

Requirements Specification Document for IntelliGen AI-Powered Content Tool for Social Media and Digital Marketing

Company: OmniWorks

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1 Revision History

Name	Date	Reason for Changes	Version
OmniWorks	Sep 26, 2024	Requirements Document Creation	RD 1.0
OmniWorks	Oct 24, 2024	Requirements Specification Document 1.0	RSD 1.0
OmniWorks	Nov 7, 2024	Requirements Specification Document 2.0	RSD 2.0
OmniWorks	Nov 22, 2024	Requirements Specification Document 3.0	RSD 3.0
OmniWorks	Dec 3, 2024	Requirements Specification Document Final	RSD Final

2 Introduction

This section introduces the IntelliGen system and includes various details about the project purpose and scope.

2.1 Purpose

This document specifies the requirements of the IntelliGen 1.0 content tool for social media and marketing. This content tool will use our software to generate textual and visual media using AI. IntelliGen will be a standalone web application that supports seamless integration with existing digital platforms.

2.2 Project Scope

The IntelliGen software will utilize AI to generate and modify textual, photo, and video content that individuals and businesses can use to drive customer traffic and engagement. IntelliGen will allow users to reduce the time and financial resources typically associated with marketing and social media work. Benefits of this software include universal cross-platform posting, facilitating marketing campaigns across large client bases, and auto-extraction of audience engagement data.

We aim for the resulting content to achieve the following

- Align with corporate talking points and marketing strategies
- Cohere with the brand identity and personality of smaller creators
- Match the style and tone of the corresponding digital platform.
- Adhere to an optimization plan of effectiveness for content and AI models
- Leverage generic and targeted marketing schemes to increase user engagement and customer satisfaction

2.3 Glossary of Terms

Table 2.3.1 Glossary of terms

Term	Definition
AI	Acronym for “Artificial intelligence” which is the use of machine learning algorithms to produce material similar to human abilities.
GDPR	Acronym for “General Data Protection Regulation” which is the European Union’s regulations on handling digital personal information.
Self Iteration Report	A report provided by the system that explains self improvements made in the AI’s content generation behavior. For example, if the software recognizes that posts using the word “fashionable” perform poorly compared to posts using the word “trendy”, then the AI will generate more “trendy” posts and the system will note this change in the self-iteration report for the user.
Self Iteration	The ability to adapt and improve over time based on past tasks and automatically adjust accordingly without manual intervention.
Cross-Post	To universally post material to multiple platforms without needing to configure the post to be compatible for each of the platforms.
API	Acronym for “Application Programming Interface”.

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2.5 Overview

This document outlines the requirements for the IntelliGen web application. The first section introduces the purpose, scope, and contextual uses of the IntelliGen product and defines uncommon project-specific terms. Next, the overall description provides some background info on the beginnings of the Idea for IntelliGen and briefly touches on system features. This section also identifies the distinct user classes of IntelliGen, the environment in which users will interact with the software followed by constraints and current assumptions in development. The system feature section expands on the features that the overall description summarized, addressing specific requirements for each feature to establish a level of acceptability. Subsequently, the interface section details the menus and UIs that users will experience along with the background interfaces that support the system functionality. Lastly, section five covers non-functional requirements followed by currently unresolved items in the appendix.

3 Overall Description

This section describes the IntelliGen system in greater detail and outlines the various product features, characteristics, constraints, and dependencies that apply.

3.1 Product Perspective

The IntelliGen web application will debut as the first member of its product family. The concept for IntelliGen evolved out of the need to reduce the resources used for marketing and social media combined with the advancing generative capabilities of emerging AI models. The IntelliGen product encompasses the entirety of the web application and its functions. However, IntelliGen will communicate with other platforms, such as LinkedIn, Facebook, Instagram and X/Twitter, to distribute the content that it creates.

3.2 Product Features

IntelliGen will have functionality that allows users to generate and modify textual, photo, and email content. Users will message an IntelliGen bot account on their desired platform to access the tool, or they can input prompts in the standalone web app. Prompts will include text, images, documents, or folders, and users can toggle the complexity of their input according to their technical experience. IntelliGen users can opt for manual and scheduled automated posting of their content. The IntelliGen tool will interact with various platforms, including LinkedIn, Facebook, Instagram and X/Twitter, allowing users to cross-post items as needed. An approval feature enables users to review and revise the processed output before release. After content releases, users can analyze and address critical customer interactions in an interaction feature. Over long periods, users can use a trends feature to view content performance statistics across all platforms. IntelliGen can also use these statistics to self-iterate the optimization and personalization of posts based on platform performance metrics.

3.3 User Classes and Characteristics

The anticipated IntelliGen users group into three user classes. First, the marketing user class consists of high-frequency, highly technical users who work in marketing departments of very large businesses, or are familiar with marketing creation tools such as Adobe. This user class will likely use the web app, posting manually and utilizing the trends feature. Secondly, the corporation class, consisting of small to medium-sized businesses, forms a group of medium-frequency and moderately technical users who may be somewhat familiar with marketing tools through indirect use in their company. Users in this class will likely interact with the web app using the automated posting, trends, and approval features. Lastly, the influencer class includes individuals and social media creators as low-frequency minimally-technical users. Individuals in this class, which we will consider smaller content creators, will rank on the lower end of the technicality spectrum. Individuals will have limited existing content so they will use the generative features of IntelliGen, albeit minimally, as media interaction is not their primary occupation. Social media creators will have a little more technical ability but will mostly use IntelliGen to enhance already existing content so the usage level of social media creators will roughly equal the usage level of individuals. Influencer class users will likely use the chatbot feature within their desired platform in addition to the automatic posting, trends, and approval features. While the IntelliGen system aims to satisfy all users, the system targets optimizing the user experience specifically for the small business user class, as these users do not have the resources and flexibility to continue using legacy creation methods.

3.4 Operating Environment

IntelliGen will run as a web app on all the major desktop and mobile platforms and operating systems. Furthermore, IntelliGen will generate marketing content for most common social media applications such as LinkedIn, Facebook, Instagram and X/Twitter. Updates to IntelliGen software will ensure our users have a stable experience regardless of changes in the software of these third-party apps. Lastly, given the variety of available AI products, IntelliGen's underlying architecture will allow the development team to interchange smoothly between the most optimal generative models.

3.5 Design and Implementation Constraints

To develop a successful application, the implementation of IntelliGen must adhere to the following constraints. First, the IntelliGen interface must support user communication with IntelliGen by creating a bot account on the users' desired platform(s). Secondly, the AI implementation must generate text and images in under 1 minute. Next, the servers must protect customer data in adherence with GDPR. Lastly, the input replication software must approximate the company's branding using only visual prompts with no additional text input from the user. This replication software prevents new users from starting from scratch and provides lengthy descriptions to get the theme they want.

3.6 Assumptions and Dependencies

Regarding the development of IntelliGen, the team assumed the following factors

1. Existing AI models are capable of generating content comparable to traditional creative processes
2. All major platforms, such as LinkedIn, Facebook, Instagram and X/Twitter, will approve the use of IntelliGen chatbots

The success of IntelliGen will largely depend on the machine learning capabilities of the supporting AI model. Additionally, the product depends on compatibility between the platform APIs and chatbot functionality. The IntelliGen team does not foresee any other dependencies at this time.

4 System Features

This section outlines all of the system features, and includes functional requirements and use cases.

4.1 IntelliGen AI Chatbot

4.1.1 Description and Priority

The IntelliGen AI chatbot helps users through the native messaging interface of each social media site. The chatbot will facilitate the generation and modification of user content. The client considers text-based content (posts, tweets etc.) a high priority feature and the client considers image generation as a medium priority feature.

4.1.2 Functional Requirements

- REQ-1-1: **Requirement:** Each chatbot must recognize the social platform in use and produce content of the appropriate tone based on the tone guidelines predefined for that platform. **Rationale:** Users need the generated content to align with the style of the associated platform to reduce the need to modify the content. For example, if the chatbot retrieved a generated tweet which was supposed to be an instagram post, the user will need the generation modified which degrades the user experience.
- REQ-1-2: **Requirement:** Users must have access to the chatbot from the native messaging of social media platforms including LinkedIn, Facebook, Instagram and X/Twitter in addition to having access to the chatbot from the IntelliGen web app. **Rationale:** If users always need to navigate to the main IntelliGen website, this will increase user friction and reduce the simplicity of using the IntelliGen product. Thus, the chatbot must be accessible from third party platforms.
- REQ-1-3: **Requirement:** Users must have access to their conversation history with the chatbot using a full chat log (retention period TBD). **Rationale:** The user may want to reference previous requests they made to the chatbot or the user may want to reference previous responses the chatbot provided.
- REQ-1-4: **Requirement:** The chatbot must provide personalized marketing suggestions based on previous and current user prompts and preferences. **Rationale:** The system must not just provide the content but also provide the same expertise that a customer would receive from a marketing agency in order to enhance the results of the IntelliGen user's digital presence.
- REQ-1-5: **Requirement:** The chatbot must also suggest specific and relevant marketing or editing features on the platform to the user. **Rationale:** The system must inform the users of additional IntelliGen features that can enhance their use of the application in order to increase the value the app provides to the user.
- REQ-1-6: **Requirement:** If the chatbot cannot respond to a prompt or the user enters inappropriate input, the bot must inform the user and suggest alternative prompts. **Rationale:** The user needs to receive the information that the system will not process their prompt.

4.1.3 Use Cases

4.1.3.1 Use Chatbot	
ID: UC 1-1	
Description:	The user can use the chatbot to generate or modify content and view chat history.
Actors:	User
Secondary Use Cases:	N/A
Preconditions:	The user has connected their IntelliGen account to the platform(s) they wish to message the chatbot on. The user has previously messaged the chatbot if they wish to view their chat history.
Main Flow:	<ol style="list-style-type: none">1. The user navigates into the native messaging interface of their desired platform or the IntelliGen chatbot interface.2. If the user wants to modify their content:<ol style="list-style-type: none">a. The user request to the modify option in their response and makes the modificationb. The AI modifies visual and textual content the user sends to the chatbot.c. The chatbot returns the modified content via message to the user.3. If the user want to view their chat history:<ol style="list-style-type: none">a. The user scrolls up in the chat.
Postconditions:	The user has acquired their generated or modified content. The user viewed their chat history as desired.
Alternative Flow(s):	<ol style="list-style-type: none">2. If the user wants to generate new content<ol style="list-style-type: none">a. The user inputs a prompt to generate contentb. The AI generates content from the textual and visual input the user sends to the chatbot.c. The chatbot returns the AI generated content via message to the user.2. If the chatbot cannot respond to a prompt or the user enters inappropriate input:<ol style="list-style-type: none">a. The chatbot informs the user and suggests alternative prompts.

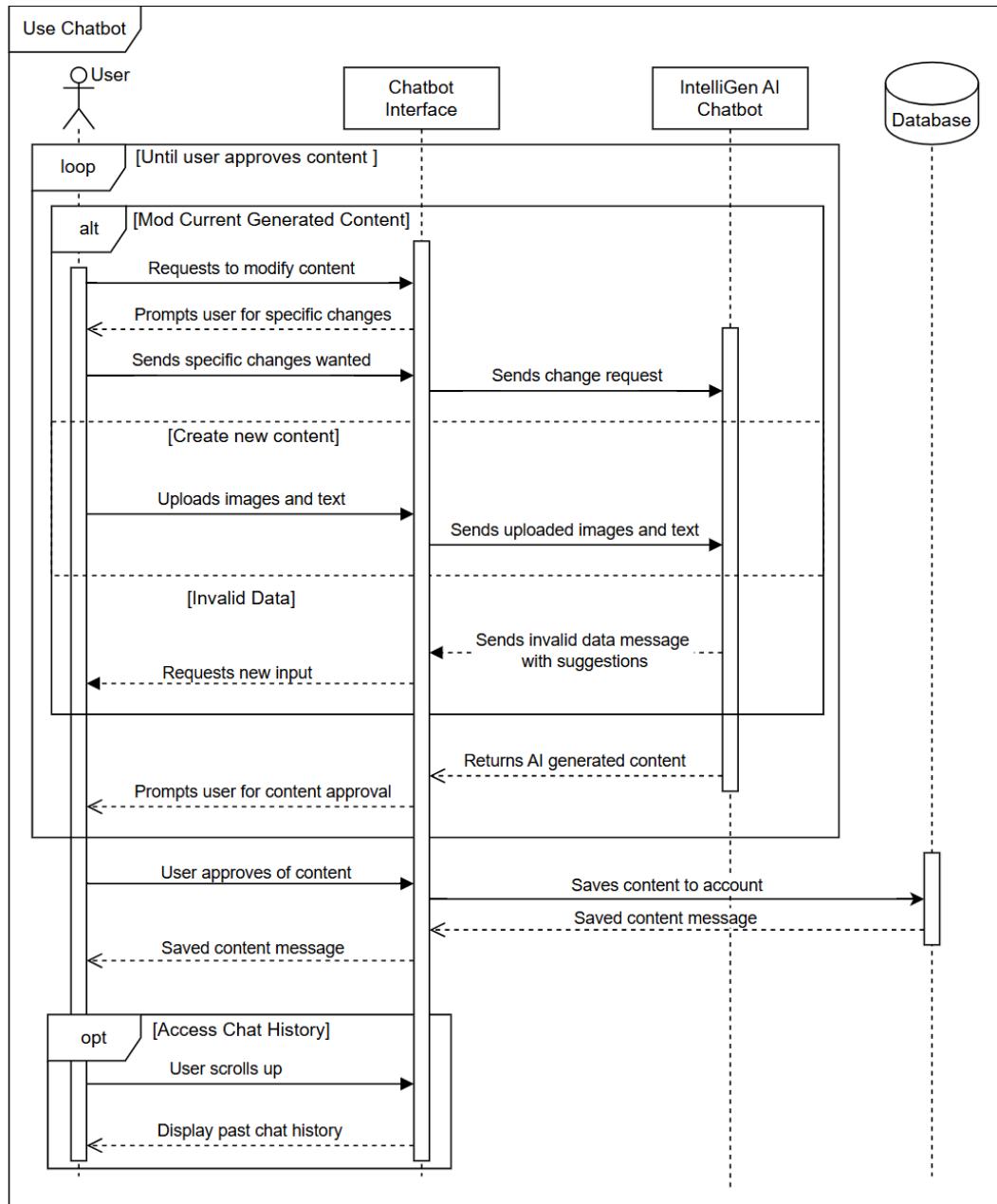


Figure 4.1.3.1 Use chatbot sequence diagram

4.1.3.2 Receive Chatbot Suggestions	
ID: UC 1-2	
Description: The user can receive usage suggestions from the chatbot about marketing and different marketing and editing tools they should use.	
Actors: User	

Secondary Use Cases: UC-1-1 Use Chatbot

Preconditions: The user has already had a previous interaction with the chatbot.

Main Flow:

1. If the user is not in the chat with the chatbot:
 - a. The user navigates into the native messaging interface of their desired platform or the IntelliGen chatbot interface and proceeds to message the chatbot.
2. If the user would like to receive suggestions:
 - a. The user replies to the bot to accept the suggestions.
 - b. The user views the suggestions.

Postconditions: The user has acknowledged the suggestions from the chatbot.

Alternative Flow(s):

2. If the user would not like to receive suggestions:
 - a. The user replies to the bot to decline the suggestions or the user leaves the chat.

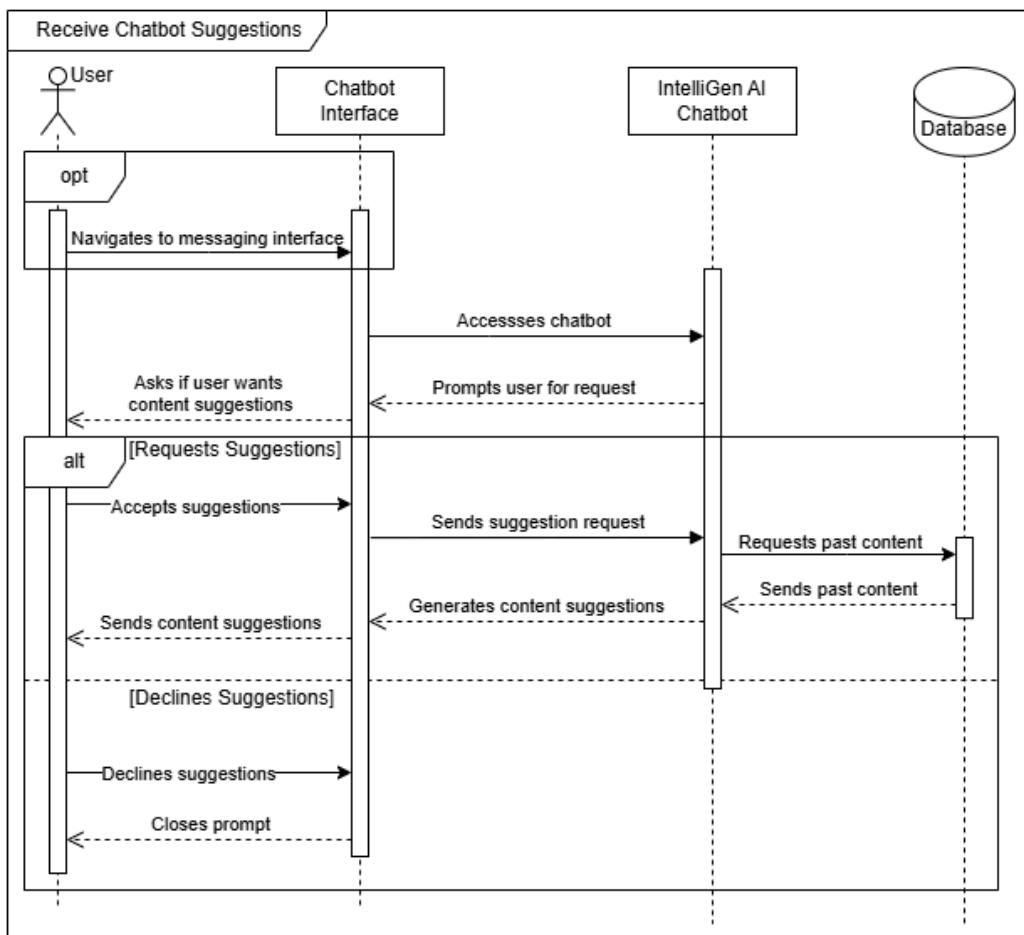


Figure 4.1.3.2 Receive chatbot suggestions sequence diagram

4.2 Brand Creation

4.2.1 Description and Priority

Brand creation gives users the ability to generate branding for their businesses by uploading and saving information about their products/services. The client considers this an experimental and thus low-priority task.

4.2.2 Functional Requirements

- REQ-2-1: **Requirement:** The feature must assist users in creating taglines by providing a minimum of three tagline suggestions based on keywords, product/persona descriptions, and brand guidelines submitted by the user. **Rationale:** As a marketing and social media tool, Intelligen must facilitate the creation of taglines because taglines are a critical part of any marketing or social media presence.
- REQ-2-2: **Requirement:** The feature must request users upload photos along with any product name, descriptions, and price for use in brand creation suggestions. **Rationale:** In order to provide brand creation suggestions, the system must familiarize itself with the user's brand identity.
- REQ-2-3: **Requirement:** The feature must provide specific suggestions for branding improvements or prompt the user for missing information based on brand logos, taglines, or product descriptions inputted by the user. **Rationale:** The system must not just provide the branding but also provide the same expertise that a customer would receive from a marketing agency in order to enhance the branding of the IntelliGen user.

4.2.3 Use Cases

4.2.3.1 Create Brand
ID: UC 2-1
Description: The user can receive AI generated taglines and brand content ideas.
Actors: User
Secondary Use Cases: N/A
Preconditions: The user has prepared the necessary product/persona information required for brand creation.
Main Flow:
<ol style="list-style-type: none">1. The user uploads product photos, product name, product description and price, and submits keywords and brand guidelines.

2. The user views a portfolio of the taglines and branding ideas for their product/persona.

Postconditions: The user has acquired taglines that reflect their brand/persona.

Alternative Flow(s): N/A

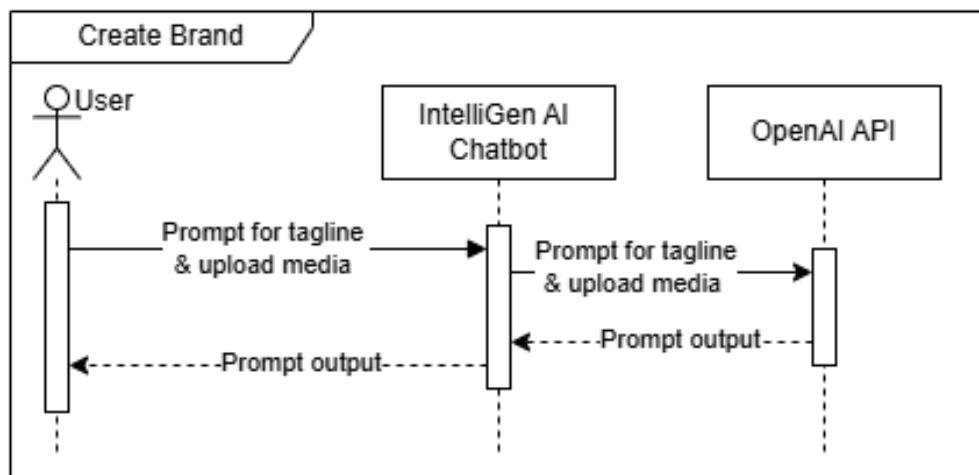


Figure 4.2.3.1 Create brand sequence diagram

4.2.3.2 Improve Branding

ID: UC 2-2

Description: The user can receive suggestions or requests for more product/persona info to improve the quality of their brand creation.

Actors: User

Secondary Use Cases: UC-2-1 Create Brand

Preconditions: The user has already created a brand using the Brand Creation feature.

Main Flow:

1. The user asks for improvements in branding using the chat.
2. If no additional info is needed
 - a. The user receives suggestions of possible improvements.

Postconditions: The user has acknowledged branding suggestions.

Alternative Flow(s):

2. If the prompt also asks for more info about the user's product/persona:
 - a. User reuploads more product photos, product description, product keywords or brand guidelines.

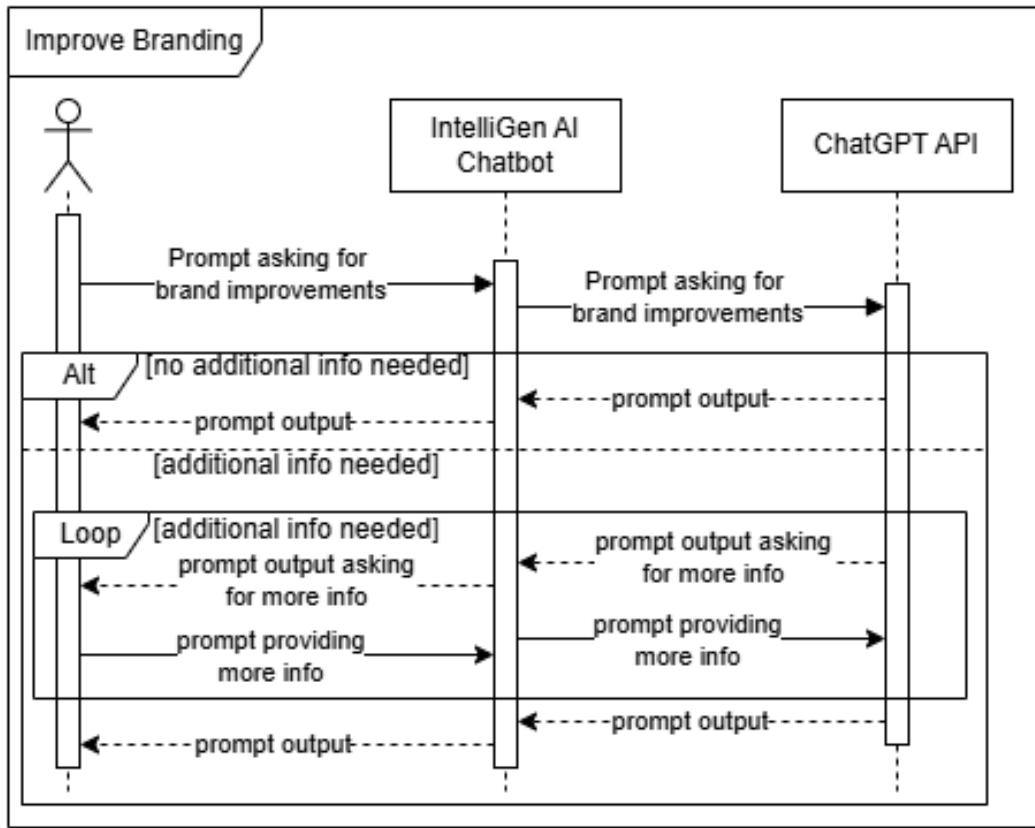


Figure 4.2.3.2 Improve branding sequence diagram

4.3 Trends Analytics

4.3.1 Description and Priority

Trend analytics compiles all of the analytics gathered from the social media platforms where the content is being posted. The feature formats the information to indicate the overall performance of each social media platform, as well as the performance of each post. The client considers this as a medium priority.

4.3.2 Functional Requirements

REQ-3-1: **Requirement:** The system must show the user all of the gathered analytics through the native analytics interface for each social media platform. **Rationale:** IntelliGen users are accustomed with the analytics provided by their preferred social media platform. Therefore, the IntelliGen system must aggregate the analytics without alteration to eliminate the learning curve of its trends and analytics feature.

REQ-3-2: **Requirement:** Based on performance metrics, the system must provide a breakdown of the overall performance of each social media, including weak and

strong points of their content (thresholds for performance TBD). **Rationale:** The IntelliGen user needs to receive information that their content is performing well or poorly.

REQ-3-3: **Requirement:** The system must identify critical consumer interactions for review by the user. **Rationale:** The IntelliGen user needs to receive information if a consumer reacted extremely negatively to their content in order to limit the detrimental effect to their marketing or social media efforts. Additionally, the IntelliGen user needs to receive information if a consumer reacted extremely positively so that the user can understand how to drive further enthusiastic interactions with their content.

REQ-3-4: **Requirement:** IntelliGen must analyze gathered performance data to self-iterate and optimize content processing and provide a self-iteration report to the users. **Rationale:** The system needs to improve its content abilities as the user's usage increases in order to streamline content processing for experienced users and encourage new users to continue using the app.

4.3.3 Use Cases

4.3.3.1 View Trends and Analytics	
ID: UC 3-1	
Description:	The user can view info about their content's performance and content improvement using the trends feature.
Actors:	User
Secondary Use Cases:	N/A
Preconditions:	The number of consumer interactions meets the required threshold for accurate performance analysis by the software, which is determined by the user in conjunction with suggested metrics from the system.
Main Flow:	<ol style="list-style-type: none">1. The user navigates into the trends feature tab.2. The user views widgets detailing the following information:<ol style="list-style-type: none">a. Native analytics from each platform.b. Analytics breakdown displaying weak and strong points of their content.c. Critical consumer interactions for review by the user.d. Changes in the softwares generation behavior due to self-iteration.
Postconditions:	The user has acquired information about the performance of their content and content improvement suggestions.

Alternative Flow(s): N/A

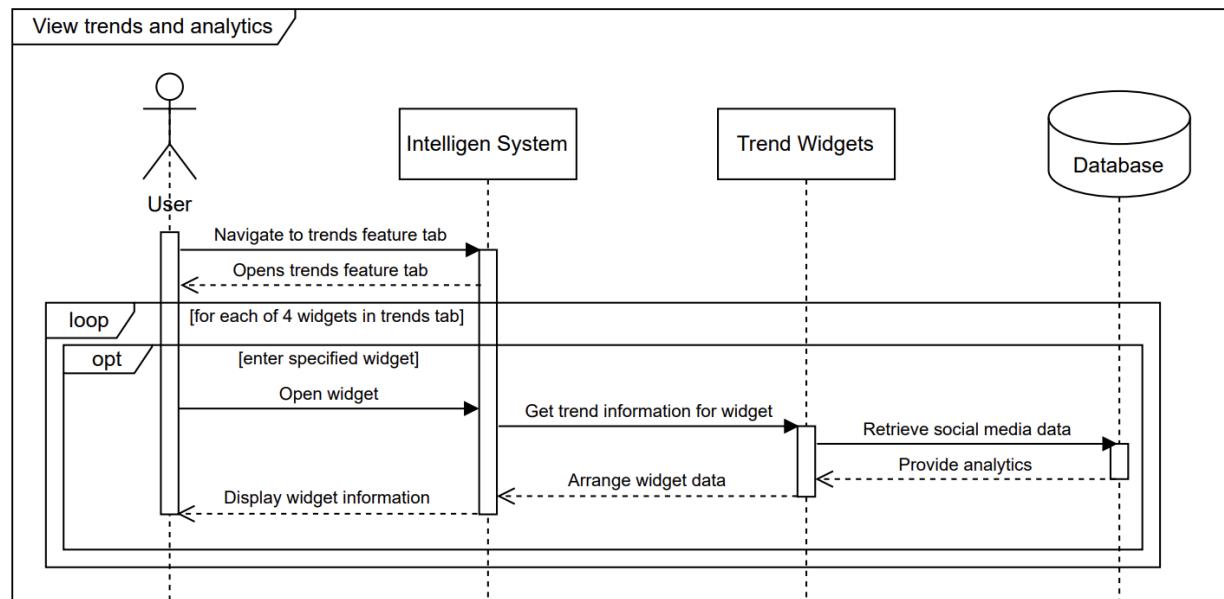


Figure 4.3.3.1 View trends and analytics sequence diagram

4.4 Content and Data Approval

4.4.1 Description and Priority

The IntelliGen approval feature will require human approval before sharing any generated content. The approval mode will be toggled on by default. Otherwise, if the user has approval mode toggled off, then sharing will proceed without needed approval. The approval feature will also include functionality for the user to approve the storage of data and delete data. This data is a byproduct of the content generation and serves no purpose to the user. Therefore, users must download any desired data prior to deletion. The client considers the approval feature a medium-priority requirement.

4.4.2 Functional Requirements

REQ-4-1: **Requirement:** The system must make generated content available for approval by the user if the user toggled approval mode on. **Rationale:** The user needs to be able to accept or reject content generations in order to establish control of what content gets posted out to their accounts.

REQ-4-2: **Requirement:** Sharing must proceed unchecked if the user has approval mode toggled off unless the system flags the content as harmful or offensive.

Rationale: The system needs the ability to minimize the amount of user interaction required for content processes. However, the user needs to receive information if the system flags generated content.

REQ-4-3: **Requirement:** The system must provide messages to the user throughout the content generation process notifying the user to check the quality of the content (message contents TBD). **Rationale:** At a minimum, the system should encourage a non-extensive level of user interactions simply to prevent complete user complacency with the content generation process.

REQ-4-4: **Requirement:** The user must approve which information IntelliGen can store from the data collected during content generation and the system must allow for the deletion of previously stored data. **Rationale:** Users need to be able control the data IntelliGen stores in order to ensure their sense of security while using the application.

REQ-4-5: **Requirement:** The system must allow for remake requests for generated content if the content does not meet the user's criteria or standards. **Rationale:** Users should not feel forced to post content that they find unsatisfactory.

4.4.3 Use Cases

4.4.3.1 Approve Content	
ID: UC 4-1	
Description:	The user can manually review and revise generated content before posting.
Actors:	User
Secondary Use Cases:	N/A
Preconditions:	The user has toggled approval mode on.
Main Flow:	<ol style="list-style-type: none">1. The user navigates to the content approval tab:2. (Optional) If the system is generating content while the user is in the content approval tab:<ol style="list-style-type: none">a. The user can see messages notifying the user to check the generated content quality.3. The user opens the “Generated Content” folder.4. The user reviews the content in the “Generated Content” folder.5. If the user approves the content:<ol style="list-style-type: none">a. The user ticks the content as “approved for sharing”.
Postconditions:	The user has approved the generated content and proceeded to share the content. Otherwise, if the user did not approve of the content, the user requests a remake with the option of changing specifications.
Alternative Flow(s):	<ol style="list-style-type: none">5. The user does not approve the content:<ol style="list-style-type: none">a. The user requests a remake of the content

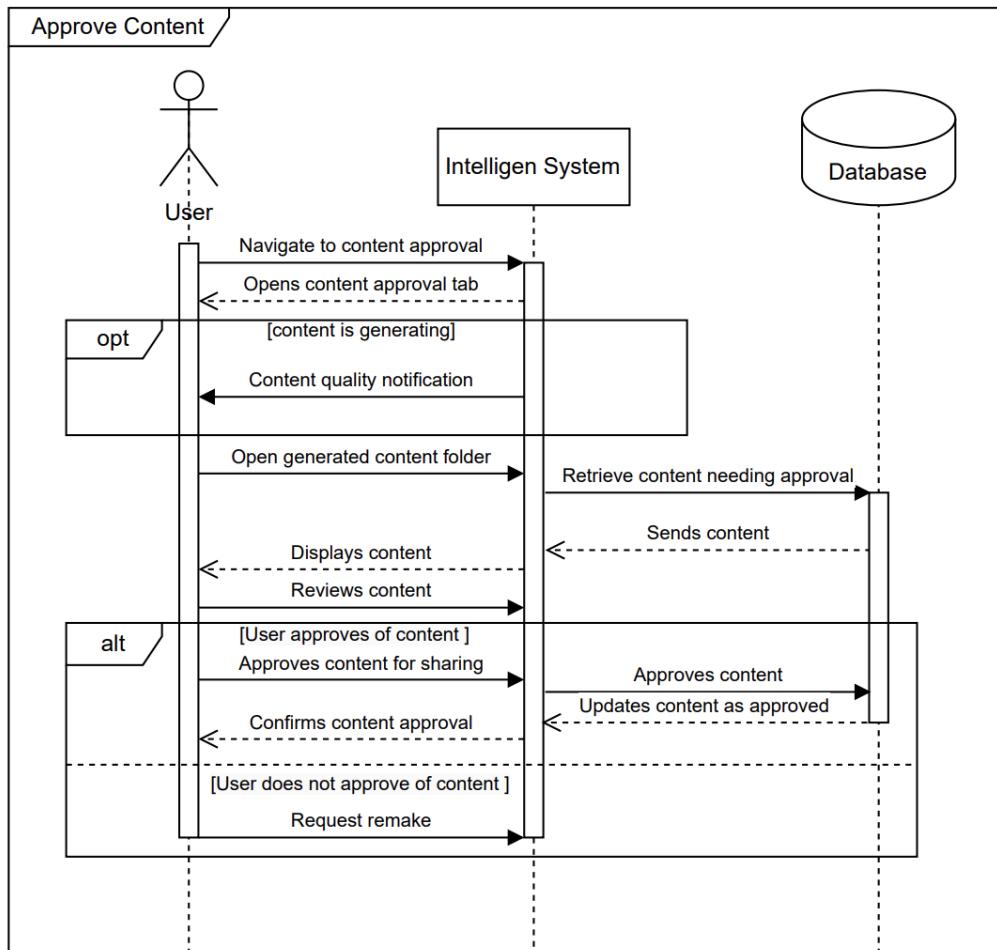


Figure 4.4.3.1 Approve content sequence diagram

4.4.3.2 Approve Content Data Management	
ID: UC 4-2	
Description:	The user can approve which data IntelliGen stores.
Actors:	User
Secondary Use Cases:	N/A
Preconditions:	The user is a new user or the user wants to adjust their data storage preferences.
Main Flow:	<ol style="list-style-type: none"> 1. During the process of their account setup, they user can set their data storage preferences: <ol style="list-style-type: none"> a. The user is prompted to select which data IntelliGen stores and for what duration of time.

Postconditions: The user approved which data IntelliGen stores in data storage preferences. The user can go back and readjust their data storage preferences in the Settings Menu at any time.

Alternative Flow(s):

2. The user wants to adjust their data storage preferences:
 - a. The user navigates from the Approval feature directly to the Settings Menu.
 - b. The user selects which data IntelliGen stores within the Settings Menu.

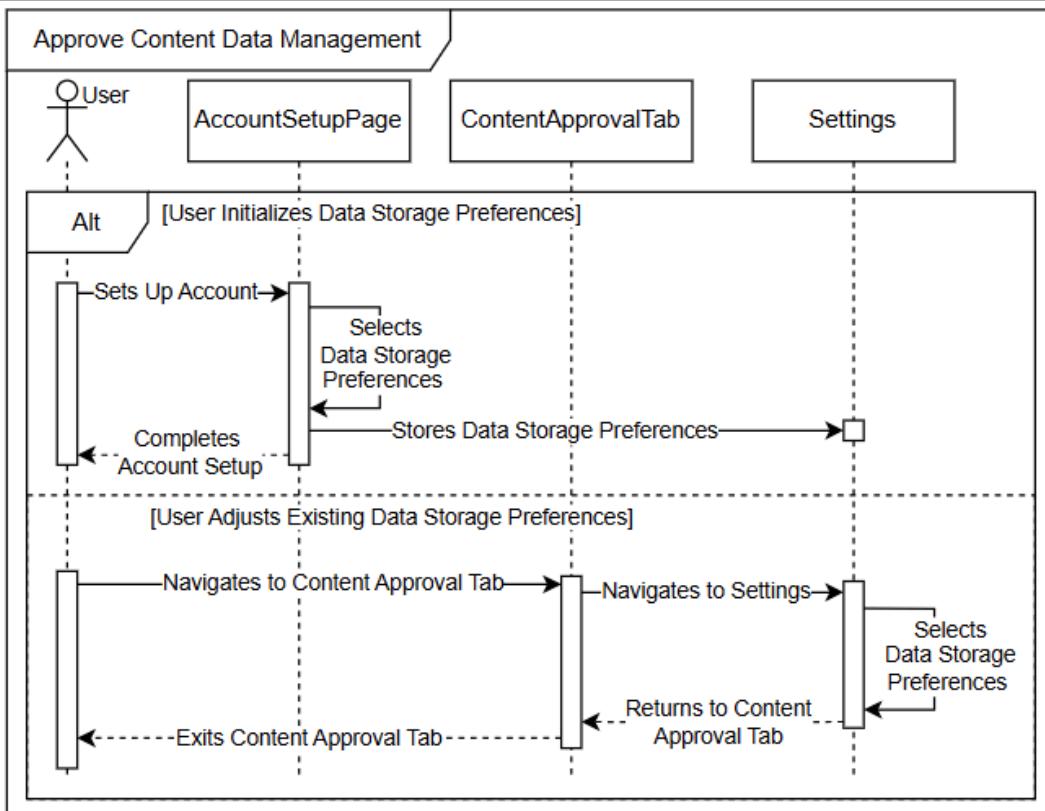


Figure 4.4.3.2 Approve content data management sequence diagram

4.4.3.3 Delete Previously Stored Data

ID: UC 4-3

Description: The user can have previously stored data deleted.

Actors: User

Secondary Use Cases: UC 4-2 Approve content data management

Preconditions: The user has existing data they wish to have deleted.

Main Flow:

1. The user navigates to the content approval tab
 - a. The user selects the “Content Data” folder.
 - b. The user deletes any existing data they wish to delete.

Postconditions: The user has previously stored data deleted as desired.

Alternative Flow(s):

1. Based on the previously determined data storage preferences
 - a. The system deletes data after the specified period of time.
 - b. The system deletes data if it violates IntelliGen data storage terms

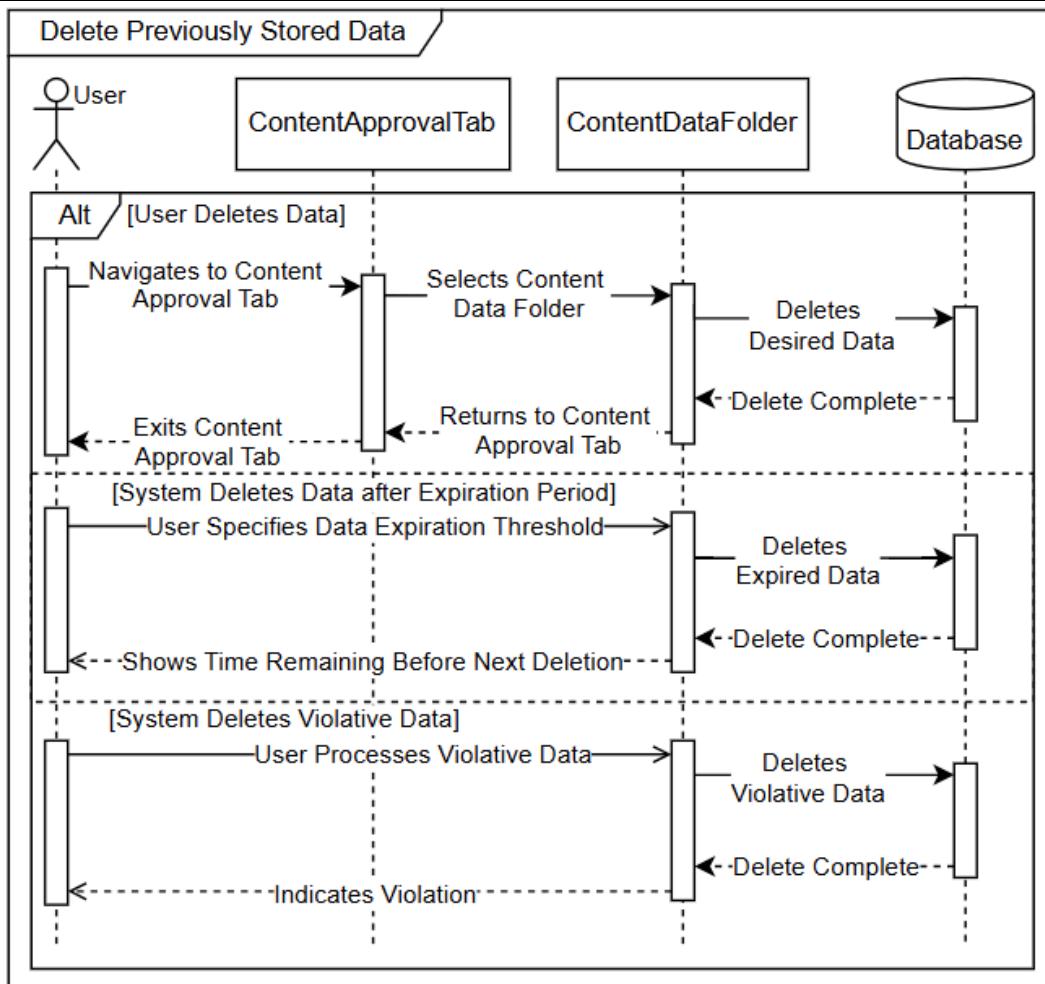


Figure 4.4.3.3 Delete previously stored data sequence diagram

5 External Interface Requirements

This section describes the external interfaces that apply to the IntelliGen system.

5.1 Interaction with the Interfaces

The image in **Figure 5.1.1** is a use case diagram representing the use cases outlined in section 3.

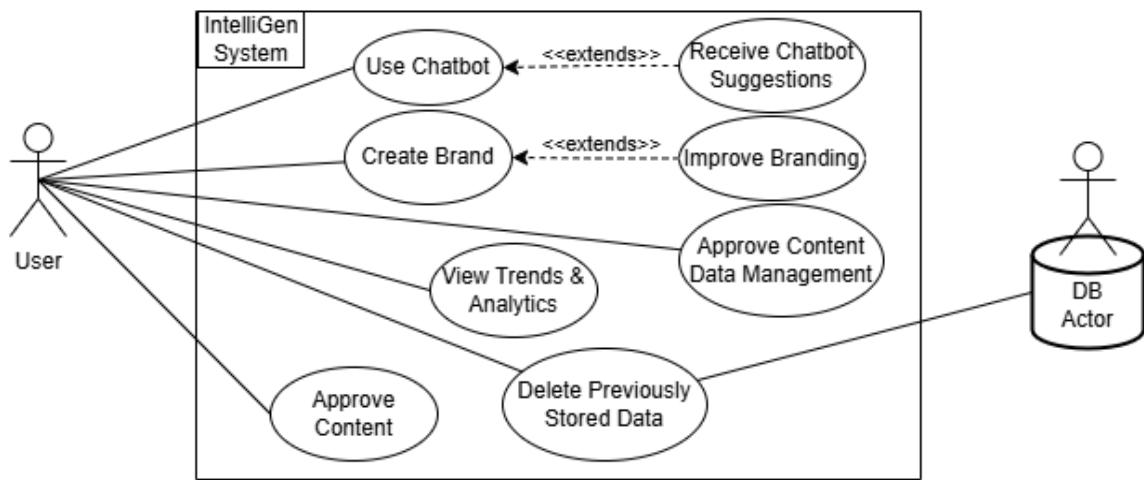


Figure 5.1.1 UML use case diagram for all use cases

5.2 User Interfaces

5.2.1 Primary UI - Web App

Users can directly access the bulk of our software through the IntelliGen web app. The web app design prioritizes desktop functionality but mobile users will have access to all the same features. Different menus will be used for each aspect of the system to make the user experience seamless and intuitive.

Initial Setup Menu

Users can access the Initial Setup Menu only once when they first create a new account. In this menu, users can upload some of their material for the model to use as guidance and reference. Users will get the option to either precisely input their comprehensive formatting guidelines, or answer a quick startup guide if they prefer. The startup guide caters to new businesses, or existing businesses looking for a rebranding. It will efficiently gather formatting preferences from the user and generate guidelines accordingly. Note that while users can only access this menu once, they can access the format guidelines and the startup guide again through the Settings Menu at any time in the future. IntelliGen users can also manage which platforms they will crosspost to and use the chatbot on in this menu.

Content Creation Interface

Users will also interact with the core function of the IntelliGen system in this menu which provides a medium for translating content-creation related requests between the user into API calls specific to the GPT system of the AI. As previously stated, IntelliGen will either generate content autonomously through a replication process based on analysis of previous inputs or via direct instructions from prompts which can include text, files, and images. After the users receive their generated content, they can approve the content and post it immediately or schedule periodic posts of their content to their desired platforms.

Settings Menu

IntelliGen users can manage which platforms they will crosspost to and use the chatbot on in this menu. Users will also access all other relevant options not included in other menus in the settings menu. As previously stated, this includes modifying parameters selected during the initial setup.

Data Analytics Menu

Users will access the engagement and outreach data of their audiences in the data analytics menu in both aggregate form and on a per-platform basis as well. The data made available by platform APIs does limit the implementation of the data analytics menu, but the menu aims to centralize the analysis in one place for user convenience.

5.2.2 Secondary UI - Third-Party Social Media App-Integrated Chatbot

The chatbot integrates directly into social media platforms, with the ability to change initial setup options such as brand, formatting and tone attributes as well as create and modify content. As the development team collects data on the most frequently used features, updates to the application will enable them to interact with more of the IntelliGen software through the chatbot medium. Initially, the IntelliGen chatbot will be available to interact with as a business account on LinkedIn, Facebook, Instagram and X/Twitter. By sending a private message to this account, users can log in with their IntelliGen credentials and instruct the bot to create content and make changes to their settings directly within the messaging feature of the social platform.

5.3 Hardware Interfaces

As a web app, IntelliGen will run on the browser version supported by the native browser application of the following mobile and PC devices.

- Devices capable of running Android 5 or newer
- Devices capable of running iOS 11 or newer
- Devices capable of running Windows 7 or newer
- Devices capable of running MacOS 10.9 or newer
- Devices capable of running Ubuntu 16.04 or newer

Given the use across mobile and PC devices the web app will support touchscreen interaction and traditional mouse and keyboard usability.

5.4 Software Interfaces

Given the nature of the product, IntelliGen will support connections between various GPTs and social platforms. However, the application will strictly share only the minimum needed information to perform the content generation. Once shared, this data is subject to the storage terms and conditions of these other platforms. On the IntelliGen side, the system will retain data according to the user's course of action as described in UC-4-2 and UC-4-3.

OpenAI

While the development team will design IntelliGen to pair with any established AI, for the initial release, all large language model operations will use API calls for OpenAI. Therefore, our software will constantly communicate with Open AI's servers. This limitation makes the functionality of IntelliGen heavily dependent on the state of OpenAI's technology. However, in later releases, the development team will roll out compatibility for other AIs such as Google's DeepMind.

Social Media Platforms: LinkedIn, Facebook, Instagram and X/Twitter

The data flowing from IntelliGen into social media platforms will consist only of API triggers to post content on the user's account as well as text and visual input for use by the chatbot. On the receiving end, IntelliGen will collect two types of outgoing data from these platforms, data from each platform's business analytics regarding engagement from the community and user input given to the chatbot to execute the desired commands.

5.5 Communications Interfaces

The development team plans on using Python to handle all API communications. Specifically, the team will use version 2.32.3 of Python's Requests library [1]. In future, should plans evolve, IntelliGen may require using additional public or private libraries to handle further API communications.

OpenAI:

For the launch version of IntelliGen using OpenAI [2], the APIs will always respond in JSON format, with the text output inside the choices field. The 3 most relevant parameters will consist of temperature to control the variance in the output Max tokens to enforce limits in the output's length and Role messages to control the context around the text generation. The system will also require a robust error-handling system for cases when the API call fails.

Facebook & Instagram, Graph API:

While there exist some minor differences, both Facebook and Instagram use very similar APIs [3]. Therefore, using Graph [4], IntelliGen can retrieve all the community engagement data and manage user pages.

LinkedIn, REST API:

Similarly, IntelliGen can create posts and collect relevant data using the REST API [5].

X, Twitter API V2:

This API unique for X, formerly known as Twitter, offers the same functionalities as the APIs above but requires its API call implementation [6].

6 Other Non Functional Requirements

This section describes non-functional requirements for the IntelliGen system that have not been previously covered.

6.1 Performance Requirements

The performance requirements for this application are as follows:

Content Generation Timing:

Per the client specified constraints, the application must generate text and images within 1 minute and video content within 5 minutes.

Scalability:

As the user base grows, the application must handle thousands of users generating content and interacting with the system simultaneously. IntelliGen must maintain its performance during periods of high site traffic by dynamically allocating resources such as memory and input/output devices [7].

6.2 Safety Requirements

The IntelliGen software will include the following safety measures:

Data Backups:

IntelliGen will regularly back up user data in the case of any data loss due to system failures or cyber-attacks. The system will perform a backup every 24 hours to ensure the data remains up-to-date and securely stored [8].

Safeguards:

The IntelliGen software will include safeguards that will flag any content that may cause harm or offend users. The flagged content will require human review by the IntelliGen user before publishing to prevent damage to a client's reputation [8].

GDPR Compliance:

As per the RFP, IntelliGen will comply with GDPR regulations and follow all protocols for handling personal data, user consent, and data retention policies [8].

6.3 Security Requirements

The following security requirements will apply to the IntelliGen application:

Access Control:

IntelliGen will restrict all users to private profiles. Therefore, all profiles will exist in isolation from other users. This separation ensures that all user and campaign information remains confidential. The IntelliGen software will regulate the access control by managing user roles, access permissions, and secure storage [9].

Encryption:

The IntelliGen software will encrypt all user data and campaign information at rest and in transit using Advanced Encryption Standard (AES -256). Furthermore, secure servers will ensure proper management and storage of the encryption keys for the user data [9].

Authentication:

The IntelliGen application will use multi-factor authentication to verify users accessing and logging in to their profiles. Properly verifying the user in this way provides another layer of protection that secures their confidential data [9].

6.4 Software Quality Attributes

The following describes the software quality attributes of the IntelliGen application:

User-friendly UI:

IntelliGen will have an intuitive user-friendly interface. The simplicity will make the app accessible for all users while leaving the higher user level classes the ability to option the app for more complex technical use.

Reliability:

IntelliGen will have an uptime availability of 99.9%. Users will have access to the application at all times except during periods of scheduled maintenance [10].

Maintainability:

IntelliGen will run on easily modifiable code so that the application can adapt to new changes and update periodically according to the needs of users. The development team will focus extensively on properly structuring and documenting the code which will enable them to make changes efficiently to meet the evolving needs of clients.

7 Data Flow Diagrams

This section demonstrates the data flow in and out of the IntelliGen system. The data flows between the system, additional system, users, and actors that it interacts with.

7.1 Context Flow Diagram

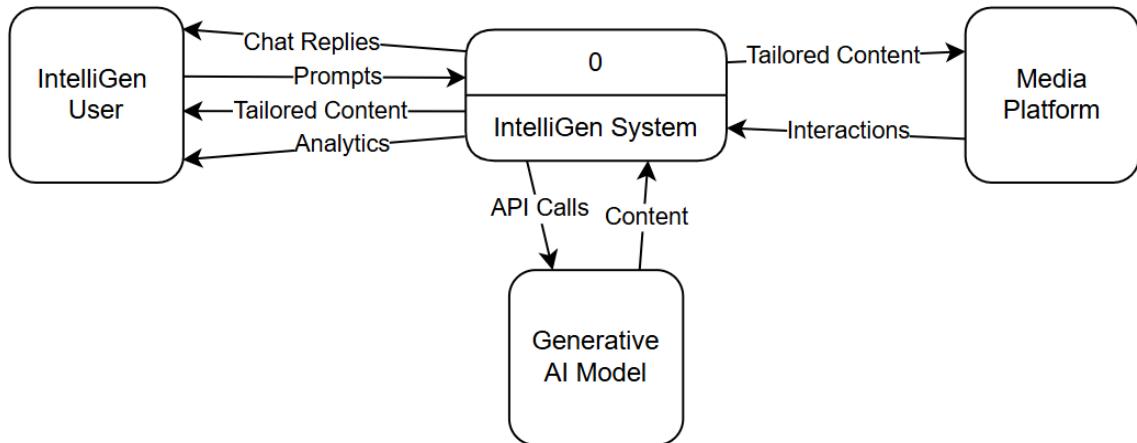


Figure 7.1.1 Content flow diagram for the IntelliGen system

7.2 Level 1 DFD

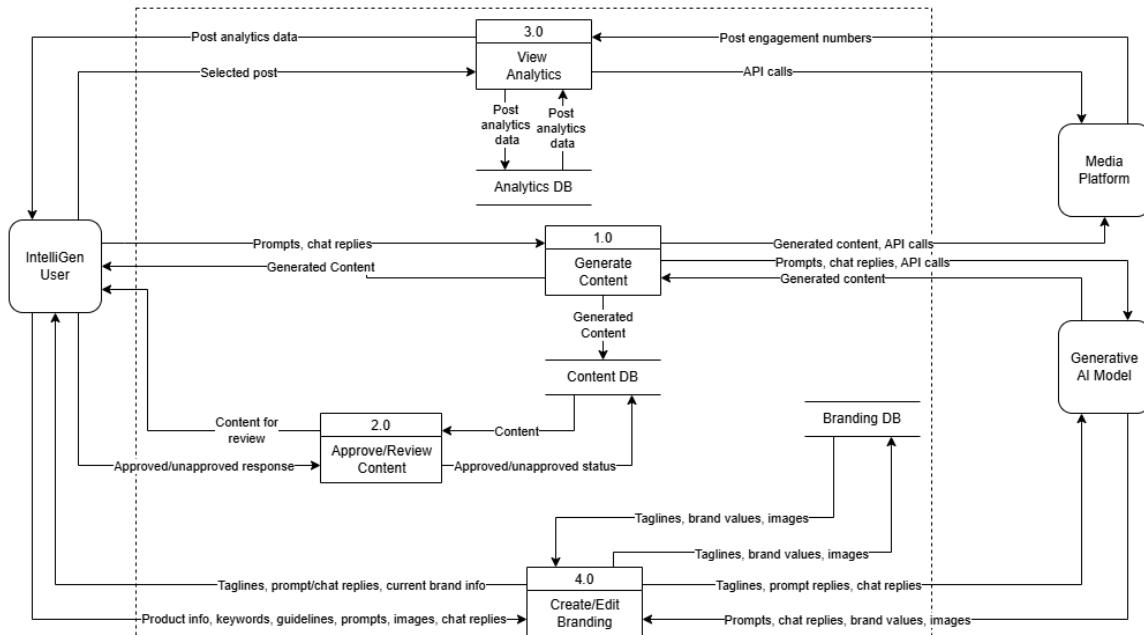


Figure 7.2.1 Level 1 data flow diagram for the IntelliGen system

7.3 Level 2 DFD

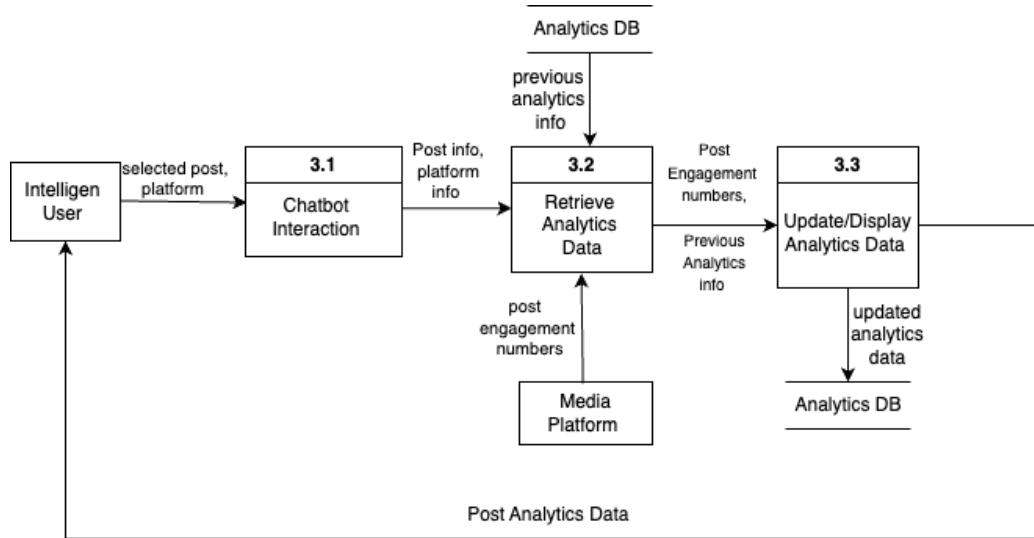


Figure 7.3.1 Level 2 data flow diagram highlighting the “View Analytics” process

8 Entity Relationship Diagrams

This section includes the entity relationship diagram and data dictionary relevant to the IntelliGen system.

8.1 Entity Relationship Diagram

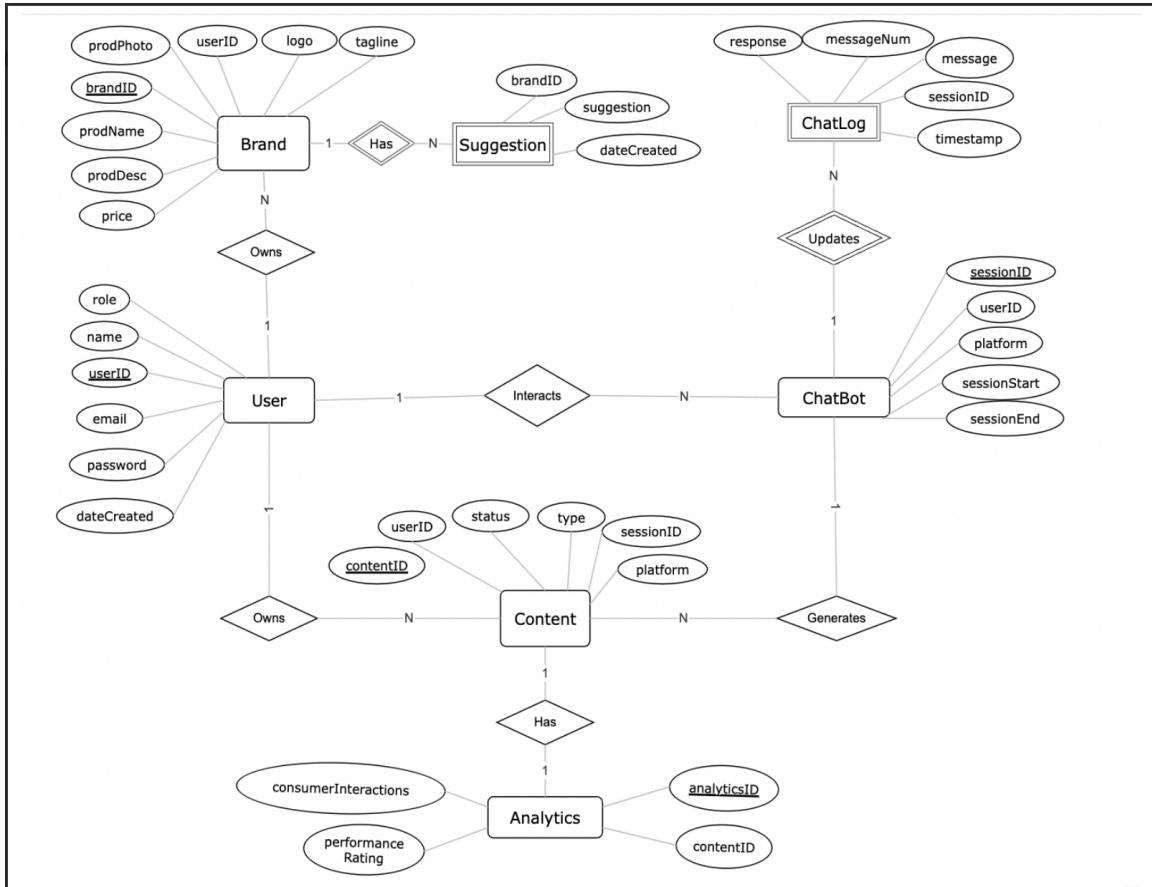


Figure 8.1.1 Entity relationship diagram for the IntelliGen system and its interactions

8.2 Data Dictionary

Table 8.2.1 Data dictionary diagram

Object Class	Attributes	Key
User	userID email password role dateCreated	PR
ChatBot	sessionID userID Platform sessionStart sessionEnd	PR FR
ChatLog (Weak)	sessionID	FR

	messageNum		
	message		
	response		
	timestamp		
Content	contentID	PR	
	userID	FR	
	platform		
	type		
	content		
Analytics	analyticsID	PR	
	contentID	FR	
	consumerInteractions		
	performanceRating		
Brand	brandID	PR	
	userID	FR	
	prodName		
	price		
	description		
	prodPhoto		
	keyword		
	tagline		
	logo		
Suggestion (Weak)	brandID	FR	
	suggestion		
	dateCreated		

Table 8.2.2 Primary key table

Primary Keys	
Entity	Primary Key
User	userID
ChatBot	sessionID
Content	contentID
Analytics	analyticsID
Brand	brandID

Table 8.2.3 Foreign key table

Foreign Keys		
Entity	Foreign Key	References
ChatBot	userID	User
ChatLog	sessionID	ChatBot
Content	userID	User
Content	sessionID	ChatBot
Analytics	contentID	Content
Brand	userID	User
Suggestion	brandID	Brand

9 Prototype User Interface

This section provides mockups and user stories as models for the implementation of IntelliGen.

9.1 Mockups

The following sections depict mockup pages for the IntelliGen application.

9.1.1 Login Page



Figure 9.1.1.1 Login page mockup

9.1.2 Create Account Page



Figure 9.1.2.1 Account creation page mockup

9.1.3 Homepage

The image shows a mockup of the IntelliGen homepage. At the top, there is a dark blue header bar with the IntelliGen logo, the date '2024-11-08', and the OmniWorks logo. Below the header, a large yellow box contains several sections: 'Create Branding' (with a diagram of corporate identity components like communication, logo, behavior, culture, vision, and mission), 'Marketing Strategy' (with a diagram of the 4Ps: Planning, Price, Placement, Promotion), 'Integrate our ChatBot for Marketing Improvements' (describing the AI chatbot's role in generating content across social media platforms), and 'View Analytics for Generated Content' (describing trend analytics that compile performance data from various social media platforms). At the bottom left, there is an 'About Us' section with a brief description of the tool's purpose.

Welcome to IntelliGen! Get Started

CORPORATE IDENTITY

DESIGN, COMMUNICATION, LOGO, BEHAVIOR, CULTURE, VISION, MISSION, LANGUAGE

MARKETING STRATEGY

PRICE, PRODUCT/ SERVICE, PERFORMANCE

PLANNING, PLACEMENT, PROMOTION

Create Branding

Brand creation gives users the ability to generate branding for their businesses by uploading and saving information about their products/services.

Integrate our ChatBot for Marketing Improvements

The IntelliGen AI chatbot helps users through the native messaging interface of each social media site. The chatbot will facilitate the generation and modification of user content.

View Analytics for Generated Content

Trend analytics compiles all of the analytics gathered from the social media platforms where the content is being posted. The feature formats the information to indicate the overall performance of each social media platform.

About Us

We developed an AI-powered content generation tool that automates the creation of digital marketing content specifically for social media platforms (Facebook, Instagram, Pinterest), blogs for LinkedIn, and personalized email marketing. The tool generates content that is consistent with your brand's voice, tailored to the specific requirements of each platform, and personalized for different audience segments.

Figure 9.1.3.1 IntelliGen homepage mockup

9.1.4 Account Setup Page

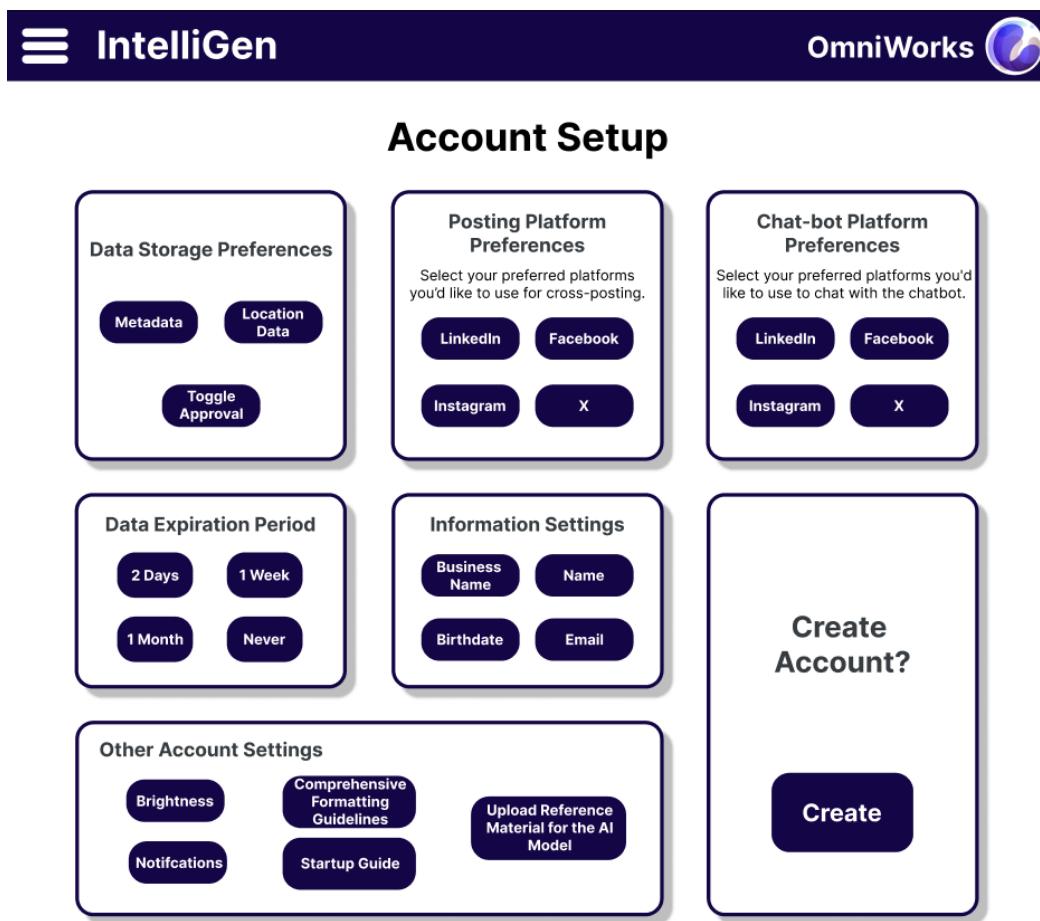


Figure 9.1.4.1 Account setup page mockup

9.1.5 Account Settings Page

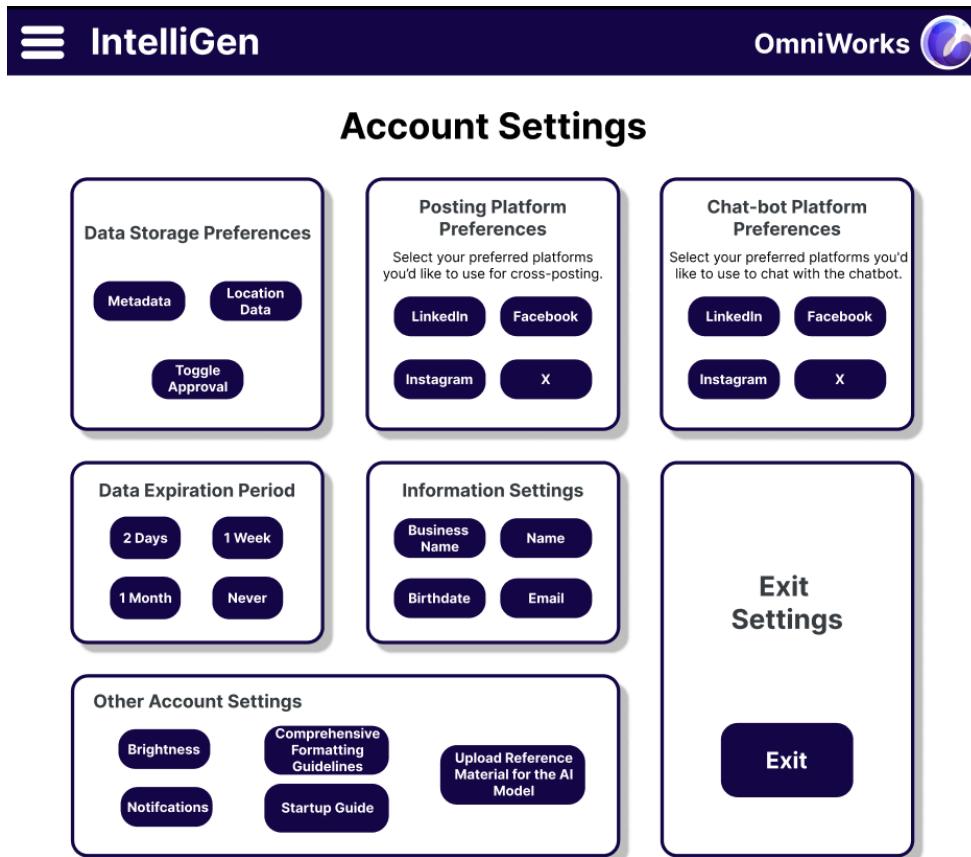
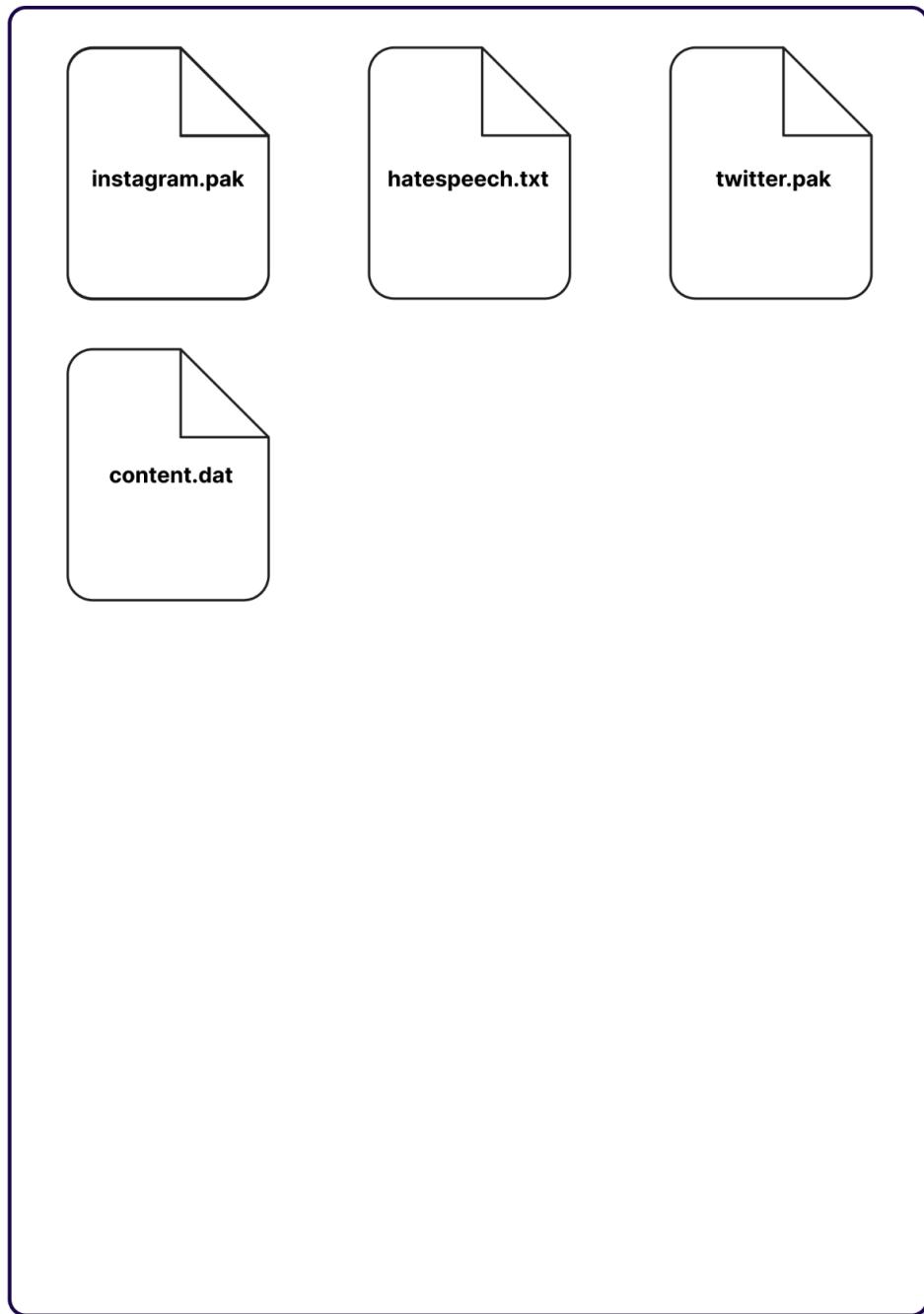


Figure 9.1.5.1 Account settings page mockup

9.1.6 Content Data Folder



Content Data Folder



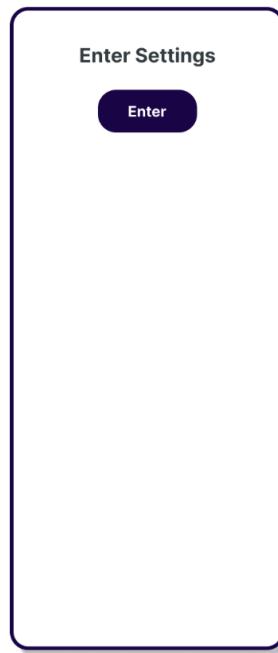
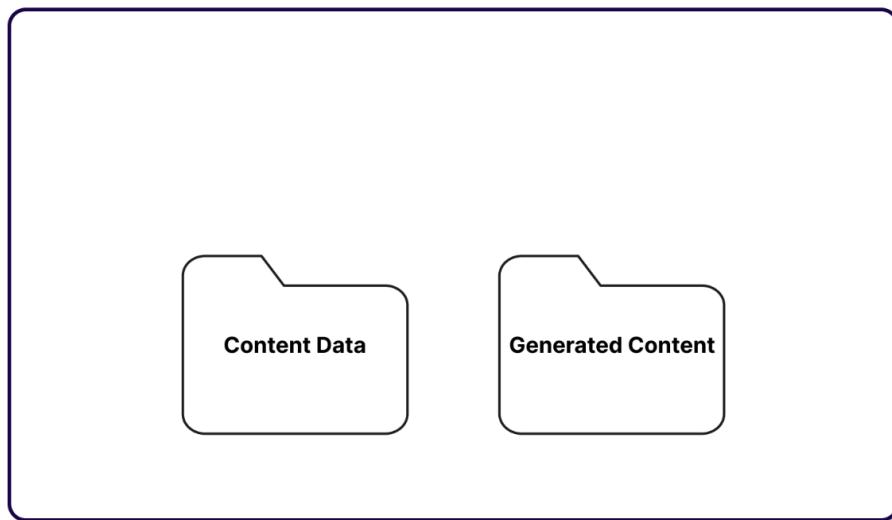
Data will be deleted in 1 week

Figure 9.1.6.1 Content data folder page mockup

9.1.7 Content Approval Tab



Content Approval Tab



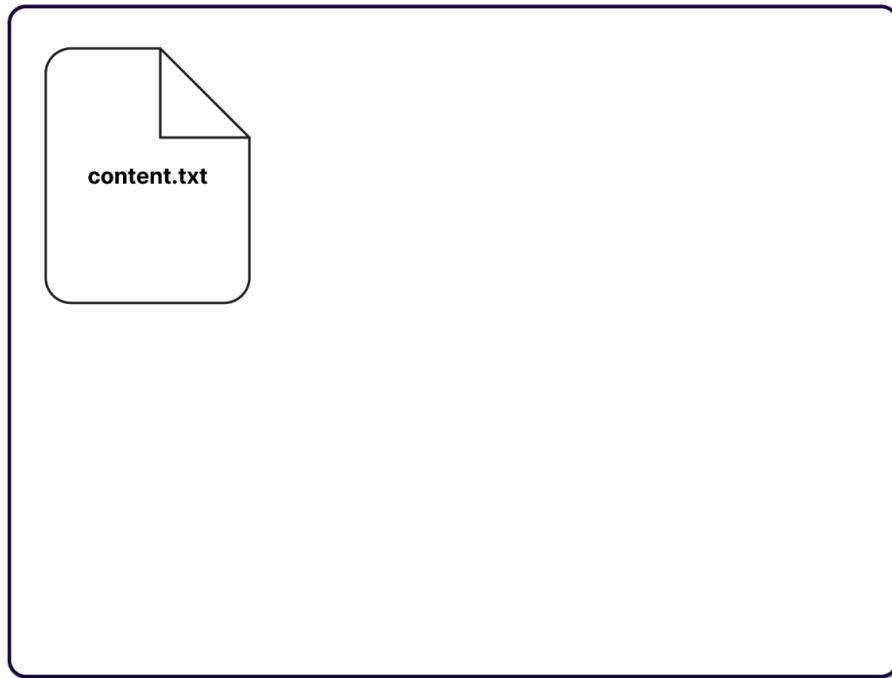
Content is not currently generating

Figure 9.1.7.1 Content approval page mockup

9.1.8 Generated Content Folder



Generated Content Folder



Content is not currently generating

Figure 9.1.8.1 Generated content folder mockup

9.1.9 Trends and Analytics Page

The mockup displays the 'Trends and Analytics' page with the following sections:

- Native Analytics** Quickly access and review native analytics from each of your social media platforms. Stay informed with the familiar metrics you're used to, seamlessly aggregated into one interface.
- Content Performance Breakdown** Dive deep into your content's performance! Get insights into the strong and weak points of your posts to optimize your social media strategy.
- Critical Consumer Interactions**  Identify and respond to your audience effectively. Highlight critical consumer interactions, both positive and negative, to maximize engagement and mitigate risks.
- Self Iteration Insights**  Discover how IntelliGen is evolving with your usage. View detailed reports on system self-iterations and changes in content generation behavior for continuous improvement.

Figure 9.1.9.1 Trends and analytics page mockup

9.1.10 Brand Creation

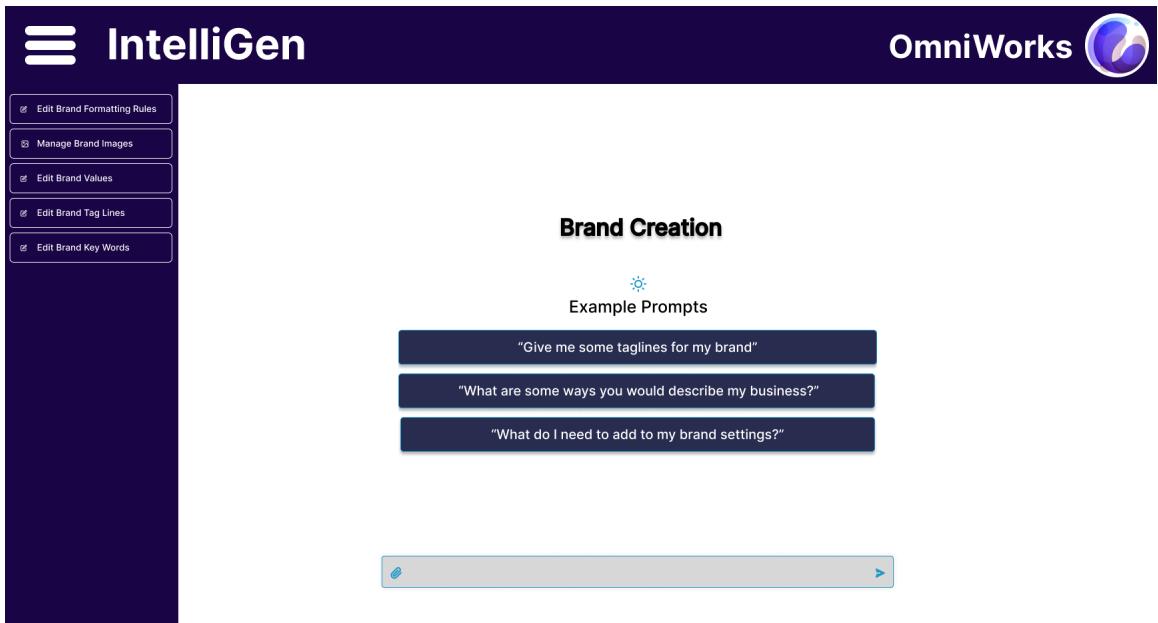


Figure 9.1.10.1 Brand creation page mockup

9.1.11 Content Generation

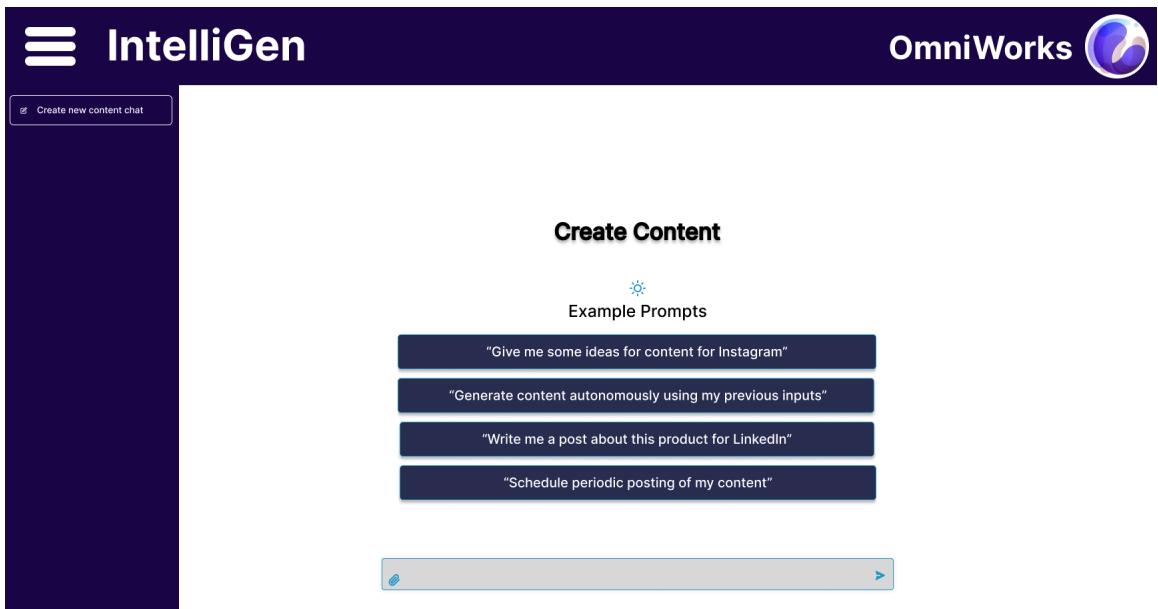


Figure 9.1.11.1 Content generation page mockup

9.2 Storyboards

The following sections depict storyboards and user stories for the IntelliGen application. The most recent prototype update now has larger font alongside higher contrasting popups and text for better user visibility [10]. These updates do not affect the flow of the storyboards. As a result, revising the storyboards is a low priority and is deferred to future requirements documents, as applicable.

9.2.1 Creating Account



Figure 9.2.1.1 Storyboard for user account creation

From the account creation page, the user enters a “Username” (1) and “Password” (2) then clicks “Create Account” (3) taking the user to the setup page. The user then has the option to change their account settings. For example, the user clicks “Metadata” (4) to modify that data storage preference. The user then clicks “Yes” (5) or “No” (6) and a popup (7) displays briefly that

confirms the user's preference. Scrolling down, the user can modify additional settings such as "Brightness" (8) or they click "Create" (9) which creates their account and sends them to the homepage.

9.2.2 Login

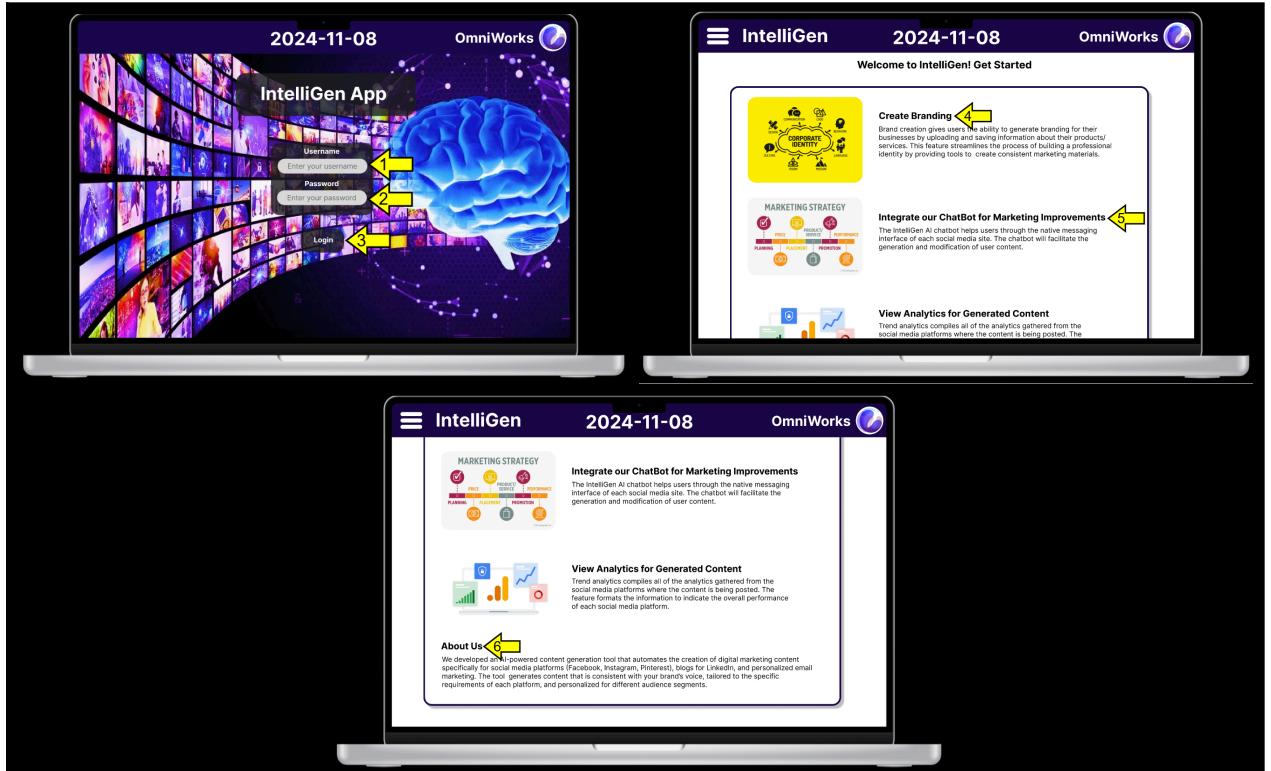
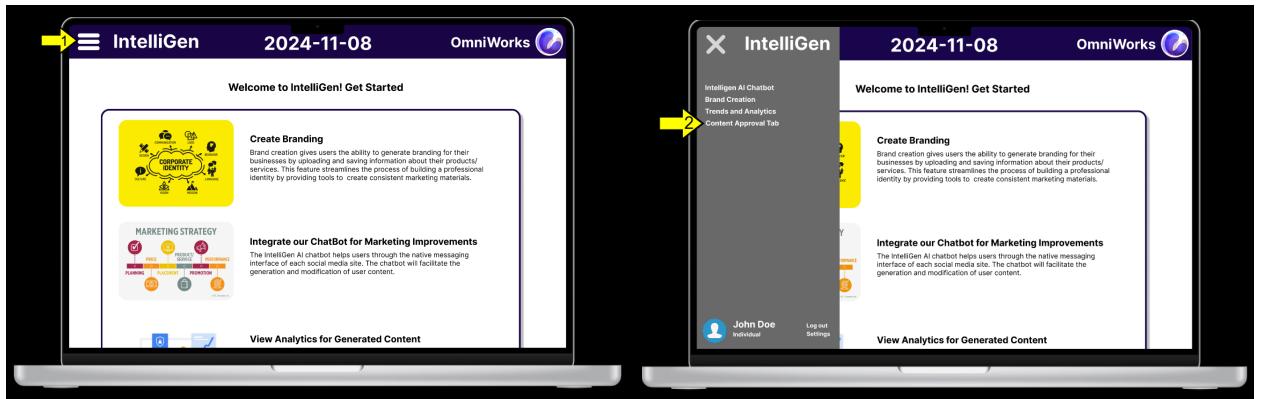
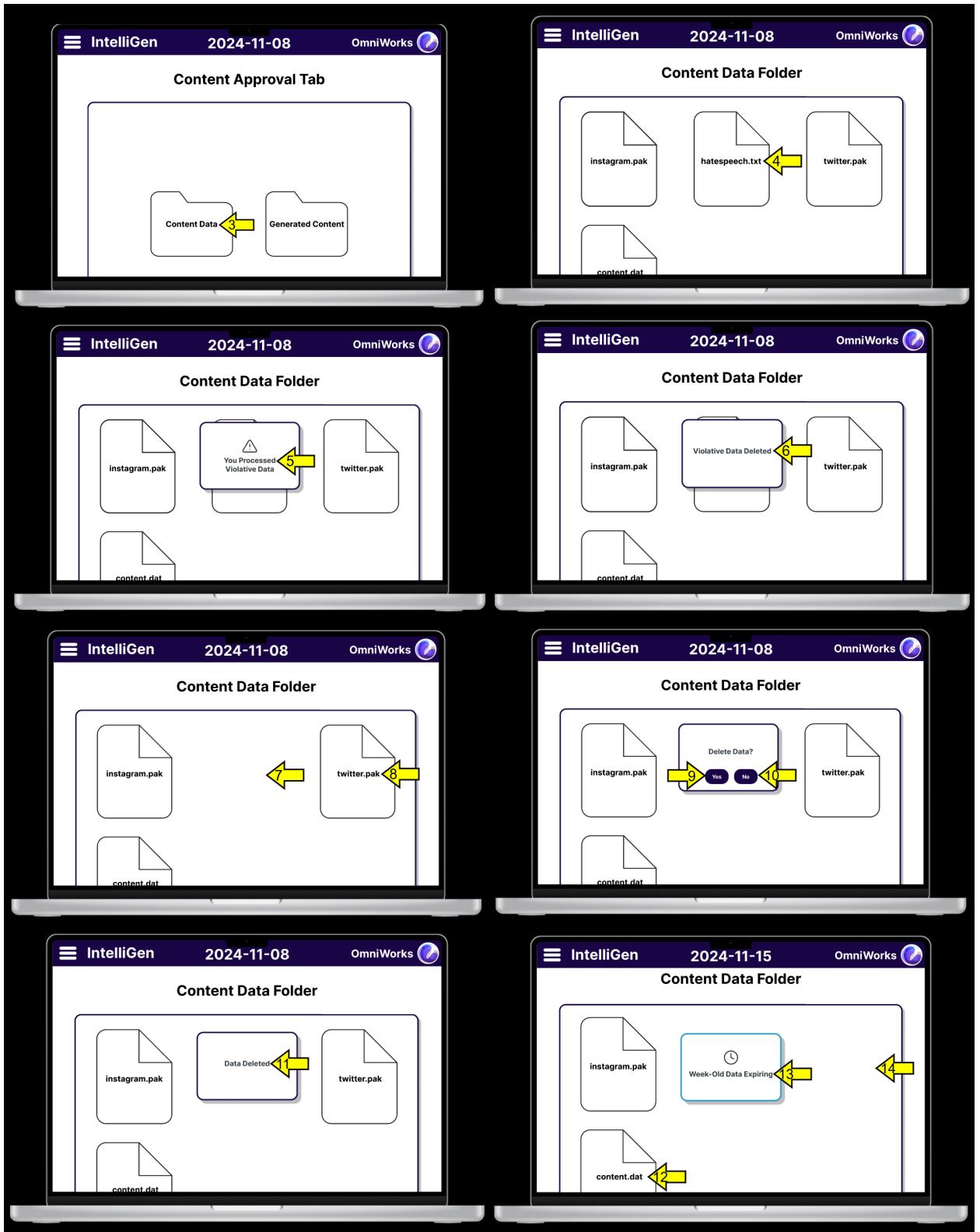


Figure 9.2.2.1 Storyboard for user login

The user enters their "Username" (1), "Password" (2) and clicks "Login" (3) which takes them to the homepage. On the homepage, the user sees info about creating branding (4) and chatbot integration (5). Scrolling down to the very bottom of the homepage, the user reads the information section "About Us" (6).

9.2.3 Deleting Data by Violation, Selection and Expiration





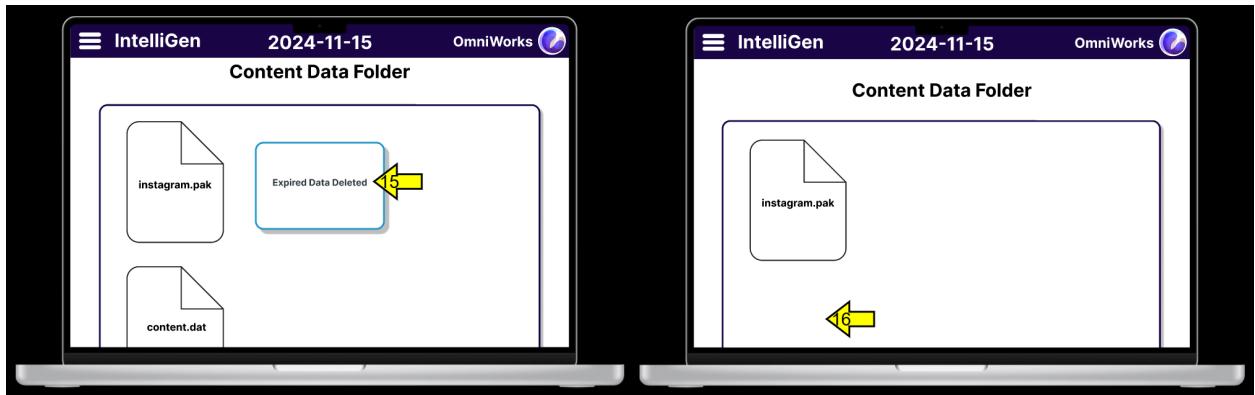
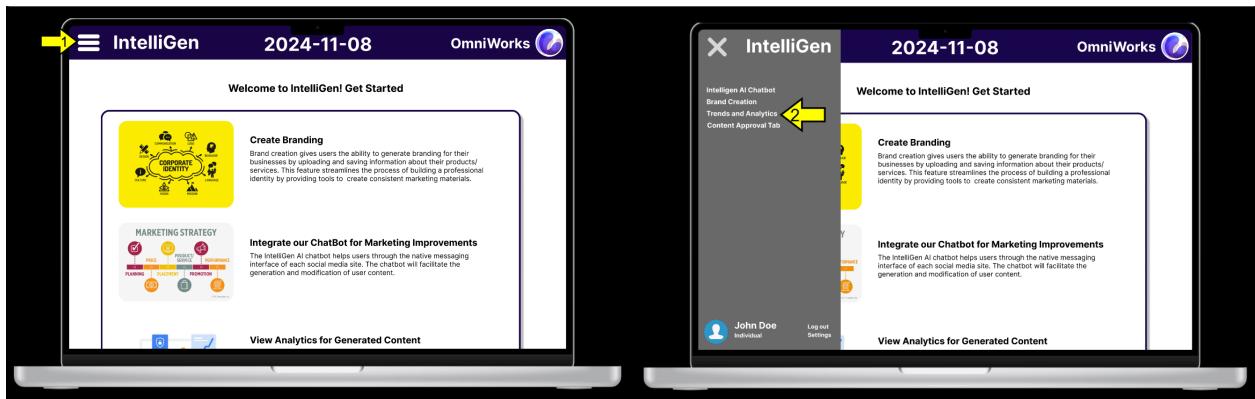


Figure 9.2.3.1 Storyboard for deleting data by violation, selection, and expiration

From the homepage the user clicks the hamburger menu (1) which opens the IntelliGen sidebar. On the sidebar they click “Content Approval Tab” (2) to go to that tab. Then they click the folder “Content Data” (3). In that folder, the user has the violative data, “hatespeech.txt” (4). The system notifies the user of the violative data in a temporary popup (5). Then, the system confirms the deletion of this violative data in another temporary popup (6) and the user soon sees that the violative file is deleted (7). Next the user clicks “twitter.pak” (8) to selectively delete that data. The user can then click “Yes” (9) to confirm the deletion or “No” (10) to cancel the deletion. If the user clicks “No” (10), the data does not get deleted. Elsewise, if the user clicks “Yes” (9), the user sees a temporary popup(11) confirming the delete action and the user soon sees that the file is gone (14). Assuming that “content.dat” (12) is an old file, the user sees a temporary popup (13) informing the user that data is expiring. The user soon sees another temporary popup (15) confirming the deletion of the expired data and then they see the expired data is deleted (16).

9.2.4 Check Trends and Analytics



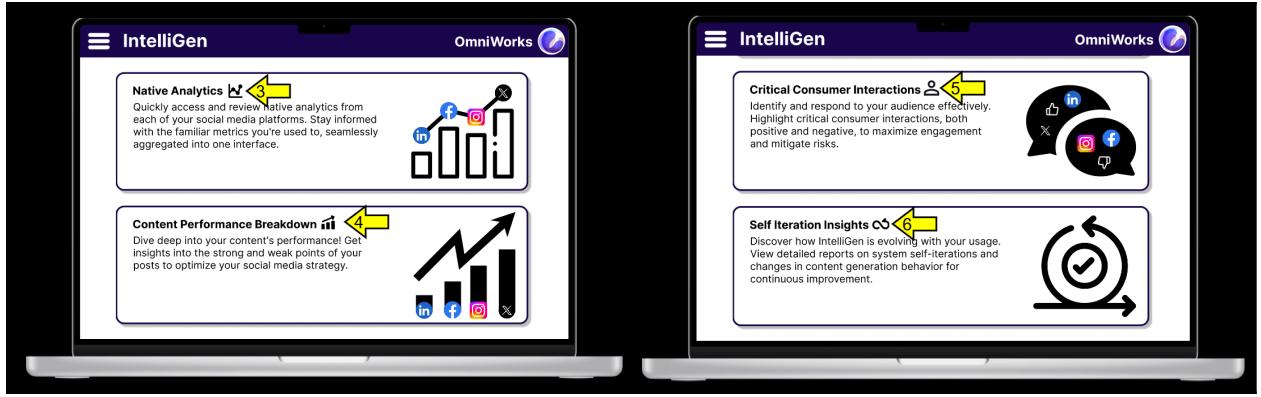
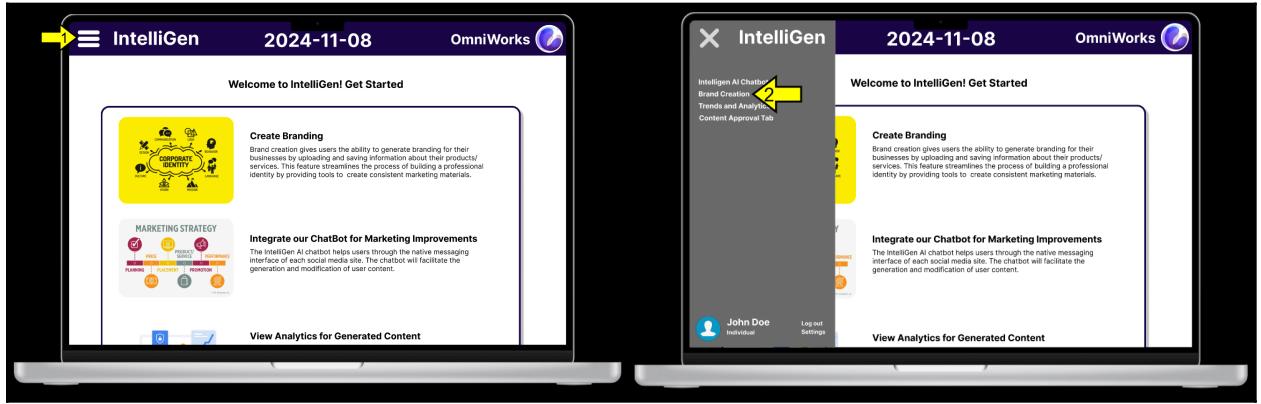


Figure 9.2.4.1 Storyboard for checking content trends and analytics

From the homepage the user clicks the hamburger menu (1) which opens the IntelliGen sidebar. On the sidebar they click “Trends and Analytics” (2). Next, scrolling down, the user clicks “Native Analytics” (3), “Content Performance Breakdown” (4), “Critical Consumer Interactions” (5) or “Self Iteration Insights” (6) to open a page providing more detail as the user desires.

9.2.5 Create Brand



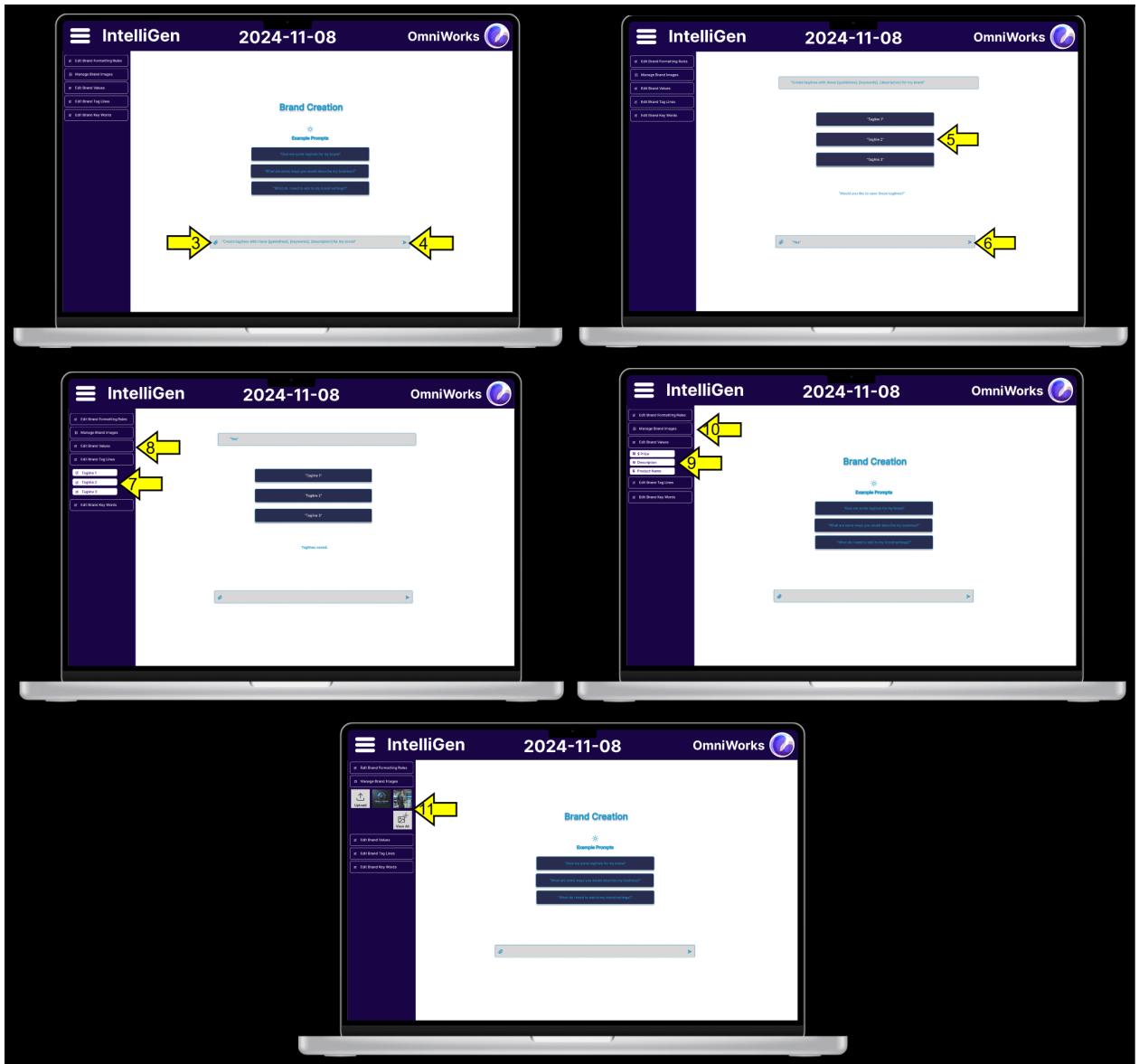


Figure 9.2.5.1 Storyboard for brand creation

From the homepage the user clicks the hamburger menu (1) which opens the IntelliGen sidebar. On the sidebar, they click “Brand Creation” (2). Next, in the input field to the right of the paperclip icon (3), the user inputs their request of guidelines, keywords and/or description for their brand or clicks the paperclip (3) to submit their request as a file upload. Once the request is in, the user clicks the send icon (4). Next, the user sees the taglines (5) created for the brand and sends (6) a response to save the taglines. Then, the user sees the saved taglines on the left bar (7). Next, the user clicks “Edit Brand Values” (8) which shows some options (9) for their brand values. The user decides to next manage brand images (10) and they view the images (11) on the left bar to complete their brand creation process.

9.2.6 Creating Content

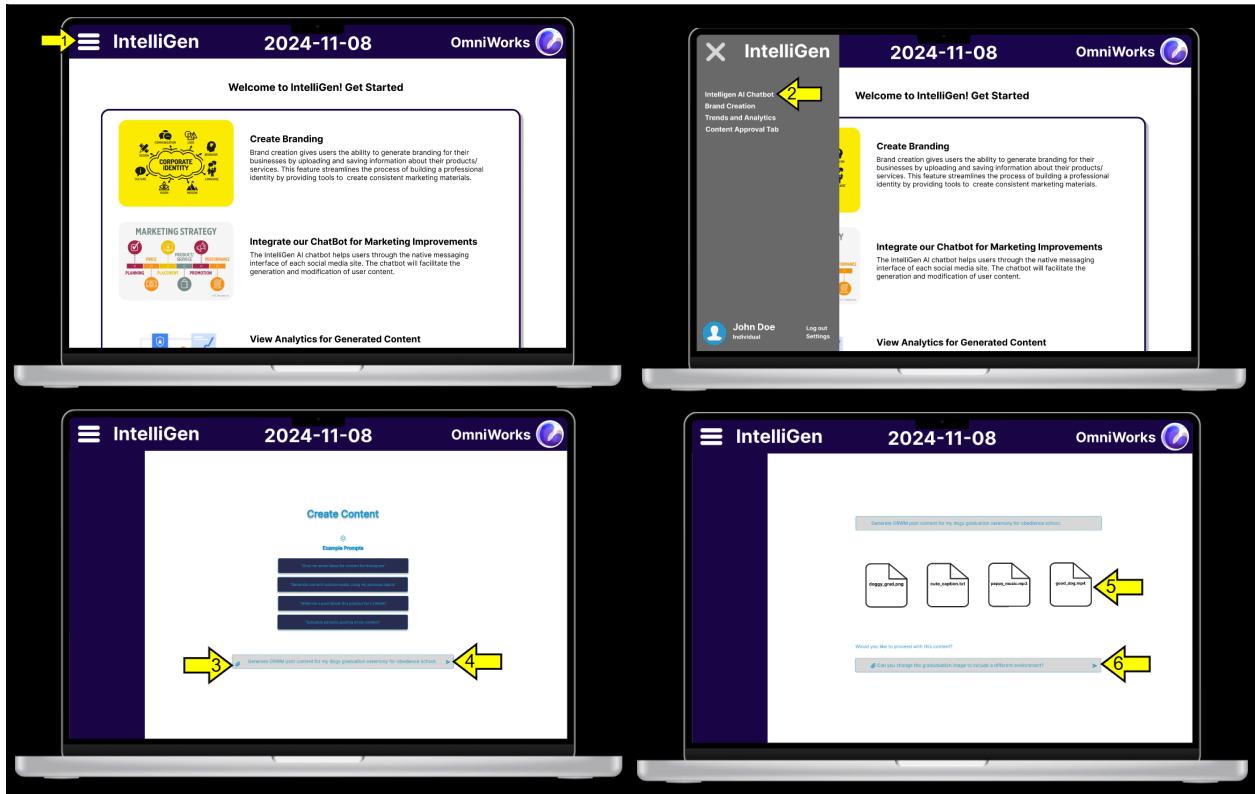


Figure 9.2.6.1 Storyboard for creating content

From the homepage the user clicks the hamburger menu (1) which opens the IntelliGen sidebar. On the sidebar, they click “Intelligen AI Chatbot” (2) which takes them to content creation. In content creation, to the right of the paperclip icon (3), the user can enter a text prompt in the input field or click the paperclip to upload a file as a prompt. Once the prompt is in, the user clicks the send icon (4) and then sees their generated content (5). The user can then send (6) further prompts according to their impression of the generated content.

9.2.7 Approving Content



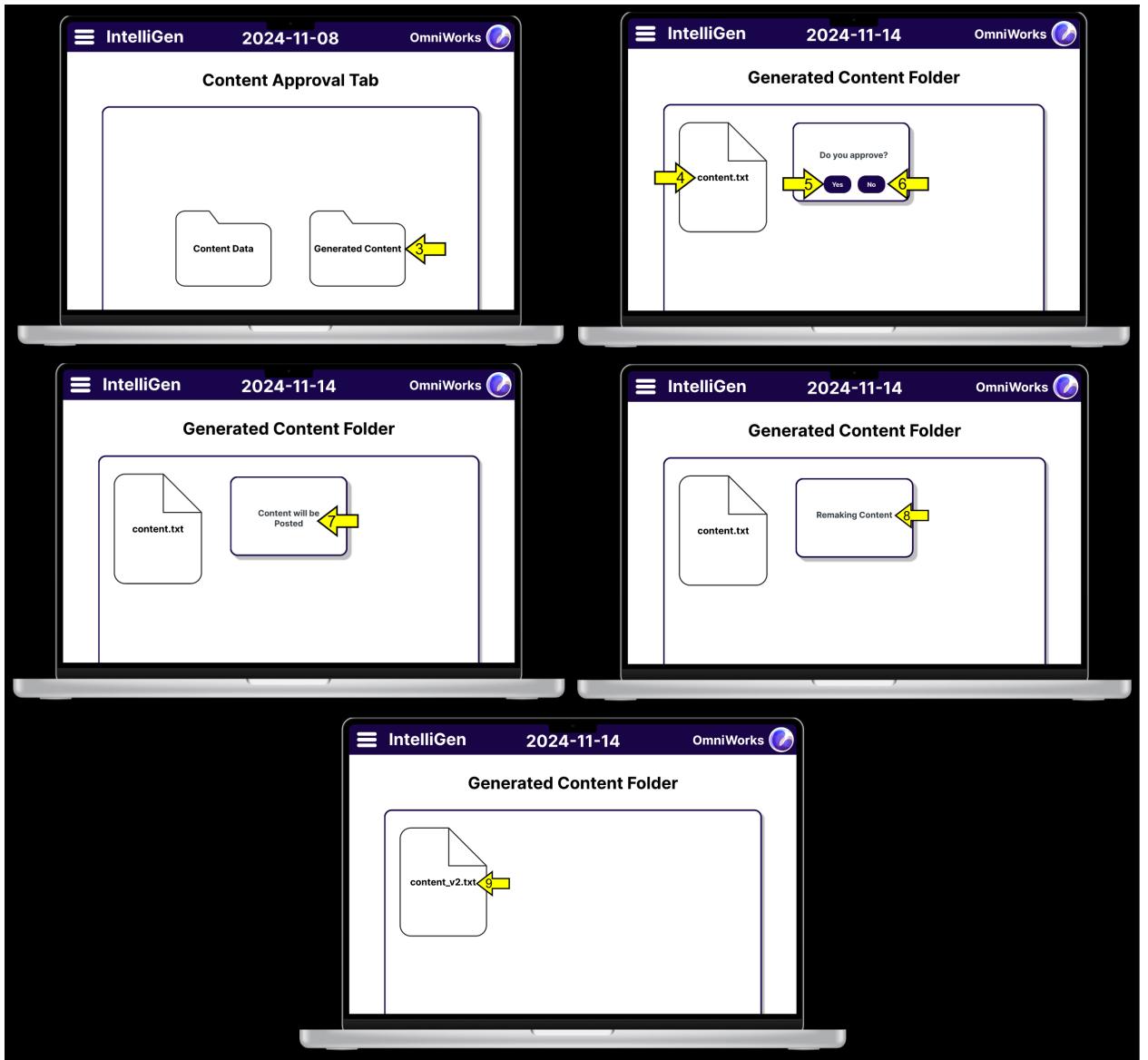


Figure 9.2.7.1 Storyboard for approving generated content

From the homepage the user clicks the hamburger menu (1) which opens the IntelliGen sidebar. On the sidebar they click “Content Approval Tab” (2) to go to that tab. Then they click the folder “Generated Content” (3) to go to that folder. In that folder, the user clicks “content.txt” (4) and then the user clicks either “Yes” (5) to approve the content or “No” (6) to reject the content. If the user approves the content, they get a temporary popup (7) confirming that the user approved that content for posting. If the user rejects the content, they see a temporary popup (8) indicating a content remake. The user then sees the result of the content remake, “content_v2.txt” (9). The user can then approve or reject “content_v2.txt” (9) as well, just as they did with the original file.

9.2.8 Modifying Account Settings and Exiting to Homepage



Figure 9.2.8.1 Storyboard for modifying account settings and exiting to homepage

From the homepage the user clicks the hamburger menu (1) which opens the IntelliGen sidebar. On the sidebar they click “Settings” (2). In settings the user clicks “Metadata” (3), for example, to modify that data storage preference. The user then clicks “Yes” (4) or “No” (5) and a popup (6) displays briefly that confirms the user's preference. Scrolling down, the user can modify additional settings such as “Brightness” (7) or they click “Exit” (8) which returns them to the homepage.

10 Other Requirements

At this time, the IntelliGen development team does not recognize any additional requirements regarding the project.

11 Appendix: Issues List

Current open requirements

1. Length of retention period for conversation history with chatbot TBD
2. Performance threshold TBD
3. Minimum number of user interactions required for proper trends and analytics to properly function TBD
4. Auto posting configuration is included in “Toggle Approval” setting, this may not be ideal