

# Hearthstone

## Software Requirements Specification

### Document

Author: Jennifer Felton

**Version: (2.0)**

**Date: (12/12/19)**

## **Table of Contents**

### **1. Introduction**

- 1.1 Purpose
- 1.2 Scope
- 1.3 Definitions, Acronyms, and Abbreviations
- 1.4 References
- 1.5 Overview

### **2. The Overall Description**

- 2.1 Product Perspective
  - 2.1.1 Interfaces*
  - 2.1.2 Hardware Interfaces*
  - 2.1.3 Software Interfaces*
  - 2.1.4 Communications Interfaces*
  
- 2.2 Product Functions
  - 2.2.1 Log in*
  - 2.2.2 Main Menu*
  - 2.2.3 Store*
  - 2.2.4 Game Play*
- 2.3 User Characteristics
- 2.4 Design Constraints
  
- 2.6 Apportioning of Requirements

### **3. Specific Requirements**

3.1 External interfaces

3.2 Performance Requirements

3.4 Logical Database Requirements

3.5 Standards Compliance

3.6 Software System Attributes

*3.6.1 Reliability*

*3.6.2 Availability*

*3.6.3 Security*

*3.6.4 Privacy*

*3.6.5 Maintainability*

3.7 Additional Specific Requirements

3.7.1 System Mode

3.7.2 User Class

3.7.3 Objects

### **4. References Used**

## **1. Introduction**

*“In Hearthstone, you play the hero in a fast-paced, whimsical card game of cunning strategy. In minutes, you'll be unleashing powerful cards to sling spells, summon minions, and seize control of an ever-shifting battlefield.” ~Blizzard Entertainment*

### **1.1 Purpose**

The purpose of this Software Requirements Specification is to specify in detail the interface design, gameplay details and software requirements of the Hearthstone app created by Blizzard Entertainment. This SRS is intended for developers, users and stakeholders to understand the design of the Hearthstone Application.

### **1.2 Scope**

Hearthstone is an online, multiplayer card game where players compete against each other or the computer to move up the rankings system. Hearthstone's base game is free, with additional expansion packs and cards available for purchase. The goal of the app is to create a game that users enjoy, allowing Blizzard to create additional income from in-game purchases, outside of the game franchise purchases, and other related revenue streams.

Hearthstone is designed to be played on desktop computers and mobile devices. The Hearthstone app contains the software necessary to play the game and access the in-game store.

### **1.3 Definitions, Acronyms, and Abbreviations.**

Player: the person controlling the game

Inn: a place in World of Warcraft where players often "hearth" to (port back to) using a hearthstone

WoW: World of Warcraft

card: the virtual cards used to play the Hearthstone game

### **1.4 References**

All references used in creating this SRS are listed at the end of this SRS

### **1.5 Overview**

This SRS contains the specifications of Hearthstone's features and designs. Players, potential players and stakeholders will find Section 2: The Overall Description, most helpful. Software Developers and Project Managers may find Section 3: Specific Requirements to be more useful since it contains detailed Specific Requirements of the app.

## **2. The Overall Description**

This section contains an overall description of the Hearthstone App. This section is split into two main topics, Product Perspective and Product Functions.

The Product Perspectives section (2.1) describes the main design principles that are critical to the design of the app. It contains the information that must be kept in mind while designing the different parts of the app, such as the interfaces, memory constraints and operations.

The Product Functions section (2.2) describes how the app should work. This explains the different menus, game modes, and player screens that will be created.

### **2.1 Product Perspective**

Hearthstone is designed to be an independent, stand alone game. It requires no other products outside of the Blizzard Battlenet Launcher to run. Although Hearthstone draws on characters and ideas from World of Warcraft (WoW), knowledge of WoW is not required to play or enjoy the game.

Hearthstone was designed with the following design principles as a priority:

- Immediate fun for the new player
- Allow non competitive players to thrive.
- Keep it Simple- make what is cool about card games more accessible
- Keep it Deep- remove complexity and not depth
- Simple Cards, Complex Interactions
- Embrace the Medium of the digital space

- Don't change too much
- Support player stories
- Emotional Design Matters
- Little Victories

### **2.1.1 Interfaces**

Hearthstone is a GUI based game. All menus and sub menus are GUI based and no user typed input is needed. All GUIs are styled to look like you are playing in an Inn in the World of Warcraft, with a box that contains your cards and other game essentials. All menu changes and actions are animated. This rustic and warm Inn vibe is consistent throughout the entire app.

In keeping with the main design priorities, all text is kept short and understandable on all menus and cards. This keeps the player immersed in the game and not struggling to understand what is happening. All menus with buttons include informational text that pops up when the button is moused over or long-pressed with touch.

ADA Compliance: Video games are not covered by the ADA and therefore, Hearthstone does not have to follow ADA website regulations. Hearthstone does not contain audio prompts for visual disabilities, nor a color blind mode. The text is unable to be enlarged. The audio in Hearthstone is largely unimportant and does not affect gameplay at all. Not all audio is subtitled. Player to player communication is all text based. Since Hearthstone can be played for free, users can try out the game and see if they are able to play before making any purchases. Users who are looking to play with modifications should check [ablegamers.org](http://ablegamers.org) to see if they may be able to assist.

### **2.1.2 Hardware Interfaces**

Hardware Interfaces and requirements are kept low so more players can play without having to invest in a high-end gaming computer. It is also kept low so it can be played on mobile devices.

For Windows PC, Hearthstone's minimum requirements are:

- CPU: Intel Pentium D or AMD Athlon 64
- RAM: 3 GB
- OS: Windows 7/Windows 8/Windows 10
- Graphics Card: NVIDA GeForce 8600 GT or ATI Radeon HD 2600 XT
- Free Disk Space: 3 GB Hard Drive Space
- Input: keyboard and mouse, or touchscreen
- Resolution: 1024x768

For Mac, Hearthstone's minimum requirements are:

- CPU: Intel Core 2 Duo
- RAM: 2GB
- OS: OS X 10.12
- Graphics Card: NVIDA GeForce 8600 GT or ATI Radeon HD 2600 XT
- Free Disk Space: 3 GB Hard Drive Space
- Input: keyboard and mouse, or touchscreen
- Resolution 1024x768

For Android, Hearthstones minimum requirements are:

- OS: Android 5.0 (Lollipop) or Fire OS 5.0 or later
- Processor: 1.2 GHz or better
- RAM: 1 GB
- Memory: 4GB of internal hard drive space or 1 GB internal/4GB external

For iOS, Hearthstone's minimum requirements are:



- iPad Air or newer
- iPad 4 or newer
- iPad mini 2 or newer
- iPhone 5S or newer
- iPod Touch 6 or newer
- iOS 9.0 or later

### **2.1.3 Software Interfaces**

Hearthstone must interface with MySQL, Oracle and MS SQL to manage player statistics, game statistics, player card sets, gamewide card sets, expansion data and game data. Without a solid database structure, Hearthstone will be difficult to manage. Blizzard uses the same relational database management systems across all their games, so Hearthstone must make use of the same systems.

All in-game artwork is created using Photoshop, Maya and in-game FX systems.

### **2.1.4 Communications Interfaces**

There is no free-inout player communication interfaces specific to Hearthstone. All communication between players in the app are done by pre-defined emotes. This cuts down on abusive actions and trolling. Emotes are on a timer and are not able to be spammed.

Hearthstone must integrate Blizzard Battlenet chat into the player interface. This allows players to stay in contact with their friends who are playing other Blizzard games. The Battlenet chat connectivity also allows players to spectate their friends Hearthstone games.

Languages:

Hearthstone Android supports English, French, Dutch, Spanish and Simplified Chinese.

Hearthstone iOS supports English, French, Dutch, Spanish, Italian, Portugues, Polish, Russian, Korean, Chinese (traditional and simplified), Japanese and Thai.

## **2.2 Product Functions**

This section lists the main functions of the Hearthstone game and describes how gameplay will work.

**2.2.1 Log in:** Players log in through the Battlenet app while on a PC. On mobile, users are prompted to log in using an existing log in, or to use facebook. If users have an authenticator on their account, it will prompt the user for the code, or prompt the user to select “authorize” or “Deny” on the authenticator mobile app.

Once a Player is logged in, the number of Blizzard Battlenet friends is shown in the top left corner of the app. At the top right, battery life, number of dust and the option gear are always showing. These options persist through all menu selections.

**2.2.2 Main Menu:** On login, returning Players are taken directly to the main menu. New players are given additional pop up screens. One is a choice as to what card selection mode do they want. Standard allows only Basic, Classic and the last 2 years of cards to be used. Wild allows all cards to be used. There are additional screens that specify which cards are included in the wild decks.

The main menu has buttons that either show options, or take the Player to another sub-menu. The main menu screen consists of the following options:

Play: launches the menu to select a deck

Solo Adventures: launches the menu to select an Adventure

Tavern Brawl: launches the Tavern Brawn menu

Modes: shows option for Arena or Battle ground mode

Quests: shows Players their quest details

Shop: takes Players to the store menu

Open Packs: takes Players to their packs

My collection: takes Players to the main page of their collection

**2.2.3 Store:** The store offers many choices for Players to purchase in-game cards and expansions. Checkout is completed in app. In the mobile app, checkout is completed using Google Pay and Apple Pay. On PC, it is completed with all major credit cards and Blizzard gift cards. Single card packs can be purchased by using in game dust, which players create from duplicated cards.

The store main menu shows all the main packs and expansions available. When clicking on a pack for purchase, a small overlay shows with more information, pack or expansion pricing, legendary card details, and an “i” icon for players to get purchasing information. Purchases are completed when the Player chooses the “BUY” button. There is an additional step of confirming payment before the purchase goes through.

The following are some of the items for purchase:

- Welcome Bundle- 10 classic packs for \$4.99
- Sylvanas Windrunner Hero set for \$9.99
- Tyrande Whisperwind Hero set for FREE
- Card packs for each expansion. There are a total of seven expansions currently available for purchase. This pricing strategy will be referred to as “Choose by the pack pricing” through this section.
  - 1 pack is 100 dust
  - 2 packs \$2.99
  - 7 packs \$9.99

- 15 packs for \$19.99
- 40 packs for \$49.99
- Solo Adventures. There are two adventures available
  - Saviors of Uldum for \$14.99
  - Rise of the Shadows for \$19.99
- Wild Card Packs. These are grouped by year.
  - Year of the Mammoth
    - Kobolds & Catacombs- Choose by the pack pricing
    - Knights of the Frozen Throne- Choose by the pack pricing
    - Journey to Un’Goro- Choose by the pack pricing
  - Year of the Kraken
    - Mean Streets of Gadgetzan- Choose by the pack pricing
    - One Night in Karazhan- \$19.99
    - Whispers of the Old Gods-Choose by the pack pricing
  - Wild Years 1 & 2
    - The League of Explorers- Choose by the pack pricing
    - The Grand Tournament- Choose by the pack pricing
    - Blackrock Mountain- \$24.99
    - Goblins vs Gnomes- Choose by the pack pricing
    - Curse of Naxxramas- \$24.99

**2.2.4 Game Play:** When Players press the play menu, they will be brought to the deck selection screen. This screen shows the different decks that the Player has created. It also shows in the top right corner the game mode choice (casual or ranked) . After a Player has selected their deck, the hero appears in the window on the right side of the screen and the play hearthstone is illuminated. Helpful tips pop up for new users, and for returning users who haven’t played in over 3 months.

After selecting play, a screen comes up showing a spinning slot machine. This spins while the computer is searching for an opponent. This gives the software time to search for another player and not make the Player think nothing is happening.

At the start of the game, a random board is chosen. The game boards have different artwork, but they all have the same standard layout. On the corners of the board are different art pieces. When interacting with these, they do different animations. On the left of the board is the history. This shows with graphic icons the moves each player has made. On the left is the end turn button. While the other player is having their turn, this button shows “ENEMY TURN”. At the top of the screen is the enemy player and their hero token. At the bottom is the Player’s hero and token, and the hand the player was dealt. Hovering over the cards shows the card in enlarged detail. Each hero begins with 30 hit points, shown on the bottom of the hero portrait.

Gameplay consists of two Players taking turns attacking each other with the cards in their hands. Play continues until one Player’s hero’s health reaches 0. Each player has 75 seconds to make their choices before their turn is up. A burning rope is shown 10 seconds before the turn is officially up. A buffer, known as slush, pads the timer to account for animation time and client-server differences. There is a limit of 89 turns in a game. On the 90th, the heroes both explode and the game is a draw.

When the game is over, a splash screen is shown announcing the win, loss and any other pertinent information. Then the Player is directed back to the play menu, so the Player can choose another deck to play.

### **2.3 User Characteristics**

Hearthstone was designed for players of all ages and gaming abilities. Gameplay is set up so casual players can easily pick up the game and have a good time. Hardcore players can

still find engaging depth and complexity. Players must have a Blizzard Account and an Internet Connection.

There are approximately 100 million Hearthstone accounts, with approximately 400,000 downloads in November 2019.

The ESRB rates Hearthstone as T for Teen due to alcohol reference, blood, fantasy violence, mild suggestive themes. It also is rated Teen for User interactions and In-Game Purchases.

## **2.4 Design Constraints**

Hearthstone must be able to be played on phones, tablets and desktop computers. All design must be constrained to working well on a variety of different devices and screen sizes. The memory size must be kept low. All user interactions must translate to touch screen, keyboard and mouse.

## **2.5 Apportioning of Requirements.**

There are no design requirements that can be delayed until future versions of Hearthstone. The base game, store, card organization and heros must be created before shipping. Additional cards, solo adventures and expansions can be released in the future, but are not critical to gameplay.

## **3. Specific Requirements**

The following section describes the specific software requirements for the Hearthstone App. It contains information for software developers to create and maintain the app.

Hearthstone is created using the Unity3d game engine. It uses the C#, C++ and Python programming languages.

All version control, application lifecycle management, and agile planning management is done with Perforce. The development environment is designed on Linux.

### **3.1 External Interfaces**

Hearthstone requires no external interfaces.

### **3.2 Performance Requirements**

The Hearthstone App uses battery power efficiently in a way that does not cause the devices to overheat or drain the battery rapidly. There are no in-game ads that would cause any unrelated background processes to run, or to cause unnecessary ghost battery drain.

To further save on battery drain, the screen will turn off after 30 seconds. Players will be logged out of the game after 15 minutes.

Hearthstone is fully functional over IPv6-only networks as well as IPv4 networks.

Hearthstone must maintain a 100% uptime. Uptime is measured and monitored 24 hours a day, 7 days a week, 365 days a year at Blizzard corporate offices in Irvine, California. All network app downtime issues are immediately reported to the network command center and corrected as soon as possible, usually within the hour.

Maintenance and patch updates are done on Tuesday mornings between 5:00AM and 7:00AM, Pacific Standard Time. Players are notified 3-4 days in advance through Battlenet messaging and in-app notifications.

### **3.3 Logical Database Requirements**

Hearthstone uses MySQL, Oracle and MS SQL for their database systems.

### **3.5 Standards Compliance**

Hearthstone complies with all Google App Store and Apple app store application rules and regulations.

### **3.6 Software System Attributes**

Hearthstone is created using the Unity3d game engine. It uses the C#, C++ and Python programming languages.

All version control, application lifecycle management, and agile planning management is done with Perforce.



### **3.6.1 Reliability**

Reliability refers to the ability of a software component to consistently perform according to its specifications. A reliable product is free of technical errors. Hearthstone is created and tested to meet up to Blizzard Entertainment's high standards of app reliability.

Hearthstone will be over-engineered to meet more than the minimum requirements for server-load and network-load. All Systems will be redundant in case of failure of one or more systems. Engineers are on site and on call 365 days a year to handle all emergencies.

All data will be backed up at multiple locations to account for hardware malfunctions, natural disasters, political upheaval and acts of God. Data archiving will keep backups of important data and logs in case of audit or recovery needs.

All of Heartstone's servers have battery backup in case of a power outage, to allow all hardware to safely shut down.

### **3.6.2 Availability**

Availability will be 24 hours a day, 7 days a week, with constant uptime. Downtime is always scheduled for Tuesday mornings, Pacific Time.

### **3.6.3 Security**

Hearthstone has implemented security measures to ensure proper handling of user information and to prevent its unauthorized use, disclosure, or access by third parties.

Users must log into Hearthstone by the Blizzard Battle.net launcher. The launcher requires a sign in with name and password, or by Facebook Log In. Players also have the option to add an authenticator or a phone number as a secondary layer of security.

### **3.6.4 Privacy**

Blizzard Entertainment, which owns the Hearthstone app, is an ESRB Certified member in good standing for their responsible privacy practices. The ESRB privacy certification shows that Blizzard is in compliance with applicable privacy laws and best practices. Blizzard has obtained the ESRB's most rigorous certification, complying with mobile privacy standards and best practices. Blizzard has undergone independent testing to receive this certification.

### **3.6.5 Maintainability**

Jenkins is used to build and test Hearthstone updates and deploy to production.

Docker and Kubernetes are used to manage demand on servers. Docker provides everything Hearthstone needs to run and allows the app to be more agile. Kubernetes is an open-source system for automating deployment, scaling and management of applications. It ensures Hearthstone is deployed the same way, everywhere.

## **3.7 Additional Specific Requirements**

This section details out additional specific requirements critical to the software design.

### **3.7.1 System Mode**

There is no administrative or system mode available to players. There are additional options and menus available to Blizzard Game Masters and Blizzard customer service employees.

### **3.7.2 User Class**

There are no separate user classes. All players have access to the same set of interfaces and actions.

### **3.7.3 Objects**

Objects are used like building blocks in Object Oriented Programming to group like types of data together. These are the objects that Hearthstone has.

#### **card:**

name- *name of card*

text- *The in-game description of the card*

flavorText- *Extra text that is shown when hovering over a card in game*

image- *an image of the card with localized text*

artist- *name of card artist*

attack- *a number for attack power*

cardClass- *neutral, or mage/paladin/etc*

collectible- *bool true or false*

cost- *cost of mana to play*

elite- *bool true/false*

faction- *horde or alliance*

health- *a number for health points*

mechanics- *shout, battlecry, deathrattle, charge, taunt, etc*

rarity- *a type such as rare or legendary*

set- *the card set the card came from*

type- *minion, spells, weapons or hero*

**cardBack:**

description- *text description of card*

name- *name of card back*

prefab\_name- *name of asset*

note\_desc- *where the card came from*

source- *where the card came from*

id- *number id of card for database*

enabled- *true/false*

## **4. References Used**

Since this SRS was created from an already created game, research was done into how Hearthstone was created. This is a list of websites used for reference in this SRS.

Hearthstone Game Accessibility

<https://www.game-accessibility.com/game/hearthstone/>

GDC: Hearthstone 10 Bits of Design

<https://www.gdcvault.com/play/1020775/Hearthstone-10-Bits-of-Design>

Play Hearthstone Game Guide

<https://playhearthstone.com/en-us/game-guide/>

Disability Game Review Hearthstone

<https://dagersystem.com/disability-game-review-hearthstone/>

ESRB Privacy Ratings

<https://www.esrb.org/privacy/>

Blizzard Game Data APIs Hearthstone Guide

<https://develop.battle.net/documentation/guides/game-data-apis-hearthstone-guide>

Hearthsim- open source hearthstone simulator

<https://hearthsim.info/>

Blizzard Careers

<https://careers.blizzard.com/en-gb/openings>

Icy Veins Mechanics Guide

<https://www.icy-veins.com/hearthstone/mechanics-guide>

Hearthstone Wiki

[https://hearthstone.gamepedia.com/Hearthstone\\_Wiki](https://hearthstone.gamepedia.com/Hearthstone_Wiki)