

**Diablo III BuildMark**

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**Revision History**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Author** | **Company** | **Date** | **Version** | **File Name** | **Comments** |
| Alex Carlson | AC software | 10/15/2014 | v0.10 | Diablo III BuildMark – Draft – W7.docx | Title page, legal, and copyright notices created. |
| Alex Carlson | AC software | 6/5/2014 | v0.20 | Diablo III BuildMark – Final Draft – W10.docx | Spelling, Software, Hardware, and data descriptions updated. |
| Alex Carlson | AC software | 10/6/2015 | v1.0 | Diablo III BuildMark 1.0.docx | Updated requirements specifications for connecting a profile with a battle.net battletag (section 4.1.2.A.i) |
| Alex Carlson | AC software | 10/19/2015 | v1.1 | Diablo III BuildMark 1.1.docx | Added requirement specifications for searching (section 4.1.8) |
| Alex Carlson | AC software | 10/20/2015 | v1.2 | Diablo III BuildMark 1.2.docx | Added requirement specifications for account settings (section 4.1.1.B) and removed some redundant requirement specifications (sections 4.1.3.B and 4.1.3.C are covered by 4.1.4 and 4.1.5) |

**Signature Page**

This document accepted by:

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Signature (Calvin Caldwell) Date

This document submitted by:

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Signature (Alex Carlson) Date

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**1. Introduction**

**1.1 Purpose**

The purpose of this document is to propose the requirements, design, and implementation for the Diablo III BuildMark software application. The following pages are intended to concisely describe the project, the application, and its design. If the proposal is accepted, this document will act as an outline for each step throughout the process leading up to the project’s completion.

**1.2 Scope**

The scope is limited to project management, product description, and the project’s requirements. These topics include tools, methodologies, clearly defined features and requirements, as well as explain how the project implementation will be managed throughout the project.

**1.3 Intended Audience**

The intended audience for this document is Calvin Caldwell, the employees of AC software, and users of the Diablo III video game application.

**2. Project Management**

**2.1 Change Management Procedure**

In the event there is a change request to modify the system, the Change Administration Team (CAT) must submit a change request form and authorized by all members of the team. This team consists of Calvin Caldwell and Alex Carlson.

Change orders must be submitted in hard copy with required signatures from all members of the CAT team in order for approval. Upon submission of a change order, the request must be responded to within 5 business days. CAT members and Change Management Procedure requirements may be changed in this manner.

The change order request will include any and all section of this proposal to be modified in detail. If applicable, an impact analysis (including deadline changes) should be included with the Change Request Form at the time of submission. An impact analysis, if not included, may be requested by a member of the CAT. In this case, an additional 2 business days will be added to the response time in order to complete the impact analysis.

All change requests will be catalogued in Appendix B of this document, regardless of whether the request was approved or denied. Each form submitted will have a documented submission date and request finalization date, with the necessary signature from the head of CAT to approve or deny the request. All signed forms will be scanned and included with the current and future revisions of this document.

**2.2 Software Delivery, Installation, and Acceptance Criteria**

The finished software application will be delivered by the last week of Winter Term of the 2015 – 2016 academic year. The deliverables will include a copy of all implementation for the project, as well as help content, documentation, and the web address for the implemented webpage.

**2.3 Documentation and Online Help**

Software documentation will be provided in written format. Documentation provided will detail the system requirements, startup process, and operation of the software described by this document. Documentation on the software’s use will be embedded into the final website in the form of a help page.

**2.5 Project Risks**

The project depends heavily on the battle.net API for obtaining item data and assets from the game’s servers. The complexity and volume of these items presents a major challenge for the project’s development. AC software has never implemented a live website and will require some extra research on web-hosting which could create some delays.

**2.6 Customer Responsibilities**

The customer will be responsible for providing their own internet browser software and internet connection. The officially supported web browsing clients are Google Chrome and Internet Explorer.

**2.7 Status reporting**

Status reports will be written and submitted to Professor Calvin Caldwell every week by 5:00 pm on the Friday of that week. Each status report will contain details regarding all work accomplished over the one week time frame. Any problems encountered and their solutions will be included in the report as well. A tentative plan for the next one week period of time will also be included.

**3. System General Description**

**3.1. Problem Statement**

Diablo III is a PC game with a very complex set of items and ways to use those items. Determining the best way to use those items is done with some basic numbers that are calculated by the game, but with the use of the game’s API, could be done much more comprehensively.

There are 11 types of gear in Diablo III, some have sub-categories that are class-specific, and some items form set bonuses when combined with others. Each hero has 13 equipment slots and even two of the same item can vary wildly in their attributes, so the combinational complexity is extreme.

Blizzard has done a great job supplying players with calculated values for basic attributes like damage per second (DPS), toughness, and healing, but one huge void of information is a hero’s actual, practical DPS. Between the different attributes like attack speed, area damage, and bonuses vs. certain types of opponents, there is currently no good way to calculate a hero’s actual DPS.

**3.2. Perspective**

**3.2.1. History**

Diablo III is an Action/Adventure PC game created by Blizzard Entertainment. The premise of the game is simple: fight demons and collect gear. The gear is randomly generated based on some fairly straight-forward constraints. The better the gear the player finds, the further that player can progress in the game.

The game is strictly an online game as all hero information is stored on the Blizzard servers. Data can be publicly retrieved for any user with the Blizzard API.

**3.2.2. Background**

AC software is primarily experienced with programming in C, C++, and C#, and has some experience with ASP.NET, Cascading Style Sheets, Windows Forms, and Windows Presentation Foundation.

**3.2.3. Prior Release**

There have been no prior releases to this project as of the time that this was written.

**3.3. Major Subsystems**

There are three major subsystems for the project: the presentation layer, business layer, the database layer.

**3.3.1. Web UI**

The web-user interface consists of multiple web-pages and will serve as the sole interface between the users and the system. These pages will allow the user to access user registration, login, data viewing, and data saving/storing.

**3.3.2. Business Layer**

The business layer provides the proprietary code-base and data structures for the system. Benchmarking and interactions between the user and the database are both handled by the business layer.

**3.3.3. Database Layer**

The presentation layer consists of multiple web-pages and will serve as the sole interface between the users and the system.

**3.4. Relation of System to Existing System(s)**

Third-party Diablo III build assistance tools are available online. These third-party systems make use of the Battle.net API and offer various features similar to those contained in this system with the exception of the benchmarking tools and build comparisons.

**3.5. Hardware Platform Description**

The hardware required to use this system is a PC with a 233 MHz CPU, 64 MB of RAM, 200 MB of hard disk space, and an internet connection.

**3.6. Software Platform Description**

The software required to use this system is either Internet Explorer version 8.0 and higher or Google Chrome version 20 and higher.

**4. Product Requirements**

**4.1. Functional**

**4.1.1. The system shall supply the user with a web-interface supporting user logins.**

A. The website shall provide a registration page.

i. It shall require a unique username at least six characters long.

ii. It shall require the user enters a new password twice.

a. Both passwords must be at least six characters long.

b. Both passwords must match.

iii. It shall check the database for pre-existing account information.

iv. It shall store valid, unique user login information in the database.

a. The username.

b. The hashed password.

iii. It shall direct the user to the login page upon successful registration.

iv. It shall display warning text when a user attempts to enter invalid information.

B. The website shall provide a login page.

i. It shall require a username.

ii. It shall require a password.

iii. It shall hash the password and check against existing password in the database.

C. The website shall provide an account settings page for editing account information.

i. The user’s password.

ii. The user’s battle.net profile.

**4.1.2. The system shall support viewing and storing of a user’s battle.net profile.**

A. The website shall provide a profile viewing page.

i. It shall allow the user to connect the profile with its battle.net battletag.

ii. It shall display one profile per registered user.

iii. It shall display the profile’s battletag.

iv. It shall display a list of all heroes belonging to the battletag.

a. Each hero listed shall display the hero’s name.

b. Each hero listed shall act as a link to the hero build viewing page (4.D).

B. The database shall store the user’s battle.net battletag (for use with Blizzard API).

C. The database shall store a list of the user’s heroes.

**4.1.3. The system shall allow viewing of all user’s hero builds and their saved states.**

A. The website shall provide a hero build snapshots viewing page.

i. It shall display the hero’s name.

ii. It shall display the hero’s attribute values.

a. Strength, Dexterity, Intelligence, Vitality, Damage, Toughness, Recovery, and Life.

iii. It shall display the hero’s build.

a. A list of all four of the hero’s passive skills.

b. A list of all six of the hero’s active skills.

**4.1.4. The system shall allow saving a hero’s build state at any time chosen by the user.**

A. Saving a hero’s build uses the Blizzard API to acquire the hero’s current build.

B. Saving a hero’s build adds it to a list of build states stored in the database.

**4.1.5. The system shall allow comparing saved build states.**

A. The website shall provide a page for comparing build states.

i. It shall provide two drop-down lists of saved build states for the current hero.

ii. It shall provide two of the current hero’s build states side-by-side.

iii. It shall allow changing of either build state to a different build state.

iv. It shall highlight attributes that are greater than those of the other build.

**4.1.6. The system shall provide benchmark numbers for a given build.**

A. The website shall display benchmark information on the build viewing page.

i. It shall provide a button for calculation of a benchmark for each build state.

ii. It shall provide two arbitrary benchmark numbers indicating build effectiveness.

a. A number indicating the build’s single-target effectiveness.

b. A number indicating the build’s multiple-target effectiveness.

B. The benchmark information will be retrieved from the database.

**4.1.7. The system shall provide a benchmarking tool for calculating build effectiveness**

A. The server will process benchmarks in a queue, being added by the users.

B. The server will run a series of simulations on each build in the queue.

i. A simulation testing the build’s defense against a series of opponents.

ii. A simulation testing the build’s offense against a series of opponents.

iii. A simulation testing both defense and offense together against a series of opponents.

C. The database will be updated with benchmark results on completion of each benchmark.

**4.1.8. The system shall provide searching for users and hero builds**

A. The website shall provide a search field in the navigation bar.

B. The website shall provide a page for search results.

i. The page shall provide a list of links to found profile and hero pages.

**4.2. Performance**

The performance between user and system depends on the user’s internet connection. The performance of the site depends on the hosting platform chosen which has yet to be determined. A time delay is expected when the server is running benchmarks as these are placed into a queue. The processing time associated with benchmarks possibly requires the user to check back at a later time.

**4.3. Reliability**

The website is as reliable as the hosting platform. When the host is live, the website operates reliably for all users within the aforementioned performance guidelines.

**4.4. Data Description**

Login data is transferred between the user and the database via the business layer and consists of username, hashed password, and session information such as cookies.

Hero build data is retrieved via the Blizzard API as a JSON file with a size of roughly 30 KB for each build.

Hero and build data is transferred between the user and the database via the business layer. These data are retrieved one build at a time. If a build has many build states, these will all be transferred to the client all at once to reduce wait time for the user. Each build state stored in the database contains roughly 30 KB of data. A hero with about 50 build states creates a 1.5 MB transfer taking less than a second from database to server. There is no limit to how many build states are stored for any given hero, so transfer rates will vary. Only one or two build states will be sent from the server to the client at one time.

Build benchmark data is stored as a single integer for each build in the database and are stored in the database by the server upon benchmark completion.

**4.5. Security and Safety**

User’s account will be secured with the use of hashed passwords. All hero and build data is secured with user login sessions.

**4.6. Constraints**

AC software expects user’s to adhere to the terms of service as they appear in the official documentation.

**5. User Profiles**

This website’s end-users are individuals that play Diablo III and want to improve their gaming experience by viewing a history of information relevant to their hero’s builds and efficiency.

**Appendix A – Glossary of Terms**

**Appendix B – Change Request Form**

Change request form on next page.

Submitted By: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_

Change Request:

Purpose for Change Request:

Additional Comments:

Accepted By: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_

Denied By: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_

**Appendix C – Change Requests**

No Change Requests yet submitted.