Functional Requirements

# 1  Version History

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Version #** | **Implemented**  **By** | **Revision**  **Date** | **Approved**  **By** | **Approval**  **Date** | **Reason** |
| 1.0 | Andrii Dobroshynskyi | March 20th | Cole Smith | March 21st | Initial Draft |
| 1.1 | Cole Smith | March 21th | Andrii D. | March 21st | Refinements |
|  |  |  |  |  |  |

# 1  Key Terms

The following table provides definitions for terms relevant to this document.

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| --- | --- |
| **Term** | **Definition** |
| Discord | Messaging service providing socket-based messaging and authentication layers |
| code snippet | A small-sized stand-alone piece of software code that has some output |
| LaTeX | Typesetting language / format for easier rendering of mathematic equations / quantitative concepts |
| P2P | Peer-to-peer connectivity such that communication can be real-time and users can join or leave the service when desired |

# 2  Introduction

## 2.1  Purpose Of The Functional Requirements Definition

This document provides an outline for functional requirements. This documents and tracks the necessary information required to effectively define functional requirements. The requirements document is created during the Planning Phase of the project. Its intended audience is the project manager, project team, project sponsor, client/user, and any stakeholder whose input/approval into the requirements definitions process is needed.

Labels:  Definition

## 2.2  Overall Description

The ResearchRealms application is a proposed system that will utilize a socket-based P2P connection to extend functionality of a messaging platform to enhance communication and collaboration between quantitative-focused users. The system will integrate with the Discord messaging and communication platform and build on top of the authentication and messaging layers to provide functionality of executing small-sized snippets of code between connected users, which is beneficial for reproducibility when performing academic research. Additionally, the system will support saving and retrieving the aforementioned code snippets via a specified database connection that can be configured per-user node, and will also support rendering of LaTeX typesetting language for easier viewing of mathematic equations and expressions which is also beneficial when performing quantitative research. The system will also utilize the authentication and messaging layers for these use cases such that outputs of commands can be shared P2P between the nodes in real-time for maximum collaboration.

Labels:  Definition, Analysis

# 3  Functional Requirements

## 3.1  Usability Requirements

### 3.1.1  Executing Code Snippets

System should be able to execute arbitrary code snippets via a P2P connection

Labels:  Functional Requirement

### 3.1.2  Executing Code Snippets with Input

System should be able to execute code snippets along with some input files passed in as parameters via a P2P connection. The number of additional media attachments is a maximum of one.

Labels:  Functional Requirement

### 3.1.3  Rendering Charts

System should be able to render graphical charts as output of arbitrary code snippet execution

Labels:  Functional Requirement

### 3.1.4  Rendering LaTeX

System should be able to render graphical representations of LaTeX typesetting language

Labels:  Functional Requirement

### 3.1.5  Saving to Database

System should support persisting code snippets via a save to a connected database instance

Labels:  Functional Requirement

### 3.1.6  Retrieving from Database

System should support retrieving persisted code snippets from the database via a connected database instance

Labels:  Functional Requirement

### 3.1.7  Connecting to Discord messaging layer

System should connect to the messaging layer to build commands on top of

Labels:  Functional Requirement

### 3.1.8  Connecting to Discord authentication layer

System should connect to the authentication layer to differentiate peers connected to the network

Labels:  Functional Requirement

### 3.1.9  Connecting to Discord context layer

System should connect to the context layer via an API token to gain access to the information about current connection context (users, usernames, data)

Labels:  Functional Requirement

## 3.2  Supportability Requirements

### 3.2.1  Connections via hosted node

System should support peer connections via an individual node to other nodes for communication

Labels:  Functional Requirement

### 3.2.2  Configurability for self-hosting

System should support configurability to be deployed P2P or centralized with custom database connections and settings based on user needs

Labels:  Functional Requirement

### 3.2.3  Extensibility for self-hosting

System should support extensibility with custom usability requirements if deployed by user in centralized or P2P way

Labels:  Functional Requirement

### 3.2.4  Supportability of messaging layer

System should support incoming messages and commands via a socket connection to server / peers

Labels:  Functional Requirement

## 3.3  Security Requirements

### 3.3.1  User differentiation

System should differentiate users based on the connection to the authentication layer of the messaging application

Labels:  Functional Requirement

### 3.3.2  Database query access specification

System should restrict queries from users based on their authenticated profile via the authentication layer as well as the current connection context

Labels:  Functional Requirement

## 3.4  Interface Requirements

### 3.4.1  Text input

System should accept text input by extending the functionality of the messaging layer

Labels:  Functional Requirement

### 3.4.2  Text output

System should support sending back text output via the messaging layer. The output is to be a maximum of 2000 characters.

Labels:  Functional Requirement

### 3.4.3  Image output

System should support sending back rendered images via the messaging layer. The number of images is to be a maximum of one.

Labels:  Functional Requirement

## 3.5  Assumptions / Constraints

Labels:  Constraint

### 3.5.1  Connectivity to Discord

System assumes available connection to Discord context, messaging, and authentication layers via a Token to facilitate P2P communication

Labels:  Functional Requirement

### 3.5.2  Connectivity to Database

System assumes available connection to a database instance to facilitate data persistence and retrieval for each connected node

Labels:  Functional Requirement

# 5  Functional Requirements Definition Approval

The undersigned acknowledge they have reviewed the Functional Requirements Definition and agree with the approach it presents. Any changes to this Requirements Definition will be coordinated with and approved by the undersigned or their designated representatives.

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| Signature: | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Date: | March 20th, 2020 |
| Print Name: | Andrii Dobroshynskyi |  |  |
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| Signature: | *Cole Smith* | Date: | March 20th, 2020 |
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# 6  References

The following table summarizes the documents referenced in this document.

|  |  |  |
| --- | --- | --- |
| **Document Name and Version** | **Description** | **Location** |
|  |  |  |

Rationale: N/A

Quality Score: N/A

Labels: *None to display.*