

Lab 1 - GameEye

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1. Introduction

1.1 Societal Problem

A societal problem that exists is that gamers lack a software solution that automatically tracks news updates on developing video games. Thousands of video games are released every year. The online gaming platform Steam released 9,050 games in 2018 (Gough, 2019). They also often have long development timeframes, which makes it tiresome to stay updated on so many games for a long period of time. For example, the popular shooting game Team Fortress 2 was in development for nine years before it was released in 2007 (Dietz, 2011). This societal problem is caused by inadequate game development monitoring solutions, decentralized news sources, lackluster news verification, and independent game developers having difficulty maintaining public attention. Even though this problem does have a current solution, it is too time-consuming to resolve the problem.

1.2 Solution Description

The superior solution to the problem will have a user-friendly interface, multifaceted accessibility, and customizability. It will be a platform where users search for and follow games that they may be interested in. This will simplify the process of searching for video game news because instead of going to various websites, the user will be able to access this platform to find the news that they are looking for. Users will even have their own personal watchlists to keep track of followed games.

1.3 Solution

The solution to the problem is called GameEye. GameEye will provide news notifications from multiple sources, a customizable notification system, self-organization, links to full sources, and a web application. GameEye will keep track of any game a user chooses to

follow and will notify them when new content on a game they followed is released online. GameEye will use machine learning to classify news articles, tweets, Reddit posts, videos, images, and updates depending on what they are about. Machine learning will also analyze news articles, tweets, Reddit posts, videos, images, and updates and assign a multi-factor score depending their importance to a specific user.

2. GameEye Product Description

GameEye is a web application that will connect video game fans with news notifications about video games in development. A user will set up their account to monitor specified games in order to receive news and information about said games. GameEye will have many key product features and capabilities that will be implemented via various hardware and software.

2.1 Key Product Features and Capabilities

The key product features and capabilities of GameEye are general features, authentication, account management, game tracking, searching, web scraping, notifications, settings, and machine learning. General features include cross-platform support on desktop and mobile devices based on progressive web application (PWA) technologies, offline support, local caching, and connectivity interruption resiliency features. Authentication includes secure user login and registration, external provider user login and registration (e.g. with social media accounts), persistent sessions that do not require a user to login every time they open the app, two-factor authentication, which allows increased security, and password recovery mechanisms. Account management includes the ability for users to change their passwords, the ability for users to modify their profile information, and the ability for users to delete their accounts. Game tracking includes personal watchlists, which display thumbnails next to a game's title, new updates organized by important updates, news articles, tweets, Reddit posts, images, and videos

with thumbnails for news articles and tweets, and a list of the most-watched games by users. Searching includes support for autocompletion of a search query. Web scraping involves going online and pulling images, videos from official game YouTube channels, and information from news articles from video game news websites, tweets from official game Twitter feeds, and Reddit posts from official game subreddits. Notifications include cross-platform push notifications for new game updates, a user interface (UI) count of notifications for each game and resource category, and suggested video game notifications based on a user's most-watched games list. Settings include the option to see archived resources, the option to see importance scores for news articles and tweets, the option to receive notifications and being able to choose which resource categories to be notified about, and the ability to submit feedback. Machine learning is used to classify game updates, assign importance scores for news articles and tweets, and extract important information for news articles and tweets.

2.2 Major Components

The major components of GameEye include hardware and software. Hardware consists of the frontend server, the main backend server, the web scraping backend server, the machine learning backend server, and the main database server. Software consists of frontend software (i.e. WebStorm IDE, Angular Framework, Google Workbox containing PWA libraries, Hypertext Markup Language (HTML), SASS, Cascading Style Sheets (CSS), and TypeScript), backing software (i.e. IntelliJ IDEA IDE, Spring Framework, jsoup library for web scraping, and MongoDB Java Driver), testing software (i.e. JUnit Java Framework and Jest JavaScript Framework), machine learning software (i.e. Python, Keras, which is a deep learning library, scikit-learn library, and TensorFlow Serving, which is a model server), natural language processing software (i.e. Python and spaCy library), databases (i.e. MongoDB, MongoDB

Compass, which is the graphical user interface (GUI) for MongoDB, and IGDB REST API), and 3rd party software (i.e. Auth0 Single Page App SDK and Firebase Cloud Messaging, which uses Firebase Admin Java SDK). Some of these components are listed in the Major Functional Component Diagram (MFCD) below.

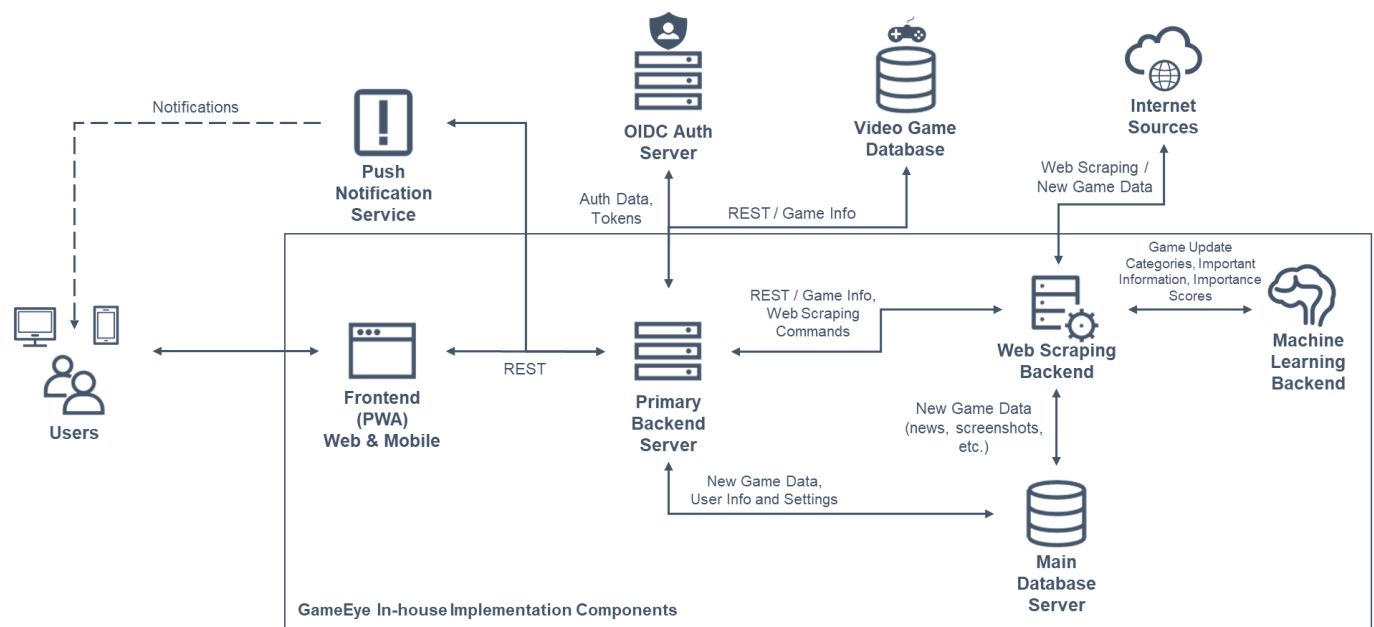


Figure 1: GameEye's Major Functional Component Diagram – The components featured in this diagram as listed above are the frontend server, the main backend server, the web scraping backend server, the machine learning backend server, and the main database server.

3. Identification of Case Study

GameEye is for gamers who want to stay notified on upcoming games that they are excited for and want to keep track of games that have upcoming releases or already released. In 2014, there were almost 1.82 billion gamers worldwide. This figure is steadily increasing, as it is expected to rise over 2.7 billion by 2021 (Gough, 2019). People that want to become gamers in the future may be interested in the app.

4. Glossary

List of terms and abbreviations:

Angular Framework: Platform for building mobile and desktop applications.

API: Application Programming Interface; a set of functions and procedures allowing the creation of applications that access the features or data of an operating system, application, or other services.

AWS: Amazon® subsidiary that provides on-demand cloud computing platforms and APIs

CSS: Cascading Style Sheets; used to stylize webpages.

Guest: Initial role for users who have not created an account on GameEye.

Hitlist: List of highly watched video games by users.

HTML: Hypertext Markup Language; used as markup for documents meant to be displayed in a web browser.

IGDB: Database of known video games, accessed by REST API to populate GameEye's database

Indie Games: Games developed by individuals or smaller teams of people without the financial support of larger game publishers.

IntelliJ Idea: IDE developed by JetBrains to write Java applications and will be used in the back-end development of GameEye.

JavaScript: Object-oriented language used to create dynamic, interactive effects on webpages.

Jest JavaScript Framework: Testing framework maintained by Facebook Inc.

JSoup Library: Java library for working with real-world HTML.

JUnit Java Framework: A testing framework for Java.

Keras (Python Deep Learning Library): Open-source neural-network library written in Python.

MongoDB: A cross-platform document-oriented database program

Noise Filtering: Information/news articles shown that caters to an individual's content preferences.

OIDC Authentication: Authentication protocol based on the OAuth2.0 family of specifications.

PWA: Progressive Web Application; a type of application software delivered through the web, which is built using common web technologies including HTML, CSS, and JavaScript.

Python: Interpreted, high-level, general-purpose programming language.

REST: Software architectural style used in creating web services.

RSS Feed: Web feed that allows users and applications to access updates to websites in a standardized, computer-readable format.

Scikit-learn Library: Software machine learning library for the Python programming language.

SpaCy Library: Open-source software library for advanced natural language processing.

Spring Framework: Application framework and inversion of control container for the Java platform.

Tester: GameEye beta testers; users of the application in its prototype phase who will provide feedback on their experience.

Web Scraping: Data scraping for extracting data from websites.

WebStorm: IDE developed by JetBrains to write JavaScript code.

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