**3.3 Constraints & Qualities**

**3.3.1 Security**

Security is a crucial aspect of any software. One of the most important security requirements is to make sure there are no SQL injections that could breach and break our database. In order to assist in preventing SQL injections, we will be using prepared statements prior to query executing which is provided by PHP’s internal libraries. The possibility of having the database breached could potentially expose user personal user information or perhaps destroy content. The exposure of passwords is a concern in case of breach as they should be hashed and salted upon entry by using hashing algorithms such as *sha512* and *bcrypt*. This would essentially diminish any chance hackers have to brute force password entries.

**3.3.2 Performance**

Performance is important especially when working with large data sets. The user must be able to navigate and use the site without having to wait for data generation. The application shall also ensure that database design is robust with the use of proper table indexing and storage engines and cache sizes. This will essentially allow for quicker SQL query executions that are expected to return data within 100 nanoseconds. The performance shall also account for larger data execution, such as the schedule generator with a performance factor speed of no more than 5 seconds.

**3.3.2 Cross-Browser Compatibility**

There are cases where web applications do not necessarily comply with all possible web browsers. For example, certain aspects of CSS and HTML might work for one browser but break in another. This application shall ensure that the CSS and HTML model will be compliant with the browser’s boundaries. Ensuring browser compliance, the application shall be able to run on virtually any operating system that has any of the following browsers: Safari, Chrome, Internet Explorer, Firefox and Chrome.

**3.3.3 Ease of Use**

The application shall be straightforward and lightweight in order to ensure that students can start working on their schedule planner immediately. The use of Ajax technology will also minimize content and page refreshes thereby allowing users to navigate with losing the scope of the data they were working on.