R Analytics Tool to Study the Performance of the D1 Women's Basketball Team at Sacred Heart University

Erica Juliano & Chelsea Thakkar
School of Computer Science & Engineering
Sacred Heart University, Fairfield, CT

Abstract

The R Analytics tool leverages the power of the R programming language, a versatile and widely used software environment for statistical computing, to provide a comprehensive and sophisticated analysis of the team's performance. Advanced statistical techniques are employed to generate insights into the team's performance and identify areas for improvement. The tool also integrates data from multiple sources, including game statistics, player performance data and other relevant information, to create a comprehensive picture of the team's performance. The goal of the tool is to support data-driven decision making and help coaches and staff at Sacred Heart University gain a deeper understanding of the team's strengths and weaknesses. By using this tool, they can make informed decisions about player development, strategy and tactics, and optimize the team's performance. In addition, the tool can also be used to monitor player performance over time and detect trends, allowing the team to make adjustments as needed to maintain a competitive edge.

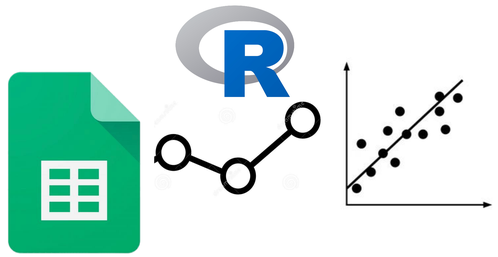

Figure 1: Google Sheets and R integration using R package {googlesheets4}

Dataset Description

- **The data log had to be hosted remotely in order to successfully display a dynamic UI.**
  - **googlesheets4 - Google Sheets and R integration**
- **The primary dataset is a data log of Sacred Heart Women's Basketball athlete activity collected by Sacred Heart University graduate assistants, strength coaches, and various wearable technologies**
  - **89 fields**
  - **Over 3,100 records, organized by entry date**
- **A secondary data set labeled "Login" was created for the user accounts.**
  - **3 Features – username_id, password, and permission**
- **A tertiary dataset labeled "Y-Variables" contains information regarding what the variables mean and what source they are coming from (WHOOP, training data from coaches, injury reports from medical staff, and weekly survey data).**

Experimental Results and Analysis

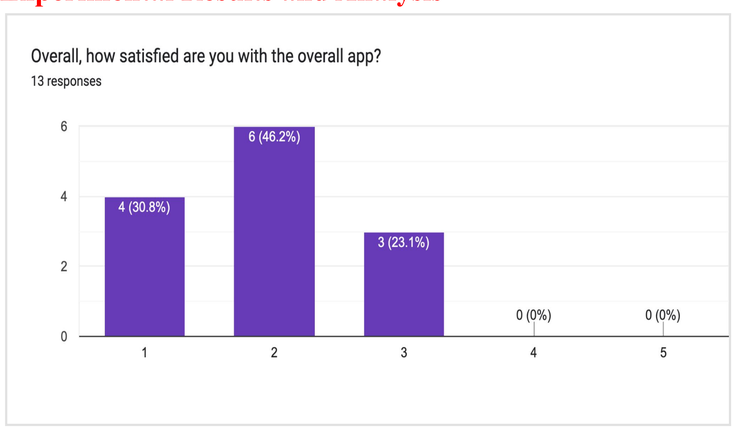

Figure 2: The overall results from the first round of user testing using a Likert scale where 1 corresponds to "Very Satisfied" and 5 corresponds to "Very Dissatisfied".

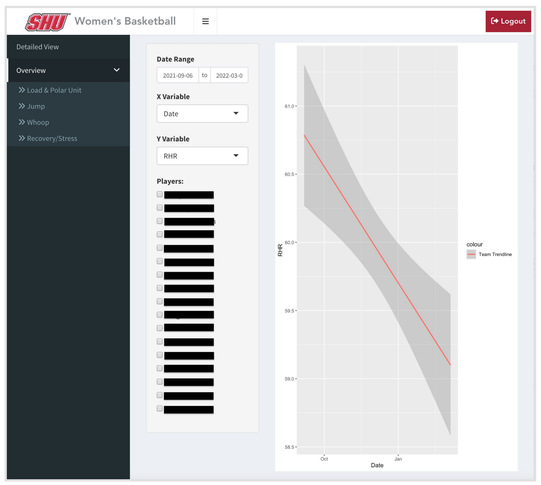

Figure 3: "Detailed View" Tab of a User with Login Permission "coach"

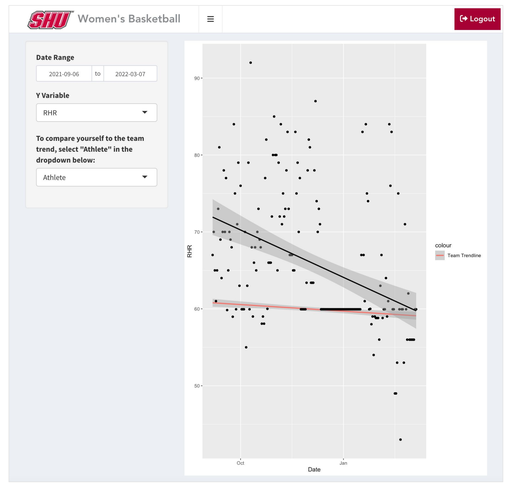

Figure 4: User with Login Permission "player"

Conclusion and Future Work

1. **The goal of the app is to support data-driven decision making and help coaches and staff at Sacred Heart gain a deeper understanding of the team's strengths and weaknesses.**
2. **Future upgrades to the app include a designated definition page that explains the variables, machine learning based predictions, and incorporating more graphics for a better user-experience.**

References

[1] S. Senbel, S. Sharma, M. S. Raval, C. Taber, J. Nolan, N. S. Artan, D. Ezzeddine, and T. Kaya, "Impact of sleep and training on game performance and injury in division-1 women's basketball amidst the pandemic," IEEE Access, vol. 10, pp. 15516–15527, 2022.

[2] C. Taber, S. Senbel, D. Ezzeddine, J. Nolan, A. Ocel, N. Artan, and T. Kaya, "Sleep and physical performance: A case study of collegiate women's division 1 basketball players,"