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Algorithms for Sports Elimination

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Abstract

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Acknowledgements

We would like to thank our project supervisor, Dr. David Manlove, for his extensive guidance, knowledge, and support throughout the project. We would also like to thank all of the participants of our user evaluation during the evaluation stage of our project.

Education Use Consent

We hereby give our permission for this project to be shown to other University of Glasgow students and to be distributed in an electronic format. **Please note that you are under no obligation to sign this declaration, but doing so would help future students.**

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Wayne paper [1]

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3.4.1 Design

Introduction

This section discusses the design of the web-based version of the application. The design of the application was constructed with only the most important functional and non-functional requirements in mind. The web-based version was classed as the least important part of the project, with preliminary effort directed solely towards the desktop application.

System architecture

The web application is a standard multi-tier architecture with the presentation, logic, and data separated from each other.

The presentation tier is the client/browser who has Hyper Text Mark-up Language (HTML) and Cascading Style Sheets (CSS) for the static presentation of content. In addition there is JavaScript supported by JQuery JQueryUI for the dynamic user interface elements.

The logic tier runs on a web server called Lighttpd (pronounced lighty) that is supported by PHP: Hypertext Preprocessor (PHP). The logic tier has two data sources, a MySQL database containing the latest data and a Java jar for looking back at older data.

User interface

The user interface of the web application was intended on being as close to the desktop interface as viable within the constraints of a web browser and within the realms of what is typical layout of a web page.

DIAGRAM HERE

The web application has a single page containing the six available divisions. Each division is a table and only one is available for viewing. The reasoning behind this is to keep as much information 'about the fold' (above the lower page boundary on a browser's window).

There are links at the top of each page that will allow the user to traverse the entire date range for the season allowing them to view the scoreboard and elimination status at any point in time.

3.4.2 Implementation

Chapter 4

Evaluation

4.1 Evaluation

4.1.1 Introduction

After completing the implementation of the desktop and web based applications a thorough user evaluation was carried out of both systems. The user evaluation functioned as a reliable way to test the usability and likeability of both system designs. All usability testing preformed by the team was done in accordance with the University of Glasgow ethics procedures. The Evaluation was preformed in a three stage process.

Participant Brief

Starting with an introductory briefing, the team member conducting the evaluation introduced the test participant to the system, provided the user with a test number and a copy of the user test script and described the aims of the user evaluation that was about to take place.

During this stage the participant was asked to answer a few simple questions to gauge their competency using desktop and web based applications, and to gauge their personal interest in the systems domain -sports statistics- .

During the introductory brief, it was made clear to the participant that no personal or identifying information would be collected from them during the user evaluation. It was decided by the team that this would hopefully decrease the amount of participants who would not complete the evaluation fully and to ease the process of gaining eithical permissions from the university . Due to the fact that no test particapnts decided to stop the evalation half way through , and gaining ethical approval for the user evaluation was a simple process it was felt like this was a benifical desion .

In accordance with the universitys ethical prodedures during the introductory breifing the test participant were reminded of their right to stop the evalution at any time with no requirement to give reason. The user was then further reminded that it was not them, but the system that was under evaluation, and the user was provided with the contact details of the team member conducting the

evaluation. to allow the user to contact the team to answer any question or after thoughts that they had about the system or the user evaluation after it had been completed and they had some time to think on the process .

Think-Aloud (usability)

The evaluation was performed using the Think-Aloud technique which consists of participants performing a series of tasks set out to provide a complete overview of the full functionality provided by both the web based and desktop based Applications.

The test participants were encouraged to talk out loud as they preformed a series of tasks, designed to provide a full overview of the complete functionality provided by both systems

At this stage the role of the team member conducting the evaluation was to take note of any hesitation shown by the test candidate, possible confusion, or errors encountered when using the system. The reactions shown by the test participant when interacting with both the web based and desktop based Applications would clearly highlight usability problems which have went unseen in the teams initial systems design.

Questionnaire (likeability)

4.1 Desktop Application

Evaluation Results

4.2 Web Application

Evaluation Results

Chapter 5

Conclusion

5.1 Summary

5.2 Future Work

5.3 Lessons Learned

Chapter 6

Contributions

6.1 Gordon Reid

- Team leader
- Ford-Fulkerson algorithm
- Second user interface iteration
- Second parser iteration (in use)
- Post-second user interface iteration file opening.
- Web application user interface
- Web application back-end

6.2 Ryan Wells

6.3 Kristopher Stewart

6.4 David Selkirk

6.5 James Gallagher

Appendix A

Installation and Running of Application

A.1 Desktop Application

A.1.1 Installation

The desktop application requires the Java Runtime Environment (JRE) available from http://www.java.com/en/download/index.jsp. The application has been tested on JRE 6 and JRE 7 without issue.

The print functionality requires a LaTeX distribution that includes the executable 'pdflatex'. The installation procedure varies for each operating system and instructions are available from http://latex-project.org/ftp.html.

A.1.2 Running

After the Java Runtime Environment (JRE) is installed, running the application only requires double clicking the supplied JAR file.

The print functionality is executed within the Java application and thus is transparent to the user. In the event that the command 'pdflatex' cannot be found, the application will fail to print however will not crash. Print functionality is known to work on standard installations of the distribution on Linux/GNU-based and Mac OS operating system.

A.2 Web Application

A.2.1 Installation

Installation of the web application is not required as a remote host is running the required software. This can be accessed via http://www.gordonrenfrewshire.com/teamw. For purposes

of completeness and satisfying the potential desires of the reader, an installation procedure is supplied.

The web server has numerous standard applications running to service the web application. Each one is required for full functionality:

1. A web server (such as Lighttpd or Apache)
2. PHP (known to work on PHP 5.x)
3. Java Runtime Environment (version 6 or 7)
4. MySQL (version 5.x)

Installation of packages

The installation procedure assumes you have super user access on a Debian-based distribution. The official procedure for installation of a 'LAMP' (Linux Apache, MySQL, PHP) server is available from the Debian Wiki at http://wiki.debian.org/LaMp

Set up of database

COMMAND FOR DB CREATION HERE

SQL FOR CREATION OF TABLE HERE

In the folder 'website/content/php/includes/functions.php' there are a number of variables at the top of the page indicating the values for the server, user, password, and database. These can be modified to suit your requirements however the default are highly recommended.

A word of warning, the variable scope is very insecure and however was designed as such for simplicity of installation and testing. Please do not run the server code on a public or production server.

A.2.2 Running

As stated in the installation section, the web application is available for viewing at http://www.gordonrenfrewshire.com/teamw. If a personal installation has been executed then running the application will be dependent on your own set up.

Bibliography

[1] Kevin D. Wayne. A new property and a faster algorithm for baseball elimination. 14(2):223–229, 2001.