**Game Design**

**NASA EVA Gamification**

*Group 3*

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| --- | --- | --- | --- |
| **Version Number** | **Description of Change** | **Author** | **Date** |
| 1.0 | Initial Creation of Document | Kevin Fortier, Victoria Guadagno | 03/11/2018 |
| 1.1 | Revised for Milestone 2 feedback | Victoria Guadagno | 03/25/2018 |
| 1.2 | Added Montrell to title page | Michael Salgo | 03/27/2018 |
| 1.3 | Various updates to align with project | Kevin Fortier | 03/28/2018 |

# Introduction

## Document Overview

This document defines the NASA EVA Gamification extension’s game design approach. The extension will adhere to open source licensing rules, specifically the MIT License. All backend code for the extension will use commercial off-the-shelf (COTS) software. Specifically, PHP v5.6, MariaDB v5.5 DBMS, and MediaWiki v1.27 as a baseline. Code for the extension will be maintained on GitHub and be publicly accessible after the completion of the Spring 2018 semester ("The MIT License").

Each game will award badges. One and done games (for example, email verification) will award a single badge. Tiered games (for example, post 10 times, post 100 times, post 1000 times) will award a badge for each rank.

# Software Architecture Overview

The NASA EVA Gamification extension has four (4) main conceptual pieces:

* The gamification database table – to store earned user badges
* The configuration array of the extension – used to register badges that can be earned and the threshold needed to obtain them, where applicable
* The MediaWiki hook functionality – to perform additional activities when certain MediaWiki actions are taken
* The user profile – used to display the earned badges to the users of the wiki

## Database Table

See the Database Design documentation for details.

## Configuration Array

The extension will define a PHP array to store the configuration of the games the extension knows about and what badge rank the game will bestow. The extension will also define a maximum rank value, to be used within the user profile.

For each game in the extension, the configuration array will have:

* A badge tag that can be earned through the game
* The rank value associated with that game, allowing an admin to customize the importance of each game

The badge rank names will be stored in an i18n-localization array, where higher ordinal indexes will relate to harder, more challenging, ranks. Default values for the NASA EVA Gamification extension will set to:

* 1 – Astronaut
* 2 – Spacewalker
* 3 – Moonwalker

## MediaWiki Hooks

The hook interface allows for the extension to perform extra steps during MediaWiki actions. For this extension, each game may need to hook into the related MediaWiki action and determine if a user has earned a badge by performing that action. If it is determined that the action warrants a badge, the extension code will insert a row into the gamification\_badges database table. The MySQL INSERT statement will use the IGNORE option, to avoid the need of an additional SELECT statement to determine if the row already exists in the database table.

## User Profile

See the User Profile Design document for details.

# Software Design Description

## Game: Verify Email Address

Of the many beneficial activities a user can perform on a wiki, verifying their email address is something that helps the administrator and user community by keeping the verified user informed of updates to the content of pages that they are watching. To incentivize the user, a badge will be bestowed on the user once they have verified their email address within the wiki.

### How to Obtain this Badge

This badge will be awarded when the user successfully verifies his/her email address.

### Verify Email Address Design Description

Verifying an email address, while important, is a very easy and quick process. As such, the awarded badge will be at the Astronaut (or lowest) rank.

### Workflows

The extension will add a hook on the ConfirmEmailComplete MediaWiki event. This event is only called when a user successfully validates an email address.

### Algorithm Pseudocode

function onConfirmEmailComplete() {  
 insert ignore into database table: user\_id, emailverification badge\_tag, badge rank, current timestamp  
}

### extension.json file

MediaWiki is hardcoded to look for an extension.json file within an extension’s directory. This file is used to register the extension’s attributes with the MediaWiki code and define where it can find required information within the extension’s directory structure. ("Manual:Extension.json/Schema")

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute Name** | **Required** | **Current Value** | **Description** |
| manifest\_version | Yes | 1 | Used to set the version and format being used in the extension.json file. |
| name | Yes | NASA\_EVA\_Gamification | The internal name of the extension which other extensions will use to determine what is loaded. |
| type | No | other | Determines what type of extension it is, and effects where it is displayed on the Special:Version page |
| author | No | UMUC SWEN670 Spring2018 | Can be a single string or an array of strings. Can also contain wikitext. |
| version | No | 1.0.0 | Typical version control. |
| url | No | URL to the GitHub page | Used to link back to the extension’s documentation or homepage outside of MediaWiki. |
| descriptionmsg | No | gamification-desc | Localization tag used to display the extension’s description. Tag value is pulled by the user’s <language>.json file in the i18n directory. |
| license-name | No | MIT | Open source license text attached to the extension. Details can be found here: <https://spdx.org/licenses/> |
| ResourceFileModulePaths | No | localBasePath: “” remoteExtPath: “NASA\_EVA\_Gamification” | Allows for the extension to define specific directory paths to where Resource Modules are defined. |
| ResourceModules | No | "ext.gamification.foo": {  "scripts": [  "modules/ext.gamification.js",  "modules/ext.gamification.foo.js"  ],  "styles": [  "modules/ext.gamification.foo.css"  ],  "messages": [],  "dependencies": []  } | Tells the MediaWiki ResourceLoader what modules to register from this extension. More details can be found here: <https://www.mediawiki.org/wiki/Manual:$wgResourceModules> |
| ExtensionMessagesFiles | No | NASA\_EVA\_GamificationAlias: “NASA\_EVA\_Gamification.i18n.alias.php” | Location of the PHP internationalization language files. More details can be found here: <https://www.mediawiki.org/wiki/Special:MyLanguage/Manual:$wgExtensionMessagesFiles> |
| MessagesDirs | No | NASA\_EVA\_Gamification: “i18n” | Directory path to find the internationalization json files. |
| SpecialPages | No | UserGamificationProfile: “SpecialUserGamificationProfile” | Mapping of page name to class name for SepcialPages. More details can be found here: <https://www.mediawiki.org/wiki/Special:MyLanguage/Manual:$wgSpecialPages> |
| AutoLoadClasses | No | NASA\_EVA\_GamificationHooks: “NASA\_EVA\_Gamification.hooks.php” SpecialUserGamificationProfile: “specials/SpecialUserGamificationProfile.php” | Mapping array to PHP classes that will be autoloaded. More details can be found here: <https://www.mediawiki.org/wiki/Special:MyLanguage/Manual:$wgAutoloadClasses> |
| Hooks | No | ConfirmEmailComplete: NASA\_EVA\_GamificationHooks::onConfirmEmailComplete LoadExtensionSchemaUpdates: “NASA\_EVA\_GamificationHooks::onLoadExtensionSchemaUpdates” | Hooks this extension uses. |
| config | No | NASA\_EVA\_GamificationGamesToRankMapping: {“gamification-badge-emailverification” => “gamification-rank-1”} NASA\_EVA\_GamificationMaxNumberOfRanks: 3 | Configuration section where system administrators can change configurable values used by the extension. Format of this attribute is dependent on the manifest\_version value. |

### NASA\_EVA\_Gamification.hooks.php

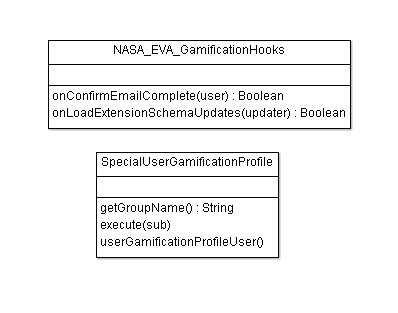
As more games are added to the extension, more hooks will be defined here. Below is a list of current hooks and what they do:

|  |  |  |
| --- | --- | --- |
| **Hook Name** | **MediaWiki function hooked into** | **What it does** |
| onConfirmEmailComplete | ConfirmEmailComplete | Bestows trophy to user for validating email. |
| onLoadExtensionSchemaUpdates | LoadExtensionSchemaUpdates | Runs the mySQL script to add/alter the database tables when the extension is loaded into the wiki |

### NASA\_EVA\_Gamification.php

Currently used for MediaWiki extension loading only.

### Extension Class Diagram



# Requirements Mapping

The design satisfies the following requirements:

## Business Requirements

|  |  |  |  |
| --- | --- | --- | --- |
| **ID** | **Semester** | **Requirement** | **Source of Requirement** |
| B1 | Spring 2018 | Allow for the wiki system administrator(s) to configure variables via a configurable PHP File | <https://github.com/darenwelsh/Profiler> |

## Functional Requirements

|  |  |  |  |
| --- | --- | --- | --- |
| **ID** | **Semester** | **Requirement** | **Source of Requirement** |
| F7 | Spring 2018 | Be able to instantly update score as activities are done | Daren Welsh |
| F8 | Spring 2018 | Include Badges | Daren Welsh |
| F9 | Spring 2018 | Include One-And-Done Games | Daren Welsh |
| F10 | Spring 2018 | User Profile will display all badges earned | Daren Welsh |
| F11 | Spring 2018 | User Profile will display user name | Daren Welsh |
| F12 | Spring 2018 | User Profile will display user real name | Daren Welsh |
| F13 | Spring 2018 | User will get a badge for verifying his/her email address | Spring 2018 Team |
| F14 | Spring 2018 | Make games scalable | Daren Welsh |

## 

## Non-Functional Requirements

|  |  |  |  |
| --- | --- | --- | --- |
| **ID** | **Semester** | **Requirement** | **Source of Requirement** |
| B3 | Future | All work should be contained in a single extension | <https://learn.umuc.edu/d2l/le/content/287871/viewContent/11764296/View> |
| F1 | Spring 2018 | All code should be open source | <https://learn.umuc.edu/d2l/le/content/287871/viewContent/11764296/View> |
| F2 | Spring 2018 | All back-end code should be PHP | <https://github.com/darenwelsh/Profiler> |
| F3 | Spring 2018 | Database should be MariaDB/MySQL | <https://github.com/darenwelsh/Profiler> |
| F5 | Spring 2018 | All events and hooks used should be clearly documented | <https://github.com/darenwelsh/Profiler> |
| F6 | Spring 2018 | All code is stored in GitHub | Daren Welsh |

# COTS Identification

DBMS – MariaDB v5.5

Software – PHP v5.6

MediaWiki – v1.27

# References

Manual:$wgAutoloadClasses. (n.d.). Retrieved March 4, 2018, from <https://www.mediawiki.org/wiki/Manual:$wgAutoloadClasses>

Manual:$wgExtensionMessagesFiles. (n.d.). Retrieved March 4, 2018, from https://www.mediawiki.org/wiki/Manual:$wgExtensionMessagesFiles

Manual:$wgResourceModules. (n.d.). Retrieved March 4, 2018, from <https://www.mediawiki.org/wiki/Manual:$wgResourceModules>

Manual:$wgSpecialPages. (n.d.). Retrieved March 4, 2018, from <https://www.mediawiki.org/wiki/Manual:$wgSpecialPages>

Manual:Extension.json/Schema. (n.d.). Retrieved March 04, 2018, from https://www.mediawiki.org/wiki/Manual:Extension.json/Schema

Software Package Data Exchange (SPDX). (n.d.). Retrieved March 4, 2018, from <https://spdx.org/licenses/>

The MIT License. (n.d.). Retrieved March 4, 2018, from <https://opensource.org/licenses/MIT>