Database Re-design for STEM Academy

Technology Review

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Abstract

This document looks at the different pieces involved with the project back end, and analyzes several options for managing each piece. The identified pieces of the back end are database management system, storage system and standard report generation.

1. Database Management System

1.1 Overview

We need a functioning database that can collect all the survey information in one place. There needs to be appropriate relational tables for data which are dependent on each other. Changes in one table should automatically change the table which refers to the original.

1.2 Criteria

We need to preferably look for a database software that is open source and free to use for our clients. The database administrator will be the primary user of the database. The administrator should easily be able to view and make changes to the database. The following section lists some positively reviewed free database software that we may consider for our project.

1.3 Potential Options

1.3.1 CUBRID

The surveys for this project are made from php files, and we might decide on using a more efficient web based survey software, such as Qualtrics. Either way, CUBRID would be a great open source option to collect the data and would be especially useful for this project, since it is designed specifically for web applications. The database solution is written in C, and is capable of processing large amounts of data.

1.3.2 Firebird

Firebird is a relational database and should be very helpful in creating well-defined relationship between database tables. The database system features many SQL standards and should be relatively easy to work with. Firebird is capable of running on Linux, Windows and a variety of Unix platforms. This software can potentially be tested by importing a csv file of collected survey data.

1.3.3 MariaDB

MariaDB is created by the original developers of MySQL and is used by tech giants like Wikipedia, Facebook and Google. The database server provides most of the functionalities from the previously mentioned database systems including drop-in replacement, and should be compatible with our project. MariaDB developers prioritize security, and enhance and merge all of MySQL's security patches.

1.4 Discussion and Recommendation

All of the listed options are free and viable for use in our project. Once we have access to the survey php files, we will test their capability of working with each database system. If we choose to use an alternate survey software, we will test how well the collected data can be integrated into each system.

1.5 Conclusion

Once we test each database system, we will as a team decide which option will be the best for our project. As of this moment, CUBRID seems to be the most viable option as it specializes in working with complex web services.

2. Report Generation

2.1 Overview

The survey data needs to be displayed in standard reports with visual aid to help interpret the data. We will look for free and open source report generation tools, as we aim to minimize funds in every aspect of our project.

2.2 Criteria

Besides integrating the collected data into a database, we need to generate standard reports that illustrate the data with graphics. These reports should be well defined and look finished enough to share directly with potential funders of the program.

2.3 Potential Options

2.3.1 R Software

2.3.2

2.4 Discussion and Recommendation

2.5 Conclusion

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