Final Project: Data Model Rationale

This document is meant to describe why certain designs were chosen and how certain decisions were made for the official solution to the final project data model. Every data model necessarily involves design decisions. Some designs are better than others and some decisions are better than others. On the other hand, some designs are not better and not worse but are simply different.

If your solution for the final project data model does not exactly match the official solution, your solution is not necessarily wrong. It could simply be different. Your solution will not be marked for how closely it comes to matching the official solution. It will be marked for how closely it comes to meeting the requirements as laid out in the Part 1 project brief.

Shareholder Table

Investopedia (http://www.investopedia.com) defines a shareholder as:

"Any person, company, or other institution that owns at least one share in a company".

Shareholders could have been modeled using a single table that contains all the fields needed to describe either a person, or a company but shareholder was modeled using subtype tables. The decision of whether to model shareholders with a single table or subtype tables was based on the types of reports (queries) that would be necessary. Our reports (queries) were intended to mimic reports provided by Yahoo Financials. (For examples, see the page on major holders of Google at http://finance.yahoo.com/q/mh?s=GOOG+Major+Holders) Because direct holders, institutional holders and mutual fund holders are reported separately on Yahoo Financials, it was decided to model these types as separate tables. However, because the table structures for institutional holders and mutual fund holders would have been identical, it was decided to put both mutual funds and institutional holders in the same table. Moreover, institutional holders and mutual funds are themselves companies and would have identical table structures. Therefore, it was decided the existing company table would hold "companies" (those whose stock is traded), institutional holders (companies who hold stock in other companies and may or may not themselves be traded) and mutual funds (which are also companies that hold stock and can be themselves traded, if they are “exchange traded funds”).

Shares Authorized Table

Our database must record the number of shares authorized. However, the number of shares authorized could change over time. Therefore the shares_authorized table uses a start_date and end_date.

Trade Table

All records pertaining to the acquisition of shares are stored in the trades table. Shares can be acquired in a number of ways:

1. When a company sells shares on the primary market (the new issue market).

2. When a shareholder buys shares from another shareholder it becomes the owner of those shares (and the seller is no longer the owner of those shares).
3. When a stock splits by a factor of 2, the number of shares owned each current shareholder doubles. (For each shareholder, an entry is made to the trade table for each shareholder to ADD the number of shares they currently have, thus doubling the number of shares owned.)
4. When a reverse split occurs, the number of shares owned by each shareholder is reduced by half (if the merge factor is ½). (For each shareholder, an entry is made to the trade table where the shareholder is the seller and "sells" half of its shares.)

The design for the trade table was chosen so that all data required for calculating the number shares owned is available in one place.

Stock Price

Stock prices can change throughout the day. The modification to stock price was very simple: we just added time_end as a non-key column.