Organised Access to Historical Student Data

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Project Introduction

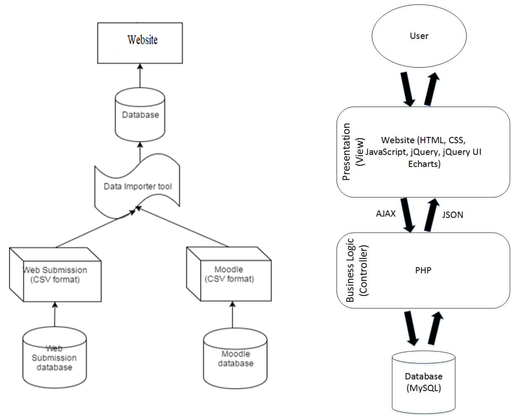
- 12 years of Moodle and WebSubmission data has been collected and the problem now is organising it for searching and trend analysis.
- Moodle and WebSubmission are separate systems. What we are doing is to tie the two systems together by designing a database schema that will take into consideration and incorporate both systems.
- All data is anonymised and is identified in a way that allows us to associate actions without identifying the students, which ensures the privacy.
- Raw data is not logically well organized and hard to read.
- Visualization is provided by presenting data in the form of charts, which makes the data more intuitive.
- A lot of configuration options are provided to allow users to manipulate the data displayed in the charts and allow users to interact with the charts.
- Analysis module is provided to allow users to explore the relationship between the amount of students' activities and academic performances.
- Staffs are allowed to query the database, extract data, aggregate it, and export it.
- Extraction and insertion scripts (data importer) that work with the file-based storage for the current data are provided.

Project Objective

- Design a database schema that incorporates the two separate systems (Moodle and WebSubmission).
- Link two data sources and link the users (which are anonymized) of two data sources.
- Write extraction and insertion scripts (data importer) to import current file-based data.
- Provide visualization of data by using charts and make them configurable to allow users to manipulate and interact with data.
- Analyze the relationship between the amount of students' activities and academic performances.
- Allow staffs to query the database, extract data, aggregate it, and export it.

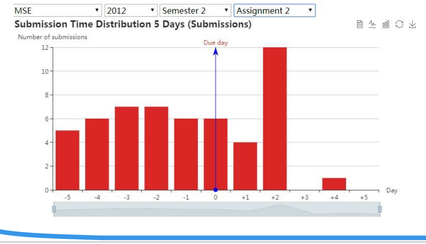
System Architecture

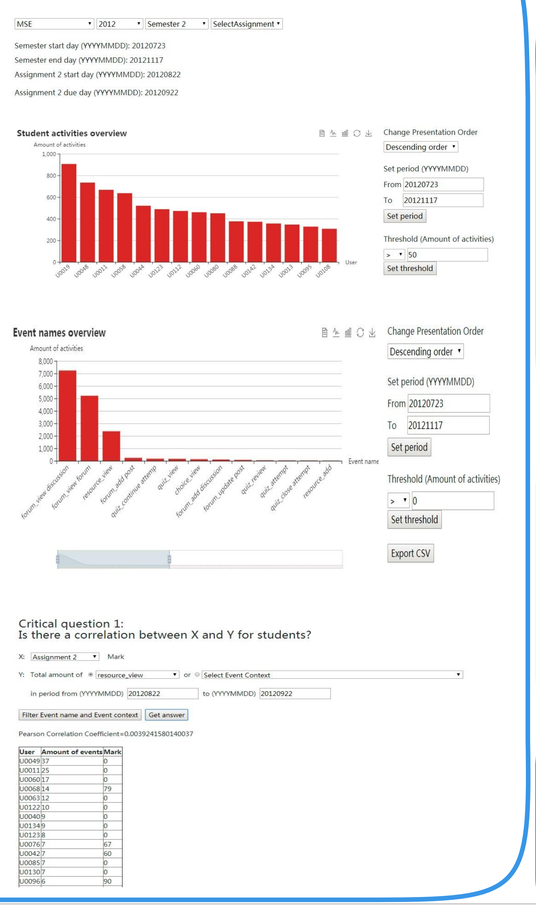
- The database schema is built based on two data sources (Moodle Forum and WebSubmission).
- Data Importer tool extracts data from data sources to database.
- The website displays and analyzes data by charts and tables.
- The website is designed in a decoupled way. It adopts two-tier model, which separates the front-end and the back-end.



Charts and analysis module

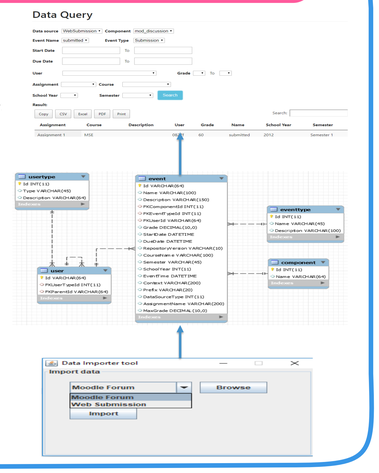
- Provide visualization by using charts, which make the data intuitive and easy to read.
- Provide lots of configuration options and related functions (set period, change presentation order, threshold function, export data in CSV format, event name/ event context auto-complete), which allow user to further explore and manipulate data.
- Allow user to choose course, year, semester, assignment.
- Provide data of individual student as well as the whole class.
- Provide the amount of different events in a given period as well as the amount of specific event of each day.
- Link two data sources and link the users of two data sources.
- Provide cross data analysis: allow user to explore the relationship between the amount of students' activities and academic performances.





Data query module, importer, database.

- Data Query module can support staff to query and extract data.
- This is a combined database of Moodle Forum and WebSubmission data sources.
- This database can be flexibly applied for newly added data sources such as Canvas.
- Data importing tool can assist to import data from data sources into database.

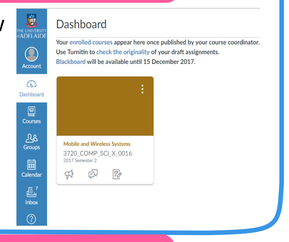


Advantages

- The database is flexible and can be applied for multiple data sources.
- Having tools to import data from external files.
- Visualization makes the data intuitive.
- Charts are configurable, which allows user to manipulate and further explore data.
- Provide analysis across two data sources. Link two data sources and link the users of two data sources without identifying their names.
- The website can be used to query, analyze and extract data with the support of charts and tables.

Future Work

- Modify the schema to work with new data source (Canvas).
- Add new data sources (e.g. student GPA) for further cross data analysis.
- Provide charts (across semesters) of the same course for trend analysis and comparison.



Acknowledgement

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