Introduction

Grant development is vital to university research organizations. However, it is a complicated process requiring the assembling of materials from several sources and following strict guidelines and deadlines from sponsoring agencies. The current workflow of the Global Health Research Organization’s grant development process shows room for improvement. At the inception of a new project, old grant documents are reviewed for sections that can be reused. When identified, those sections are copy and pasted into the new working document. Organization maintenance of these previously submitted grant documents is not centralized. As a result, we developed the GHRO Grant Management System (GMS); a web application to track and manage the various sections required on an individual grant. Sections include but are not limited to: introduction, narrative, budget, budget narrative, infrastructure documents, biographical sketches, and other supporting documents. The GMS features a text block repository and project management with task assignment. The repository allows quicker and more direct access to commonly used text snippets. The project management provides a clear and organized picture of where a grant development process is at any given point.

Method

Through user interviews and a documents review, a needs assessment was completed. Key features were identified to build into the initial prototype including the text block repository and project meta-data. A MySQL database was created using MySQL Workbench. To connect the data to the interface, tools from the PHP framework CodeIgniter were customized and implemented. We used an agile software development process to progress to a useable solution. Small, incremental product iterations were pushed from development to quality assurance testing at regular and frequent intervals. Figure 1 below, shows the new workflow for grant development using this system.
Results

Two areas were found where process improvements could be made. First, a majority of grant-making agencies require a common set of sections in an application. The commonality provides an opportunity to streamline and reuse work. Second, organization of grant documents and metadata is unclear and unwieldy.

To overcome these bottlenecks we developed a web. A project is started for each grant. Text blocks and templates are pulled from the repository then edited to grant specifications. Any additional documents can then be uploaded into the project as needed. Information about the grant, such as submission and funding dates, are stored with each project.

Using MySQL Workbench, a MySQL database was designed and implemented to store the grant data displayed in the application. The database diagram in **figure 2** shows the table compositions and relationships.

The data was programatically connected to HTML tables using PHP through the CodeIgniter framework. Using the **Model-View-Controller** architecture, database input and extraction is completed in the model section. All data manipulation and testing occurs in the controller section. Once transformed by the controller, the data can be displayed to the user through a view.
**Conclusion**

Having a common, easily accessible, and controllable location to store text sections has increased the efficiency of the grant development process. Writing time has decreased leading to improved editing and a better distribution of editing efforts. As the common sections remain constant, editing time can be applied to custom sections.

Moving forward, features can be added to improve the project development portion. User accounts could be assigned to a project with tasks assigned to individual accounts. Based on assignment, automated emails could be sent as deadlines approach.