 200000 --date 2019-07-05
```

the application would return a message like:

```
Error: ARGUMENT `headline` is not a valid VALUE for PARAMETER `type`
```

This would prompt the user to try again, providing a proper value for the parameter.