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| **FR-01** |  | **The system must have one admin account by default.** | **MUST** |
|  | R-01.1 | An admin cannot make use of the requirements set for the user. (Ex: creating a *Hero*, playing the game) | Must |
|  | Q-02.1 | To log in the user should provide an existing combination of username and password. |  |
| **FR-02** |  | **An admin can create other admin accounts.** | **MUST** |
|  | Q-02.1 | The admin must provide an email and full name. | Must |
|  | Q-02.2 | The system must generate the password. | Should |
| **FR-03** |  | **An admin can manage content for the game (Items/Dungeons/Quests)** | **MUST** |
|  | Q-03.1 | Admin can create content. | Must |
|  | Q-03.2 | Admin can read all content. | Must |
|  | Q-03.3 | Admin can update content. | Must |
|  | Q-03.4 | Admin can delete content. | Must |
|  | Q-03.5 | Admin must provide full information over the content before it can be added or edited. | Must |
| **FR-04** |  | **A user must be able to create an account.** | **Must** |
|  | Q-04.1 | An account must be created using an email, username and password. | Must |
|  | R-04.2 | A username must exist of at least 6 characters. | Should |
|  | R-04.3 | A password must exist of at least 6 characters of which minimal one capital letter, one small letter and one number. | Should |
| **FR-05** |  | **A user must be able to log in.** | **MUST** |
|  | Q-05.1 | To log in the user should provide an existing combination of username and password. | Must |
| **FR-06** |  | **An account must be able to create a *Hero*.** | **Must** |
|  | R-06.1 | Each account can have a maximum of 3 *Heroes*. | Must |
|  | Q-06.2 | Statistics of the created *Hero* can be edited while creating. | Must |
| **FR-07** |  | **A *Hero* must be able to buy items.** | **Must** |
|  | Q-07.1 | The *Hero* must have enough gold in the bank to buy the item. | Must |
|  | R-07.2 | The *Hero* must have at least one empty space in the backpack. | Must |
| **FR-08** |  | **A *Hero* must be able to sell an item.** | **Must** |
|  | R-08.1 | A *Hero* can only sell items that are in the backpack. | Must |
| **FR-09** |  | **A *Hero* must be able to enter a dungeon from a list.** | **Must** |
|  | Q-09.1 | The list must consist of all available dungeons at that moment. | Should |
|  | Q-09.2 | The list must be first sorted on level (difficulty) and then on alphabet. | Should |
| **FR-10** |  | **A *Hero* must be able to combat other creatures in a dungeon.** | **Must** |
|  | Q-10.1 | The *Hero* can earn gold and experience from battling these creatures. | Should |
|  | Q-10.2 | The *Hero* will earn a bonus of gold and experience when the dungeon is completed. | Must |
| **FR-11** |  | **A *Hero*****should be able to accept quests.** | **Should** |
|  | R-11.1 | A *Hero* can only have one active quest at the same time. | Should |
| **FR-12** |  | **A *Hero*****should be able to complete quests.** | **Should** |
|  | Q-12.1 | When a quest is completed the *Hero* is giving gold, experience and/or items as reward. | Should |
| **FR-13** |  | **A *Hero* should be able to cancel an active quest.** | **Should** |
|  | R-13.1 | This is only possible when the quest is not yet completed. | Should |
| **FR-14** |  | **Every user can watch the leaderboards.** | **Should** |
|  | R-14.1 | Only non-blocked users will be appearing on the leaderboards. | Must |
| **FR-15** |  | **An admin can block an existing active account.** | **Must** |
|  | R-15.1 | An admin cannot block another admin. | Must |
|  | Q-15.2 | An admin must provide a length of the block. (Ex: one week or permanent) | Should |
|  | Q-15.3 | An admin must provide a message for the user. | Should |
| **FR-16** |  | **An admin can unblock an existing blocked account.** | **Must** |

FR = Functional Requirement

Q = Quality Requirement

R = Restrictive Requirement

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| UC01 | Starting with an admin |
| Description | Before starting the application for the first time a admin should already exist. |
| Actors | Developer |
| Preconditions | Application has not launched before. |
| Flow | 1. Actor logs in using the standard admin account. 2. System will check credentials and grants access to the admin interface. [1]   Q-01.1, Q-01.2 |
| Exception(s) | 1. Incorrect credentials were entered. Show message and return to step 2. |
| Result | Actor will log into the standard admin account. FR-01 |

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| UC02 | Creating admin account |
| Description | An logged in admin created another admin account for someone else to use. |
| Actors | Developer |
| Preconditions | One admin account already exists. FR-01 |
| Flow | 1. Actor logs into admin account. 2. System shows admin interface. 3. Actor navigates to the registering admin view and fills all necessary data. Q-02.1 4. The system creates a new admin account. [1] Q-2.2 |
| Exception(s) | 1. Not all necessary data was entered. Show message and back to step 5. |
| Result | The system has created a new admin account with a generated password. FR-02 |

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| UC03 | Creating new content |
| Description | An actor on a admin account creates a new item for the game |
| Actors | Admin |
| Preconditions | One admin account already exists. FR-01 |
| Flow | 1. Actor logs into admin account. 2. System shows admin interface. 3. Actor navigates to the create content view, selects what kind of content it wants to add to the game and fills in all necessary data. Q-03.5 4. The system will create the new content. [1] Q-03.1 |
| Exception(s) | 1. Not all necessary data was entered. Show message and return to step 6. |
| Result | The system has created the new content and added to the game. FR-03 |

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| UC04 | Editing content |
| Description | An actor on an admin account edits existing content. |
| Actors | Admin |
| Preconditions | One admin account already exists. FR-01 |
| Flow | 1. Actor logs into admin account. 2. System shows admin interface. 3. Actor navigates to the editing view, selects what content it wants to edit and fills in all necessary data. Q-03.2, Q-03.5 4. The system will edit the existing content. [1] Q-03.3 |
| Exception(s) | 1. Not all necessary data was entered. Show message and return to step 6. |
| Result | The system has edited the content. FR-03 |

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| UC05 | Deleting content |
| Description | An actor on a admin account deletes existing content. |
| Actors | Admin |
| Preconditions | One admin account already exists. FR-01 |
| Flow | 1. Actor logs into admin account. 2. System shows admin interface. 3. Actor navigates to the deleting view, selects what content it wants to be deleted. Q-03.2 4. The system will delete the selected content. Q-03.4 |
| Exception(s) |  |
| Result | The system has deleted the content. FR-03 |

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| UC06 | Registering |
| Description | A user creates an account to play with. |
| Actors | User |
| Preconditions |  |
| Flow | 1. Actor navigates to the register view and fills in all necessary data. Q-04.1 2. The system creates an account for the actor. [1] [2] [3] [4] |
| Exception(s) | 1. Not all necessary data was entered. Show message and return to step 3. Q-04.1 2. The entered email is incorrect. Show message and return to step 3. Q-04.1 3. The entered username is too short. Show message and return to step 3. R-04.2 4. The entered password does not fulfill all expectations. Show message and return to step 3. R-04.3 |
| Result | The system has created an account for the actor. FR-04 |

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| UC07 | Logging in |
| Description | The actor logs in using its account credentials. |
| Actors | User |
| Preconditions | The actor already has an existing account. |
| Flow | 1. Actor navigates to the login view and fills in username and password. 2. The system logs the user in and returns start view. [1] [2] |
| Exception(s) | 1. The username does not exist in the system. Show message and return to step 3. Q-05.1 2. The password does not match the username. Show message and return to step 3. Q-05.1 |
| Result | The actor is logged into its account. FR-05 |

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| UC08 | Creating a hero |
| Description | Creating a hero to play with |
| Actors | User |
| Preconditions | The actor is already logged in. |
| Flow | 1. System shows create hero view. 2. Actor clicks add hero and changes attributes of the hero. [1] Q-06.2 3. System creates a hero for the actor. |
| Exception(s) | 1. Actor already has 3 existing heroes. R-06.1 |
| Result | A hero is creating on the account of the actor. FR-06 |

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| UC09 | Buying items |
| Description | The hero of the actor buys an item from the shop. |
| Actors | User |
| Preconditions | The actor is already logged in. |
| Flow | 1. The system shows the shop view. 2. The actor selects the items it wants to buy. 3. The system retracts the money from the actor’s hero’s account and gives the hero the item. [1] [2] |
| Exception(s) | 1. The hero has not enough money to buy the item. Show message and return to step 2. Q-07.1 2. The hero has not enough empty space in its backpack to save the item. Show message and return to step 2. R-07.2 |
| Result | The hero has its money withdrawn and receives the item in its backpack. |

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| UC10 | Selling items |
| Description | The hero of the actor sells an item to the shop. |
| Actors | User |
| Preconditions | The actor is already logged in. |
| Flow | 1. The system shows the shop view. 2. The actor selects the item from its backpack that it wants to sell. [1] 3. The system retrieves the item from the actor’s backpack and deposits the correct amount of gold on the hero’s balance. |
| Exception(s) | 1. The hero has no items in its backpack, and thus cannot select any items. |
| Result | The hero loses the item from the backpack and receives gold for it. |

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| UC11 | Entering a dungeon |
| Description | The hero enters a dungeon from a list. |
| Actors | User |
| Preconditions | The actor is already logged in. |
| Flow | 1. Actor navigates to the dungeon view and finds a list with all available dungeons, sorted on alphabet. Q-09.1, Q-09.2 2. The system will transfer the hero to the selected dungeon. |
| Exception(s) |  |
| Result | The hero is transferred to the selected dungeon. FR-09 |

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| UC12 | Combat in dungeon |
| Description | The hero combats creeps in a joined dungeon. |
| Actors | User |
| Preconditions | The actor is already logged in. |
| Flow | 1. Actor navigates to the dungeon view. 2. The system will stage a battle. [1] 3. Hero receives gold and experience. Q-10.1 |
| Exception(s) | 1. The hero dies while in the dungeon. Go back to main view and lose some gold. |
| Result | The hero gained gold and experience from defeating enemy creeps. FR-10 |

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| UC13 | Completing a dungeon |
| Description | The hero combats creeps in a joined dungeon. |
| Actors | User |
| Preconditions | The actor is already logged in. |
| Flow | 1. Actor navigates to the dungeon view. 2. The system will stage multiple battles. [1] 3. Hero completed the dungeon. 4. Hero receives bonus experience and gold. Q-10.2 |
| Exception(s) | 1. The hero dies while in the dungeon. Go back to main view and lose some gold. |
| Result | The hero gained gold and experience from defeating the dungeon. FR-10 |

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| UC14 | Accepting a quest |
| Description | The hero accepts a quest. |
| Actors | User |
| Preconditions | The actor is already logged in. |
| Flow | 1. Actor navigates to the quest view and selects a quest from a list. 2. The system assigns the quest to the hero. [1] |
| Exception(s) | 1. The actor already has a quest assigned. Ask the actor if it wants to cancel current quest. Then return to step 2. R-11.1 |
| Result | The hero now has a quest active. FR-11 |

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| UC15 | Completing a quest |
| Description | The hero completes a quest. |
| Actors | User |
| Preconditions | The actor is already logged in and as a quest active. |
| Flow | 1. Actor navigates to the quest view and selects complete quest button. [1] 2. The system will grant the hero gold and/or items and removes the quest from the hero. Q-12.1 |
| Exception(s) | 1. The hero has not completed the quest yet. Show message and return to step 1. |
| Result | The hero received experience and gold for completing a quest. FR-12 |

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| UC16 | Canceling a quest |
| Description | The hero cancels a quest. |
| Actors | User |
| Preconditions | The actor is already logged in and as a quest active. |
| Flow | 1. Actor navigates to the quest view and selects cancel quest. [1] 2. The system removes the quest from the hero. |
| Exception(s) | 1. The quest is completed. Show message and go to step 1 of UC16. R-13.1 |
| Result | The quest is removed from the user. FR-13 |

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| UC17 | Leaderboards |
| Description | Every actor can watch the leaderboards. |
| Actors | Admin, user |
| Preconditions | The actor is already logged in. |
| Flow | 1. System shows leaderboards view. 2. Actor can search for active players or can watch top players in the leaderboards. R-14.1 |
| Exception(s) |  |
| Result | Actor can view all active players on the leaderboards. FR-14 |

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| UC18 | Blocking an account |
| Description | An actor can block an existing account and thus preventing the account from logging in. |
| Actors | Admin |
| Preconditions | The actor is already logged in. |
| Flow | 1. System shows the manage users view. 2. Actor selects the account from a list of all non-admin accounts and clicks the block button. [1] R-15.1 3. System shows a new view where a message and duration must be stated. 4. Actor must set a message and duration. Q-15.2, Q-15.3 5. The system will block the account from logging in. |
| Exception(s) | 1. The user is already blocked. Button should not be clickable. Return to step 2. |
| Result | The selected account is blocked and cannot login. FR-15 |

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| UC19 | Logging in with blocked account |
| Description | The actor tries to log in with an account that is blocked by an admin. |
| Actors | User |
| Preconditions | The account is blocked. |
| Flow | 1. Actor navigates to the login view and fills in the correct credentials. 2. The system will show a message which states the reason of the block and the duration of the block. Q-15.2, Q-15.3 |
| Exception(s) |  |
| Result | The actor cannot login and will receive a message. |

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| UC20 | Unblocking an account |
| Description | An actor can unblock an existing blocked account. |
| Actors | Admin |
| Preconditions | The actor is already logged in. |
| Flow | 1. Actor navigates to the manage users view and selects the account from a list of all non-admin accounts. [1] R-15.1 2. The system will unblock the account. |
| Exception(s) | 1. The user is not blocked. Button should not be clickable. Return to step 2. |
| Result | The selected account is unblocked and can login again. FR-16 |

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| Test case | Use case | Input | Expected output |
| TC01 | UC01 | Username: a.SuperUser  Password: SU@123 | Actor is logged into the already existing admin account. |
| TC02 | UC02 | FirstName = Ruud  LastName = Deenen  DateOfBirth = 03-07-1998 | Admin is created by system. |
| TC03 | UC02 | FirstName = Ruud  LastName = *null*  DateOfBirth = 03-07-1998 | Admin is not created, incorrect LastName. |
| TC04 | UC02 | FirstName = *null*  LastName = Deenen  DateOfBirth = 03-07-1998 | Admin is not created, incorrect FirstName. |
| TC05 | UC02 | FirstName = Ruud  LastName = Deenen  DateOfBirth = *null* | Admin is not created, incorrect DateOfBirth. |
| TC06 | UC06 | Email = player@mail.com  FirstName = *null*  LastName = *null*  Username = player123  Password = Test@123  ConfirmPassword = Test@123 | User is created. All required fields are filled. |
| TC07 | UC06 | Email = player@mail.com  FirstName = *null*  LastName = *null*  Username = *null*  Password = Test@123  ConfirmPassword = Test@123 | User is not created. Username is missing. |
| TC08 | UC06 | Email = player@mail.com  FirstName = Super  LastName = Player  Username = player123  Password = Test@123  ConfirmPassword = Test@123 | User is created. All required fields are filled. |
| TC09 | UC06 | Email = player@mail.com  FirstName = Super  LastName = Player  Username = player123  Password = Test@1234  ConfirmPassword = Test@123 | User is not created. Passwords do not match. |
| TC10 | UC06 | Email = player@mail  FirstName = Super  LastName = Player  Username = player123  Password = Test@1234  ConfirmPassword = Test@123 | User is not created. Email is incorrect. |
| TC11 | UC06 | Email = player@mail.com  FirstName = Super  LastName = Player  Username = ABC  Password = Test@1234  ConfirmPassword = Test@123 | User is not created. Username is too short. |
| TC12 | UC06 | Email = player@mail.com  FirstName = Super  LastName = Player  Username = player123  Password = TestOne  ConfirmPassword = TestOne | User is not created. Password is too easy (requires at least one extra number). |
| TC13 | UC06 | Email = player@mail.com  FirstName = Super  LastName = Player  Username = player123  Password = test123  ConfirmPassword = test123 | User is not created. Password is too easy (requires at least one extra capital letter). |
| TC14 | UC06 | Email = player@mail.com  FirstName = Super  LastName = Player  Username = player123  Password = TEST123  ConfirmPassword = TEST123 | User is not created. Password is too easy (requires at least one small letter). |
| TC15 | UC06 | Email = player@mail.com  FirstName = Super  LastName = Player  Username = player123  Password = TEST123  ConfirmPassword = TEST123 | User is not creating. Password is too short. |
| TC16 | UC07 | Username: Player123  Password: Test@123 | User is logged in. |
| TC17 | UC07 | Username: Player123  Password: Test | User is not logged in. Passwords do not match. |
| TC18 | UC07 | Username: Player  Password: Test@123 | User is not logged in. Username does not exist. |
| TC19 | UC18 | Message: hacker  Permanent: yes | User gets blocked. |
| TC20 | UC18 | Message: hacker  Permanent: no  Until: 2020 | User gets blocked until 2020. |
| TC21 | UC03 | Uploads file in correct format | Item is added |
| TC22 | UC03 | Uploads file in incorrect format | Item is not added. Show error to actor. |
| TC23 | UC03 | Name: Sword | Item is added with all empty fields converted to 0. |
| TC24 | UC03 | Name: | Item is not added. Name cannot be empty. |
| TC25 | UC04 | Attributes are changed. | Item is updated. |
| TC26 | UC04 | Attributes are not changed. | Item is not updated. Show error. |
| TC27 | UC05 | Selected item | Item is deleted. |
| TC28 | UC08 | Actor has <= 3 heroes.  Name: Invoker | Hero is added |
| TC29 | UC08 | Actor has <= 3 heroes.  Name: “”. | Hero is not added. Name cannot be empty. |
| TC30 | UC08 | Actor has > 3 heroes. | Hero is not added. Actor cannot have more than 3 heroes. |
| TC31 | UC09 | Gold: 5000  Price: 5000 | Item can be bought. |
| TC32 | UC09 | Gold: 4999  Price: 5000 | Item cannot be bought. Actor has not enough gold. |
| TC33 | UC09 | Empty inventory slots > 0 | Item can be bought. |
| TC34 | UC09 | Empty inventory slots = 0 | Item cannot be bought. Actor has no empty space. |
| TC35 | UC10 | Actor has no items. | No item can be sold. |
| TC36 | UC10 | Selected item. | Selected item is sold. Actor gains gold. |
| TC37 | UC19 | User is blocked. | User is not logged in. Gets error with the message set for the block. |
| TC38 | UC20 | Actor clicks button to unblock user. | User gets unblocked. |
| TC39 | UC20 | User is not blocked | Actor gets message that the user trying to unblock is already unblocked. |
| TC40 | UC11 | Actor selects a dungeon. | Actor will enter the dungeon. |
| TC41 | UC12 | HeroHP = 1  EnemyHP = 0 | Enemy dies, hero wins the battle. |
| TC42 | UC12 | HeroHP = 0  EnemyHP = 1 | Hero dies, loses gold and is placed out of the dungeon. |
| TC43 | UC13 | All battles of the dungeon have been completed and the hero has not died. | Hero completes dungeon. Gets gold/items and experience and is placed out of the dungeon. |
| TC44 | UC14 | Hero has no active quest. | Quest is assigned to the hero. |
| TC45 | UC14 | Hero has an active quest. | Quest is not assigned to the hero. |
| TC46 | UC15 | Hero has completed all requirements for the quest. | Quest is completed. Gains gold/items |
| TC47 | UC15 | Hero has not completed all requirements for the quest. | Quest is not completed. |
| TC48 | UC16 | Hero has an active quest. | Quest is removed from the hero. |
| TC49 | UC16 | Hero has completed all requirements for the quest. | Quest is not removed but instream completed. Gains gold/items. |
| TC50 | UC17 |  | Actor can see the leaderboards. |