

Laboratory Data Management System

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Abstract

Scientists and engineers document research, experiments and procedures performed in laboratory using lab notebooks. Organizing and keeping a detailed account of this data is a big issue and challenge for the laboratories. Also, security and protecting the integrity of this data is a very important aspect.

So we propose to build a 'Laboratory Data Management System' to tackle these issues. While doing research and conducting experiments data can be safely stored in a structured and organized manner using the system.

1 Functionalities

1.1 Content Creator

A Rich Text Editor that allows addition of the contents of the report which may include media object such as images.

Text in HTML format can also be added and the original structure of the text is preserved.

1.2 Data Verification

Any data that is recorded by the laboratory researchers will be stored by the system. Newly added report are verified by the PI before being displayed. If approved, the data will be added to a central repository.

1.3 Speech Enabled Input

The user can add text to the reports through a Speech Enable Interface which uses Google Speech Recognition API's in the background.

1.4 Downloading Reports as PDF

The users can download the reports in the form of PDF files.

2 Implementation

2.1 Methodology Used

We used Extreme Programming (Pair programming) in the development phase of the project. Each user story was implemented sequentially and tested thoroughly.

2.2 Platform Used

The application was developed as a web-application using the following technologies:

- HTML5, CSS, JavaScript(AJAX)
- PHP
- JQuery
- MySql
- Apache Server(XAMPP)

2.3 User Interface

The user interface was designed using the Twitter Bootstrap front-end library.

2.4 Voice Input

We used Google Speech Recognition to enable the users to create Reports using voice input with the help of Rich Text Editor

2.5 Conversion to PDF

We allow the users to download the reports in form of PDF files using wkhtmltopdf which is a simple shell utility based on WebKit rendering engine and Qt.

3 Testing

We extensively tested our system on different browsers. Some users were asked to use the system to perform tasks like: Creating, Editing, Viewing and Downloading the Reports. Users found it particularly convenient to create the reports using voice Input.

Some bugs and suggestions were reported during testing and actions were taken to address them. A subsequent phase of testing followed.