

**CS4503 Software Engineering**

**Heartland Gaming Software Suite  
Deadpool 6**

**Zachary Shaw, Wenlong Gu, Zimo Chai, Ethan Robards,  
Eliot Organick, John Talmage**

**Software Requirements Specification  
Document**

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## **Table of Contents**

- 1. Introduction
  - 1.1 Purpose
  - 1.2 Scope
  - 1.3 Definitions, Acronyms, and Abbreviations
  - 1.4 References
  - 1.5 Overview
- 2. The Overall Description
  - 2.1 Product Perspective
    - 2.1.1 System Interfaces
    - 2.1.2 Interfaces
    - 2.1.3 Hardware Interfaces
    - 2.1.4 Software Interfaces
    - 2.1.5 Communications Interfaces
    - 2.1.6 Memory Constraints
    - 2.1.7 Operations
    - 2.1.8 Site Adaptation Requirements
  - 2.2 Product Functions
  - 2.3 User Characteristics

## 2.4 Constraints

## 2.5 Assumptions and Dependencies

## 2.6 Apportioning of Requirements

# 3. Specific Requirements

## 3.1 External interfaces

## 3.2 Functions

## 3.3 Performance Requirements

## 3.4 Logical Database Requirements

## 3.5 Design Constraints

### 3.5.1 Standards Compliance

## 3.6 Software System Attributes

### 3.6.1 Reliability

### 3.6.2 Availability

### 3.6.3 Security

### 3.6.4 Maintainability

### 3.6.5 Portability

## 3.7 Organizing the Specific Requirements

### 3.7.1 System Mode

### 3.7.2 User Class

### 3.7.3 Objects

### 3.7.4 Feature

3.7.5 Stimulus

3.7.6 Response

3.7.7 Functional Hierarchy

3.8 Additional Comments

4. Change Management Process

5. Document Approvals

6. Supporting Information

# **1. Introduction**

## **1.1 Purpose**

The purpose of this document is to define the requirements for a judging system that will allow judges to grade teams' game entries in the Heartland Gaming Expo event at the University of Tulsa.

## **1.2 Scope**

This product will provide an interface for judging and registering game entries in a variety of categories. The working name for the project at this point is simply the Heartland Gaming Expo Software Suite. Teams' entries will be judged based on several criteria such as graphics, sound, concept, presentation, and the game as a whole. The app will provide an interface for team registration and manipulation by the competition organizers as well as the ability for judges with login access to enter teams' scores. This app will be made primarily as a web application relying on and editing a database of team and scoring information. This app will allow judges to enter data while offline and synchronize information into the database when a connection is regained.

## **1.3 Definitions, Acronyms, and Abbreviations.**

The Heartland Gaming Expo may be henceforth referred to as HGE.

The Software Suite may henceforth be abbreviated to SS.

## **1.4 References**

There are no current references to external documents.

## **1.5 Overview**

Section 2 provides a general overview of the operations and features provided by the software as well as its overall perspective and description. Section 3 provides a more detailed description of the HGE software suite capabilities and organization. Section 4 details the nature of this SRS document. Section 5 defines the officiation of this document. Section 6 provides supporting information to enable easier navigation and use of this document.

## 2. The Overall Description

The atmosphere the product will be employed in will be an exposition environment. This environment will experience short bursts of high traffic followed by long periods of disuse. The environment implies a low maintenance burden and long life cycle. The expo environment also may be subject to connection interruption or the need to quickly remedy real time errors. This caveat requires the software to be stable in offline and online environments. A lack of staff dedicated to maintenance of the software will require the software to support self-sustainability and independence over long periods of time.

### 2.1 Product Perspective

#### 2.1.1 System Interfaces

The HGE Software Suit may utilize mysql, html, and php technologies to interface with web browsers and android applications from a central linux server.

#### 2.1.2 Interfaces

The user interfaces will be divided primarily into two categories: Android Application and Web Browser. The android application will be used by judges to grade and edit teams during the HGE. The application will primarily be consisted of several pages or slides through which the judge will navigate to find teams and input scorings. The web application will be a secondary portal for the judges to undergo a similar process with web pages, as well as the primary interface for administrators and registrars. Registrars will register teams and print QR codes using web pages interface. Administrators will have an interface to manipulate most of the system directly through web pages.

#### 2.1.3 Hardware Interfaces

There are currently no specific hardware interfaces. Some version of Android tablet will be used.

#### 2.1.4 Software Interfaces

##### 2.1.4.1 Google Play Store (Android)-

The app must be accessible through the Google Play Store.

##### 2.1.4.2 Web Browser (HTML) -

The web portal must be accessible by a web browser in either mobile or desktop format.

### **2.1.5 Communications Interfaces**

There are no Communications Interfaces currently critical to the HGE software suite.

### **2.1.6 Memory Constraints**

There are no Memory Constraints currently critical to the HGE software suite.

### **2.1.7 Operations**

#### 2.1.7.1 Judge Operations

##### 2.1.7.1.1 Web Portal -

The judge will find and organize teams based upon scoring. The judge will also score teams in specific categories and input these scores to the database.

##### 2.1.7.1.2 Application -

The judge will use a similar interface and workflow to that of the web portal to find and organize teams based upon scoring. The judge will also score teams in specific categories and input these scores to the database. If internet access to the database is not available, the inputs will be stored locally and pushed to the database on reconnection.

#### 2.1.7.2 Registrar Operations

##### 2.1.7.2.1 Web Portal -

The Registrar will add, sort, and print information for participating teams.

#### 2.1.7.3 Administrator Operations

##### 2.1.7.3.1 Web Portal -

The administrator will sort/add/edit teams as needed. The administrator will also add/remove/edit users (judges, registrars, and other administrators).

#### 2.1.7.4 Passive Operations

The software will need the capability to process and calculate scoring information and results. The application will need to be able to seamlessly transition with the server from offline to online and vice versa.

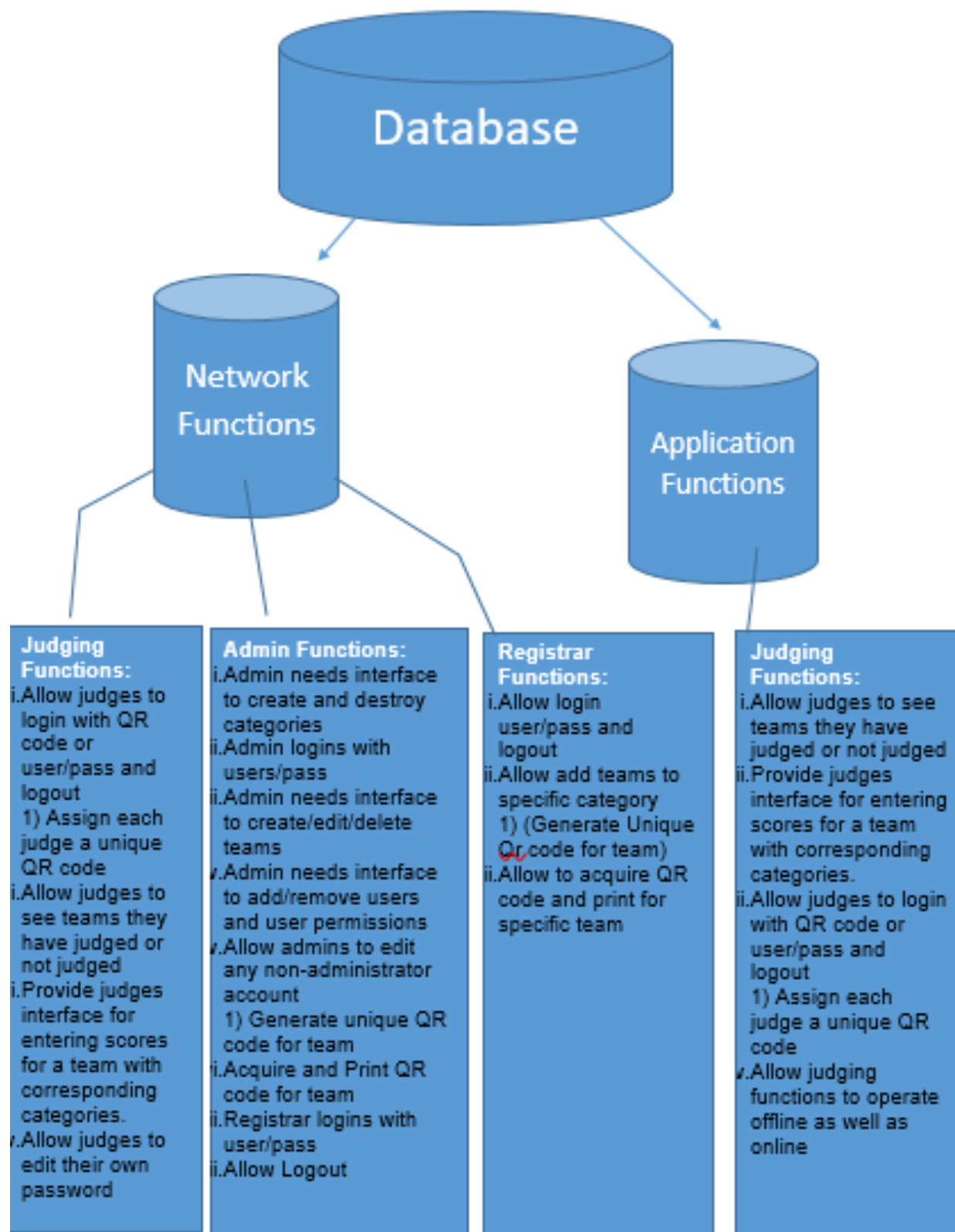
### **2.1.8 Site Adaptation Requirements**

There are no site adaptation requirements currently critical to the HGE software suite.

## **2.2 Product Functions**

The HGE SS's primary function is to facilitate the organization and management of the HGE. The SS will allow teams to check in and uniquely identify themselves. It will provide a simple and easy to use judging system for inexperienced users. It will also provide robust administration functionality for low maintenance and ease of administration.





## 2.3 User Characteristics

Users can be divided into three categories: judges, registrars, and administrators. Administrators for the HGE system will most likely be well-versed in backend administration, but need a speedy, reliable process of performing their duties. Judges may be anywhere from \_\_\_\_ to \_\_\_\_ (fill in, ask Mailler). Registrars are usually volunteers, and generally have basic technical experience.

The end users (Judges and Registrars) will need a reliable system to register, categorize and score entrants despite the venue's potentially unreliable Wi-Fi connection, and administrators will need an admin-friendly interface that quickly allows them to perform their job and correct any errors should the judges or registrars make a mistake.

## 2.4 Constraints

The hardware limitation of low performance mobile processors may need to be taken into consideration for deployment on android. Unstable internet connection may also cause database connectivity issues and should be addressed. The In this way, some backup mobile devices (like iPads) should be prepared.

## 2.5 Assumptions and Dependencies

1. If customers want to change their requirements, programmers should be prepared to modify the software suite accordingly. For example, programmers should be ready to add some new functions to the HGE software suite.
2. If programmers cannot finish their work on time (assuming the android app is last priority), a tablet-friendly website should be implemented as an extension of the network part of the HGE software suite in place of the app.
3. If the judging, registration, or administrative UI is ambiguous in any way, the developers should be able to change the UI or provide user documentation for potential judges/registrars/administrators.
4. If a new Android OS comes out that deprecates some of the functions used in the app, developers should be ready to replace said deprecated functions with more current and usable functions.

## 2.6 Apportioning of Requirements.

According to the iterative lifecycle model, which is the most appropriate strategy to use to apportion the requirements, the first step is to make up a overall planning and figure out what the general requirements are. The second step is to analyze, design and implement the database, network stuffs, and app. This step can be divided to three parts:

- 1) Building up the database is going to be the first step.
- 2) After finishing building up the database, network should be made up.
- 3) Based on the database and network, which have been built up, the tablet app needs to be explored.

Note: 1 and 2 could be done simultaneously, depending on the web software/framework used.

After that, the draft design and initial implementation should be sent to customers to test. If the customers point out that this initial implementation is not reliable, evaluating is going to be the next step to improve the original implementation. Once the implementation passes the evaluation, this work is done.

## 3. Specific Requirements

### 3.1 External Interfaces

The external interfaces utilized by the HGE SS will primarily be handled in the form of a central unix server. This central server will be the primary processor of all database and server transactions and can be accessed by ssh or physical authentication. The server will connect directly to the end user by means of a personal terminal or mobile device. These external devices must either support an android operating system or a web browser capable of reading html.

### 3.2 Functions

#### 3.2.1 HGE Website Suite Functions

##### 3.2.1.1 Judging Functions

3.2.1.1.1 Allow judges to login with QR code or user/pass and logout

- 3.2.1.1.2 Assign Each judge a unique QR code
- 3.2.1.1.3 Allow judges to see teams they have judged or not judged
- 3.2.1.1.4 Provide judges interface for entering scores for a team with corresponding categories.
- 3.2.1.1.5 Allow judges to edit their own password

#### 3.2.1.2 Admin Functions

- 3.2.1.2.1 Admin needs interface to create and destroy categories
- 3.2.1.2.2 Admin logs in with username and password
- 3.2.1.2.3 Admin needs interface to create/edit/delete teams and QR code for team
- 3.2.1.2.4 Admin needs interface to add/remove users and user permissions
- 3.2.1.2.5 Acquire and Print QR code for team should registrar be unable to.
- 3.2.1.2.6 Registrar logins with user/pass
- 3.2.1.2.6 Allow Logout

#### 3.2.1.3 Registrar Functions

- 3.2.1.3.1 Allow login with username and password
- 3.2.1.3.2 Allow logout
- 3.2.1.3.3 Allow the addition of teams to their specific category
- 3.2.1.3.4 Generate/Print a unique QR code for each team

### **3.2.2 HGE Android Application Functions**

#### 3.2.2.1 Judging Functions

- 3.2.2.1.1 Allow judges to see teams they have judged or not judged
- 3.2.2.1.2 Provide judges interface for entering scores for a team with criteria that match their category
- 3.2.2.1.3 Allow judges to login to judge with each entrant's QR code and/or a username and password
- 3.2.2.1.4 Allow judging functions to operate offline as well as online
- 3.2.2.1.5 Allow offline-judged scores to be uploaded to the database at a later time

## **3.3 Performance Requirements**

The SS should support up to \_\_\_\_ (Ask Mailler) simultaneous users. The database should be able to handle simultaneous calls to the web server as well as the database. 95% of the transactions should be processed in under 3 seconds.

There will be approximately 50 to 60 groups, which will be about 200 students, attending the competition considering the past data and the growing scale. There will be at least 10 judges in total working on the grading, and it is expected that there will be 4 to 5 judges doing the grading at the same time. Therefore, we should support at least 12 to 15 connections at the same time to the server. For efficiency, the maximum response time should be 2 seconds.

## 3.4 Logical Database Requirements

The following information will be placed into the database:

The personal information of the students and judges who attend the competition. This information will be used very frequently, since we may need to show it on almost every web page. These information can also be divided into two groups by their confidentiality. That is to say, while all the personal information, including personal contact information, competition related information, should be visible to the students themselves who attend the competition, it does not necessarily be visible to other students. Same rule applies to the information of judges. The information of students and judges should be organized in a group level. This implementation makes the collaboration between students and also judges much easier, while it does not add unnecessary complexity to the users.

In addition, since this is an online grading system, we also need to placed the scores gotten by each group into the database. This information should be visible only to the judges before it becomes the final result. According to Dr. Mailer, it is very likely the judges will need to adjust the scores before making it the final one. This is because judges are not aware of what the average quality of work will be in the competition. Therefore, the score will experience three phases before being visible to everyone as a final result. In first phase, the score should only be viewable among a certain group of judges. After the judge group grading all the works from students, they can make it public to all the judges. This is the phase two when the judges may adjust they score according to the average performance of students. After all the adjustment, they can release the scores as the final result which are viewable by anyone, including students, judges and anyone who visits the webpage.

## 3.5 Design Constraints

### 3.5.1 Standards Compliance

The documentation for the HGE SS should follow IEEE format. All other conventions, such as naming, data format, etc. should be adhered to as outlined by the language in which it is written (i.e. C, PHP, Javascript).

## 3.6 Software System Attributes

### 3.6.1 Reliability

System should be simple to turn off and reboot should clear all data necessary so there is a clean slate for the next time it is rebooted.

System should be reliable so that spotty connection of wifi/internet should not be an issue.

System should be able to run android tablet with the add on.

### **3.6.2 Availability**

The HGE system should be available to run the entire time HGE occurs, and the administration site should also be up for 1-2 weeks before that. Nothing user-driven should be able to crash the network side of the HGE software suite, and the app side of the HGE software suite should be able to upload data at any time the network side is up.

### **3.6.3 Security**

The system will implement a login authentication system. Also, to enable user permission separation, the system will be subdivided into access levels with Administrator occupying the superuser access and judges and registrars splitting respective low level access. QR codes should be non-functional unless a logged-in judge scans a valid QR code generated by the administrator and/or registrar. No outside unauthorized user should be able to gain access to any part of the system. Should users be worried/forget their password, the ability to change passwords/send forgot password emails should be implemented. The forgot password link should be unique and expire after 24 hours (depth of forgot password link security TBD).

### **3.6.4 Maintainability**

The system should allow long periods of disuse and therefore should have minimal dependencies. If dependencies do exist, these dependencies should be stable and long term releases. The administrator will be provided several functions to clean and repair the database, enabling low upkeep. The system should be able flush all unnecessary data on-demand so it is ready to be used for the next HGE (clean slate).

### **3.6.5 Portability**

The Android app part of the HGE system should be designed for slightly older (legacy) Android systems, just in case not all provided tablets can run the latest stable version of the Android OS. The website part should be browser cross-compatible, and may be at least tablet-friendly.

## **3.7 Additional Comments**

Possible future features mentioned by the customer include the ability of a judge to see how many times a team has been judged and a priority list of teams that need judging.

## 4. Change Management Process

The change management cycle for the SRS document will be as follows:

- 1.) New requirements are made (via the customer) or are in need of change (via the customer or development).
- 2.) The modification is agreed upon by both the development team and the customer.
- 3.) The modification is added to the SRS document and is marked as pending awaiting approval.
- 4.) Once the document has been approved by all approvers detailed in Section 5, the SRS is officiated and updated to a new version.

## 5. Document Approvals

Dr. Sandeep Kuttal:

Signature:

Date:

## 6. Supporting Information

There is no supporting information necessary for the current state of the HGE SS.