Peer Revue Requirements Specification

Version 1.0

February 8, 2023

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1. Introduction

1.1 Project Overview

Peer Revue is an application in development that is built to address the delay in writing scientific papers. Scientists and researchers are required to write papers explaining, describing, and detailing their research so that it may be recorded and peer reviewed. In this way the research and its data are both verified by and shared with the scientific community and the world. Unfortunately, researchers would typically rather do research than write about it. This creates a growing backlog of papers that researchers are required to write with decreasing enthusiasm to finish, and delays the sharing of important knowledge with the world.

At present, hundreds of applications exist that encourage users to practice creative writing, but there are no applications that encourage scientific writing. This application aims to both increase motivation and remove obstacles in the way of researchers finishing their papers.

1.2 Definitions, Acronyms, and Abbreviations

Academic Publishing - The process of distributing academic research by having it published in an academic journal.

Award - A digital badge the user gets when reaching milestones, such as typing over 5,000 words or publishing their first paper.

DOCX - the most recent file format used by Microsoft Word for text documents.

Graphical User Interface (GUI) - A visual way of interacting with a computer using items such as windows, icons, and menus, used by most modern operating systems.

Gamify - To make an action, process or task more like a game. Generally increases the enjoyment or entertainment value of a task.

Hyperlink - A text or image based link to another location or file, most commonly used to link to a website that will be opened in a new web browser tab. These links open upon clicking the link with a mouse.

Key - A piece of digital or biometric data that is used in order to authenticate the identity of an individual or process that is attempting to access an online server or closed network.

LaTeX- An editor that empowers users to define the formatting of the text in advance through markup-level directions and once the content is put into place, the document is ready to be exported in multiple formats such as DOCX, PDF & LaTeX itself.

Leaderboard - a scoreboard, or sorted list, that displays the score or total points of the users. The user with the most points is displayed at the top of the leaderboard.

Peer Review - An academic process by which a scientist's research is scrutinized and judged for accuracy, posterity, and , particularly by their scientific paper. The review can be performed by anyone, but is especially carried out by: editors of a scientific publication journal; experts in the field of research; the researcher's peers in the field of research.

Points - A numerical value that increases by a varied amount depending on what tasks the user accomplishes.

Python - A high level, general purpose programming language with an emphasis on code readability. It supports many different programming paradigms (types of programming with different approaches to solving problems).

Revue - a light theatrical entertainment consisting of a series of short sketches, songs, and dances, typically dealing satirically with topical issues.

Scientist - A person who is studying or has expert knowledge of one or more of the natural, social, or physical sciences. In this case in particular, someone who has a research project that must be written about.

Sensitive Information - Any information that could identify or be used to identify the user or their work in a way that they do not wish disclosed themselves.

Structured Query Language (SQL) - A programming language used for designing and managing data held in a database management system. Used to communicate with databases by updating or retrieving data.

Unique Key Generation - The technical process of generating keys that are unique to each user of the system. This process allows for identity verification.

User Interface - The means by which the user and a computer system interact, in particular the use of input devices and software. In this case, User Interface refers to the means by which scientists and Peer Revue interact.

1.3 Document Organization

Section 1: Information introducing key concepts to the project.

Section 2: Describing the Project's surrounding factors before it is implemented.

Section 3: Describing the program's intended specifications, methods, uses, and implementations.

Section 4: Breakdown of meetings, work affected by each member, stakeholder sign offs and references.[J.2]

2. Project Description

2.1 Project Environment

The system to be has a user interface with a graphical environment where the user can view, save, read and edit documents. The environment will provide graphical components that allow the user to track their progress in the gamified system, such as view their accumulated points.

The software will be self-contained. The boundary of the software will be restricted to the app itself and the user's file storage system. The software will be launched from the user's desktop as an executable and have no other direct interaction with the hardware. The user interface will display a "profile" with an accumulation of the user's achievements, their works published, works-in-progress, and points. An option for the user interface to display a leaderboard will be

available. The software will contain a LaTeX editor and the ability to save and load files of the DOCX and LaTeX file types. The software will need the permission to access the file directory of the computer it is on.

The software will have the capacity to publish the papers upon the user's request. However, the boundary will remain in effect: the software will not ask for any user login on behalf of the publishing website, nor will it access the publishing website itself; the software will only have specific customized hyperlinks to publishing websites the user chooses. This way, the user's data remains secure, as the software does not handle it nor access the internet, cutting off a path for attackers to exploit.

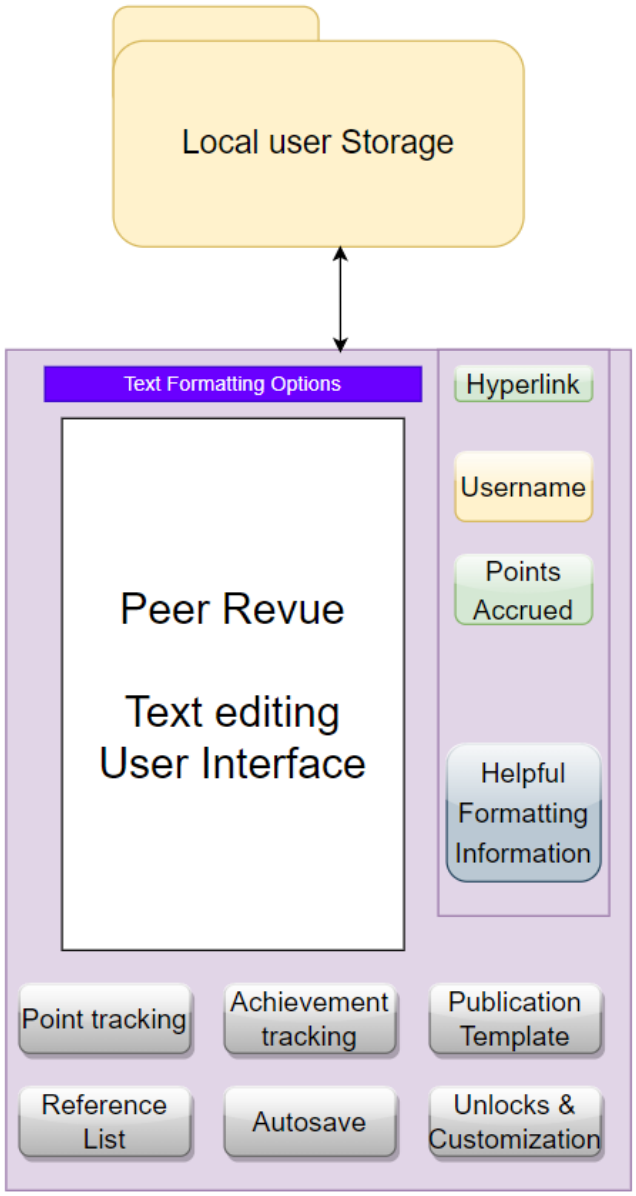

Figure 1: Peer Review components & access overview.

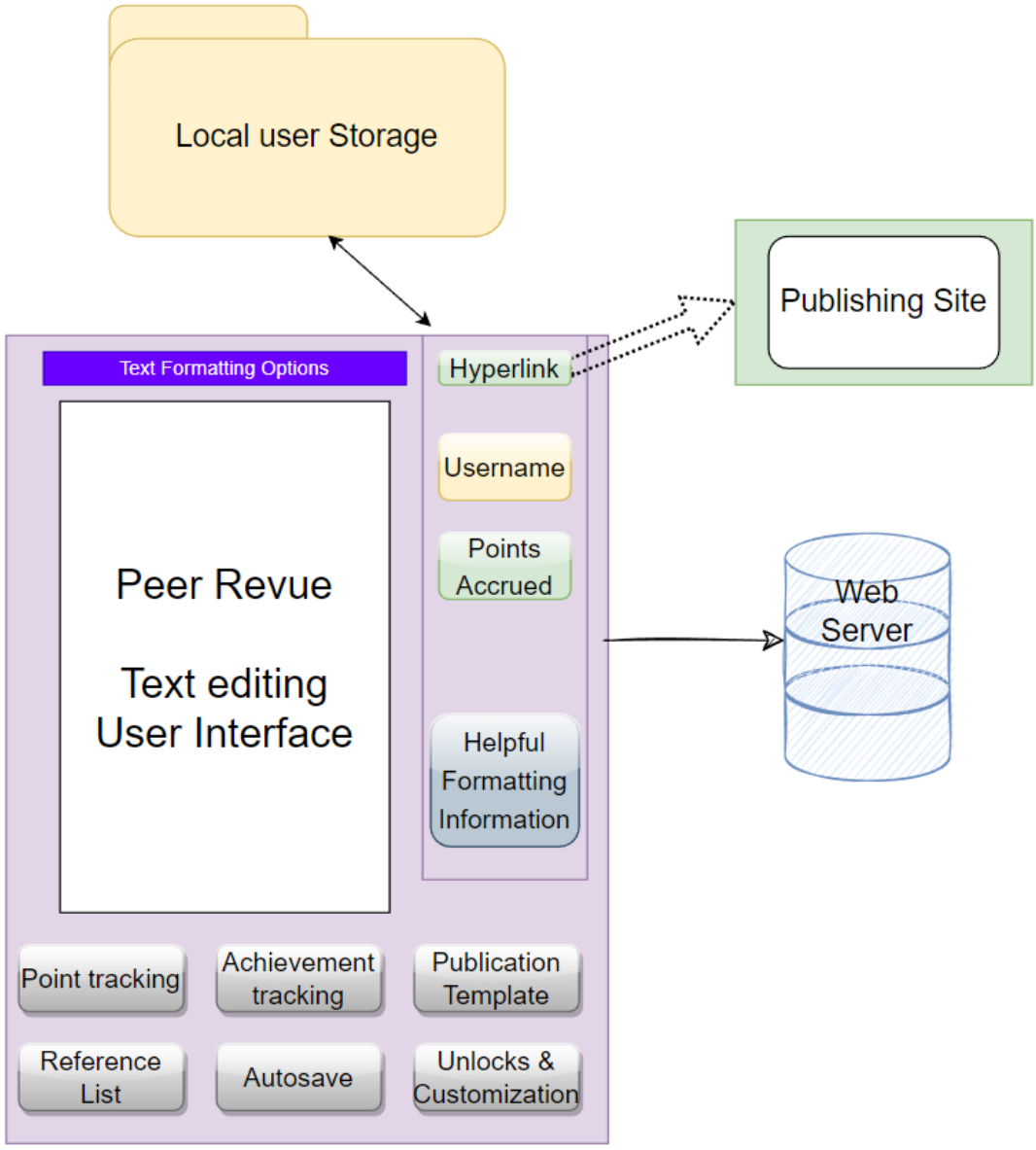

Figure 2: Peer Revue Application Overview, including publishing website & potential future web server "interactions".

2.2 User Characteristics

The user base of Peer Revue will be scientists who have completed research and/or analysis that is adequate for publishing. These individuals will most likely have experience with the standard publishing systems that exist now and will have a range of technical expertise. Their primary concerns will be that their software allows them to publish their research seamlessly, with the integrity of today's popular paper writing and publishing options, with additional features that will alleviate the tedious nature of writing research papers. The scientists would ideally enjoy competitive natures and be motivated by a game-like spirit.

2.3 System Requirements

The system will need a desktop or virtual environment to run on. The system will need a form of text input such as a keyboard. The system shall be able to access the user's computer storage system and directories. The system shall be able to read, write, load and save text files. The system shall store the name of the user and display it. The system shall keep track of adjustments added to the program. The system shall have an automatic save capability to prevent data loss upon crashes or power outages. The system shall grant and display a score for additions to the file in real-time. The system shall edit and format text to the user's choice. The system shall display helpful rules and advice for formatting. The system shall provide templates for each new project. The system shall direct the user to websites of their choice for upload and publication.

The Peer Revue software prioritizes security and confidentiality. The system shall abide by a set of rules to uphold these priorities. The software will have as little direct interaction with the open internet as possible.

Rule 1: There will be no information received from the internet, and therefore no opportunity for an attacker to track or infiltrate the information hosted by the software.

Rule 2: The software will not store sensitive data.

Rule 3: The software will not communicate sensitive data.

Rule 4: The software will not request login information for the publication journal websites the user chooses to publish on.

Rule 5: The software will not store the research paper within itself; it will only read and write to files saved to a local computer storage.

2.4 Assumptions

- The user will be interacting with the Peer Revue application via their personal computer.
- The user has means to save work on their local machine, as it will not be hosted remotely.
- The user will have an internet connection at the time of publication so that they can be linked to the publishing website of their choice via Peer Revue.

2.5 Domain Properties

The users will invariably have research that must be written down in a scientific paper. Scientific papers must be peer reviewed by experts in the field, approved or sent back for edits, and eventually published in a scientific journal. The quality of the scientific paper will be judged by those experts as part of the academic peer review process. A user has the opportunity to abuse

the point system presented in the Peer Revue software, but doing so will become a detriment when the real academic review process begins and their paper is scrutinized by experts and their peers.

2.6 Constraints and Dependencies

- **Compliance (e.g., governmental rules)**

    - Peer Revue is an application provided to users to assist in their publication process by incentivizing completion of their scientific research papers. Other than user malpractice, in which Peer Revue cannot be held liable, Peer Revue has zero compliance constraints or dependabilities.

- **Architectural Constraint (e.g., implementation platform)**

    - In its initial development, Peer Revue will run on a standalone desktop environment for Windows OS devices.
    - Peer Revue will be written in a combination of Python, LaTeX, and SQL. The user interface will be written in Python, the text editor will be written in LaTeX, and the low-priority database that may or may not be implemented will be written in SQL.
    - Implementation of every feature will abide by the rules lain out in section 2.5: Peer Revue will never ask for, store, or communicate sensitive data, and a constraint will be in place to ensure there is no direct internet communication with the software.

- **Development Constraint (e.g., cost, maintainability)**

    - Peer Revue's development is faced with considerable time restraints as the application will have only around nine weeks for development. The application's final deliverable deadline serves as a considerable factor in the development cycle of this application.
    - Peer Revue's development team consists of only four developers, all of which have limited availability and time for development of the application. The limitations on personnel is a significant development constraint.

3. Software Requirements

3.1 User Interface Requirements

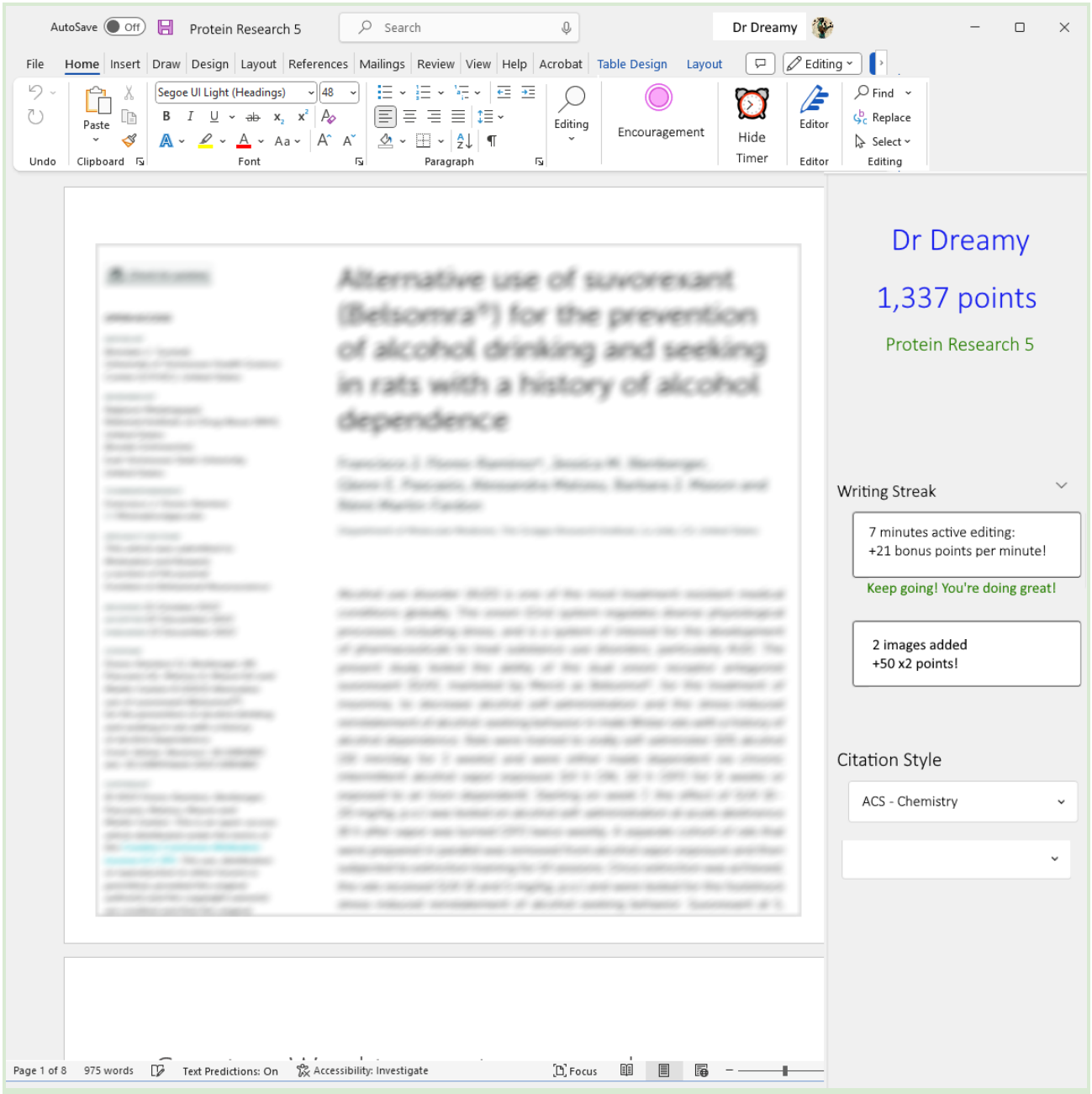

Figure 3: Mockup of the text editor in progress, denoting time spent active in the application and other scorekeeping information

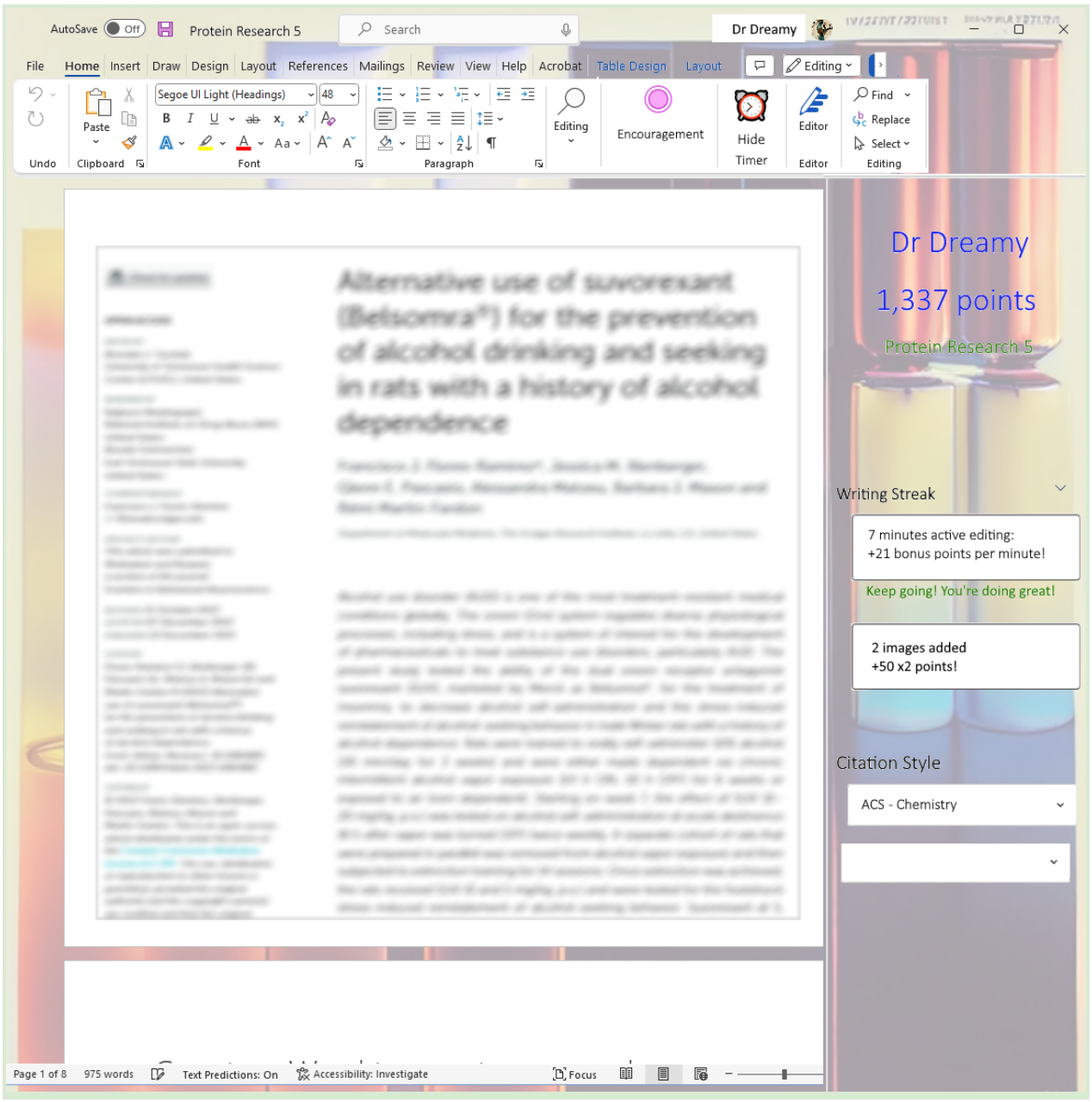

Figure 4: Mockup showcasing customizable features awarded to user.

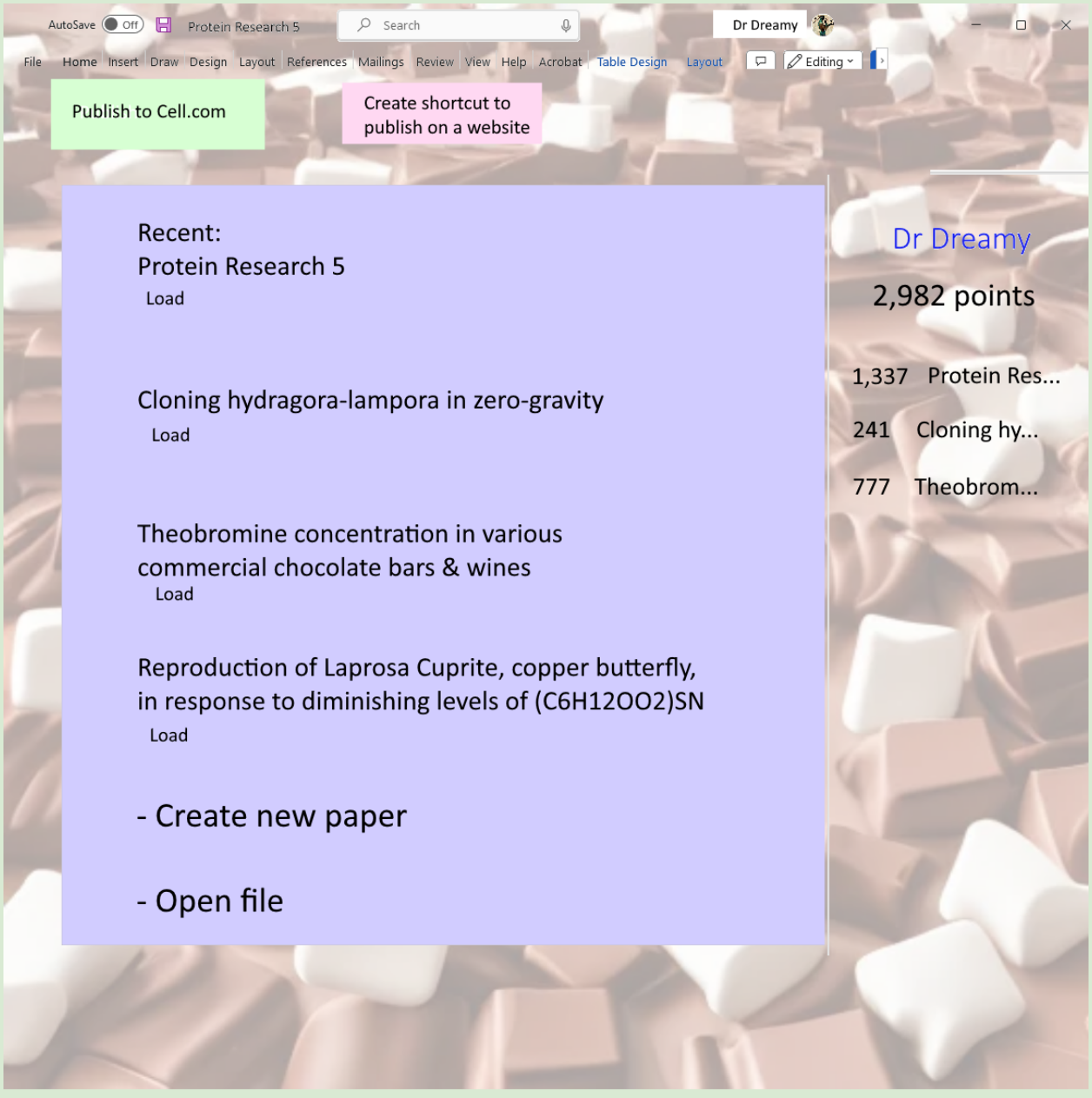

Figure 5: Mockup of the software remembering previous files opened, denoting each one's score and an overall score for the user. Along the top are buttons the user can create customized hyperlinks with to publishing sites of their choice.

3.2 Functional Requirements

Priority Definitions

The following definitions are intended as a guideline to prioritize requirements.

· Priority 1 – The requirement is a "must have" as outlined by policy/law

· Priority 2 – The requirement is needed for improved processing, and the fulfillment of the requirement will create immediate benefits

· Priority 3 – The requirement is “nice to have” which may include new functionality

Req#	Requirement	Priority	Date Rvwd	Reviewed / Approved
FR_01	The system shall track information regarding document development, to include number of words, images, references, and links.	1	16 Feb 2023	
FR_02	The system shall be able to activate the user’s web browser so that the user is directed to the desired publishing website.	2	16 Feb 2023	
FR_03	The system shall support Tex formatted text.	2	17 Feb 2023	
FR_04	The system shall have a point system to track points for when the user accomplishes tasks, such as completing a paper to be submitted and published.	1	20 Feb 2023	
FR_05	The system shall be able to create, read and write documents saved to a user’s local storage.	1	20 Feb 2023	
FR_06	The system shall have an awards system where users receive a digital badge when they accomplish a task.	2	21 Feb 2023	

FR_07	The system shall update a leaderboard on a web service with high scores/number of publications.	3	22 Feb 2023	
FR_08	The system shall autosave at a default frequency of 20 seconds.	2	22 Feb 2023	
FR_09	The system shall provide users the option to change the frequency of autosaves in a settings menu.	3	22 Feb 2023	
FR_10	The system shall provide a pre-formatted and lightly outlined template for each new file (scientific paper) created.	1	22 Feb 2023	
FR_11	The system shall provide a reference of helpful guidelines and rules for scientific publishing.	2	22 Feb 2023	
FR_12	The system shall request and accept a user's preferred nickname upon program startup.	2	22 Feb 2023	
FR_13	The system shall generate a unique key for each installation / user nickname to retain user consistency and discrete identification on the possible future leaderboard.	3	22 Feb 2023	
FR_14	The system shall retain permission to access local computer directories and will prefer to begin searching for documents to open in a specific folder tied to the system.	1	22 Feb 2023	

FR_15	The system shall remember the files that have been previously opened by the software and display them as options to begin writing.	2	22 Feb 2023	
FR_16	The system shall retain a master list of references used for ease of addition and production of a working reference list.	1	22 Feb 2023	

3.3 Reliability

The system shall provide very high dependency with minimal risks of crashing and data loss; less than 1% of Peer Revue users shall ever experience an application crash and less than 0.1% of writing sessions in Peer Revue shall result in an application crash. If an unlikely crash were to occur, the reliability provided by Peer Revue's auto-saving features shall prevent any significant losses in work. The document shall auto-save every 20 seconds by default. This frequency will be adjustable via user settings, but that frequency shall be met in order to provide satisfactory reliability.

Req#FR_08 and ***Req#Fr_09*** will satisfy the reliability requirements on auto-saving features.

Req#FR_14 and ***Req#FR_15*** address the speed at which the software will access local storage and begin the loading / saving processes.

3.4 Security

The system shall have zero preventable vulnerabilities in which sensitive or confidential user data may be exposed to, or acquired by, any unauthorized third parties. Sensitive user data may include account information such as passwords when Peer Revue adds such features for the sake of online leaderboards and connectability. Notably, sensitive user data also includes the contents of the papers written; it is vital for Peer Revue to uphold the protection of the information and research within an author's saved files so that their original written work is not disclosed to or accessed by anyone else until the Peer Revue user chooses to publish the work via the appropriate, authorized channels.
Such data will be completely inaccessible without direct access to a user's machine. 0% of written work will be remotely accessed by third parties.

Req#FR_02 ensures the software does not receive, connect to, or store user login information for their preferred publishing site; the software only contains a hyperlink to the website, provided by the user, for ease of access.

Req#FR_05 and ***Req#FR_14*** address local file management on a user's machine.

Req#FR_07 ensures the software has **only outgoing** information to a specific website component of the system, with no incoming connection, and therefore no opportunity for attackers to infiltrate.

Req#FR_13 will protect online security for user leaderboards using unique key generation, sending only non-sensitive information otherwise useless to an attacker.

3.5 Performance

The user shall be able to rely that the PeerRevue program will function quickly and efficiently on their computer. The PeerRevue program will do real time calculations to track awards and points while still allowing the user to type and edit their document without being interrupted. 95% of the real-time edits and point-tracking shall be processed in less than 1 second.

Req#FR_01 and ***Req#FR_03*** address the LaTeX editor and will rely on its speed to uphold fast performance.

Req#FR_08, Req#FR_10, and ***Req#FR_11*** address the speed impact of automated saving and new file generation.

Req#FR_14 and ***Req#FR_15*** address the speed at which the software will access local storage and begin the loading / saving processes.

4. Requirements Confirmation/Stakeholder sign-off

Meeting Date	Attendees (name and role)	Comments
2 / 22 / 2023	• Jeff Lane (Project Owner and Developer) • Antonio Biello (Developer) • Chad Etchebarren (Developer)	Confirmed FR_1 - FR_16

	• Jordan Aquino (Developer)	
Future Meeting Pending		

References

List all the documents and other materials referenced in this document. Please number all the references and explicitly cite them in the document.

Appendix

Appendix A. Interview Questions/Answers with Project Stake Holders (e.g., Project Owner, Users)

Appendix B. Letter of Approval from Project Owner

Adapted from the IEEE Std 830-1998: IEEE Recommended Practice for Software Requirements Specifications.
