

## Proposal and Estimate

### Context

Reple is developing a web app that provides a variety of statistics (for example views over time for game streamers on twitch) to interested members of the e-gaming community (for example gaming companies who wish to sponsor e-gamers) using a range of data collected and maintained in a Reple database. In their next iteration of this web app, Reple would like to increase the functionality of their existing app by incorporating a recommender engine into the app.

### Problem Description

Broadly speaking, a recommender engine is an algorithm that uses collected data to make recommendations to a user. Typically, the recommendations are based on data about the user that has been previously collected. Using this data, the engine will generate predictions of other items that might be of interest, or relevance, to the user, which can then be presented to the user for consideration. Some engines might also provide a rank or rating of the selected items.

In the case of this project (while acknowledging that possible and feasible functionality of the engine must be further explored during the algorithm design preparation stage), the recommender engine might, for example, recommend games similar to other games that the app end-user has already selected, and suggest that these games might also be of interest to the end-user.

### Proposed Work

At the heart of the proposed work is the design of an algorithm for the recommender engine. Once successfully designed, this algorithm may then be implemented in the next iteration of the web app.

We recommend that the algorithm design process occur in a data analysis specific sandbox environment, because this environment will allow for rapid algorithm design and testing. The resulting algorithm will then be provided to Reple for integration into the implementation of the next iteration of their web app.

Proposed stages of the algorithm design project would be as follows:

- **Functional Requirements and Data Review**
- **Algorithm Design**
- **Algorithm Testing**
- **Provision of Algorithm and Secondary Deliverables**

A rough cost and time estimate for each of these stages will be provided below.

We recommend that the Design Preparation Stage, which includes a review of the collected data and an assessment of the potential of this data for use by recommender engines, be carried out immediately.

Based on the results of this audit, a decision can then be made about the feasibility, timing and structure of the following stages of the project.

## Description of Proposed Deliverables

### *Algorithm Design Deliverable*

The algorithm for the recommender engine will be initially designed in a data analysis specific environment and language (e.g. R, Matlab, Python or some combination of these, to be determined), to allow for rapid algorithm design and testing. To support subsequent implementation in the Repable data system, following the algorithm design sufficient algorithm detail will be provided in the deliverable to allow for implementation in other programming languages.

Based on the currently understood functionality, the algorithm will be constructed using existing recommender system methods, algorithms and techniques, adapted to the specifics of the supplied e-gaming data model and the specified web app functionality. Basing the algorithm on existing methods will also allow for rapid algorithm design.

### *Algorithm Results Deliverable*

In addition to the algorithm itself, we will provide a short report describing and visualizing the results of applying the algorithm to the supplied sample dataset. This will provide a more tangible understanding of the capabilities and behavior of the algorithm.

## Time and Cost Estimate

Stage	Point of No Return (to be done by May 13 <sup>th</sup> )	Cost Estimate
<b>Functional Requirements and Data Review</b>	April 8 <sup>th</sup>	2000\$
<b>Algorithm Design</b>	April 22 <sup>nd</sup>	10,000\$
<b>Algorithm Testing</b>	April 29 <sup>th</sup>	2000\$
<b>Deliverables Preparation</b>	May 13 <sup>th</sup>	1000\$

\*The Functional Requirements and Data review stage requires input from Repable, including a description of the e-sports domain, information on functional requirements and a data model. Time required to complete this stage will also depend on when these inputs are received

\*\*Algorithm testing requires as input sample data, so the time required to complete this stage will also depend on the availability of the sample data

This timeline is estimated based on the project starting in earnest after the Data Model (Data, Functional Requirements, and Domain Knowledge) being received by **March 5<sup>th</sup>**. Should that deadline fail to be met, we cannot guarantee the availability of our resources and the final delivery date could be compromised.