



March 27 2026
Morgan Nicholson, Faculty Mentor
Kyle Montgomery, Sponsor and Founder & CEO, Generous, Inc.
Zazel Turner
Christofer Vega
Josselin Retiguin Gutierrez

Requirements Specification

Team: Generous, The Joy of Giving Project

Accepted as a baseline requirement for the project.

For Team: _____

For Client: _____

Versión 1.2 - updated 4/17/2026

Table of contents

1. Introduction
2. Problem Statement
3. Solution Vision
4. Project Requirements
5. Performance Requirements
6. Environmental Requirements
7. Potential Risks
8. Project Plan
9. Conclusion

1. Introduction:

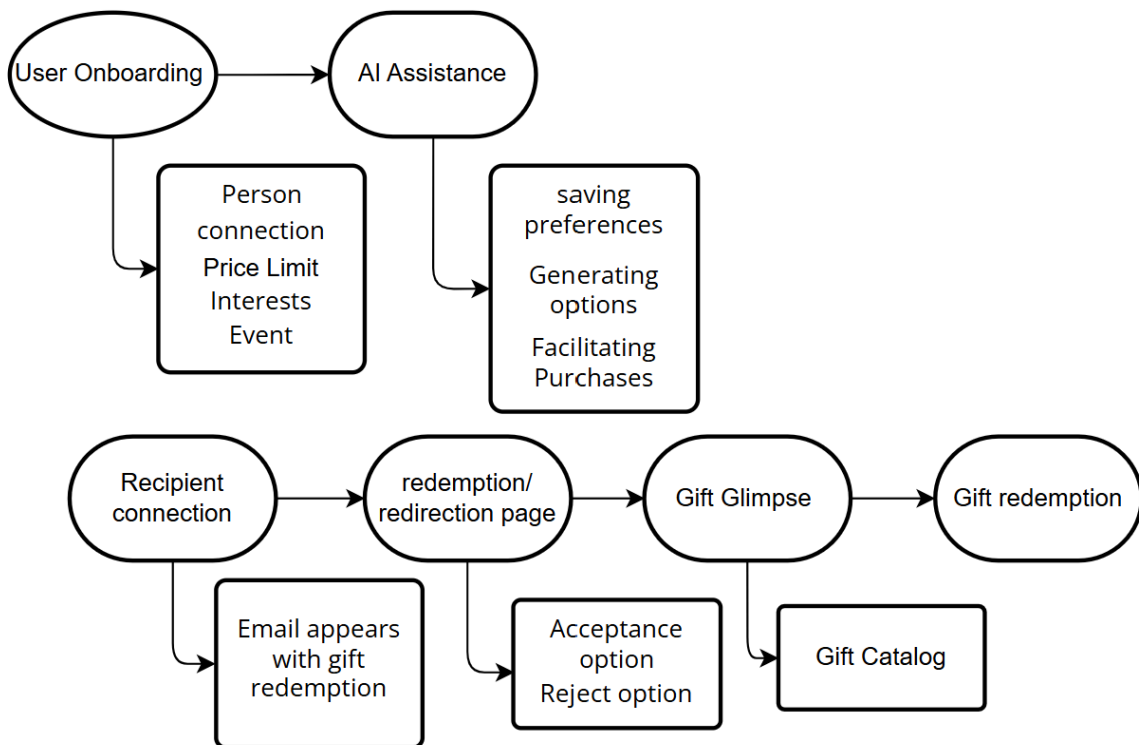
The gifting experience is one of the major sections of e-commerce that brings in billions of dollars in annual revenue spanning across holidays, birthdays, celebrations and even personal milestones. According to Business Research Insights (2026), “Global Gifting Market size was valued at USD 51.29 Billion in 2025, expected to reach USD 60.05 Billion by 2035”. As the shopping and gifting industries continue to shift to online platforms, users continue to expect experiences that not only provide convenience but are also offered but are also visually exciting and personalized. Through the demand it still proves difficult to provide an experience that feels intuitive, exciting and personalized.

Generous is developing with this rapidly growing space as a solution to the challenge of providing a meaningful gifting experience with ease and comfort. This platform is one that combines all the needs from the beginning to the end of the gifting process. including calendar notifications, intuitive gift suggestions, facilitated gift purchases and even allows the recipient to access what's called a Gift Glimpse where they can browse and select a different gift. This document will overview the recipient side experience and outlines how we aim to build on and improve the UI to better support that journey.

Generous is founded and led by Kyle Montgomery who serves as the sponsor and an active developer on the project. This company is the one stop shop for all the gifting needs, operating within the ever expanding digital gifting sector where convenience automation and personalization are becoming industry standards. Even though the platform has only recently entered a soft launch phase it already integrates with over 150 gift card brands through shopify which gives it immediate breadth despite its early stage. The company has two capstone development teams contributing to the system as well as him. It is currently being architected for long term scalability as the business grows.

Generous operates on a transaction-based revenue model where it earns a percentage from its gift card fulfillment partner. This amount is not directly visible to the end user. Future monetization can include premium subscription features but the current focus is on refining the core workflow. That workflow begins with the user onboarding, where the user can enter key details such as dates, relationships, price ranges and interest. They can then interact with the AI assistant to receive personalized gift recommendations and complete a gift purchase, on the recipient side the system sends an email containing the redemption link that then leads to a page where the recipient can accept or decline the gift. If they decline the gift they are routed to the Gift Glimpse interface where they can choose an alternative gift before the final redemption. A flowchart is included to visually map each user journey and highlight how each connects. This end-to-end workflow illustrates how generous aims to streamline the gifting for both senders and recipients.

The core workflow of Generous



This document outlines the requirements for enhancing the key interactions with the platform. It begins with a detailed problem statement followed by our solution vision that will guide the design and implementation decisions. We will then discuss in detail the requirements that define the scope of this project. Following will be any potential risks and the plan to ensure that we are successful in these implementations. Together these sections align a clear foundation for delivering an intuitive, visually connecting, and scalable gifting experience specifically for the recipients.

2. Problem statement

The recipient workflow depends on the visual representations of the gift options as well as the interactive experience that enhances the ease of use. To understand where the breakdowns occur it has helped to perform UX experiments that show how the platform operates and what is missing. What we found was that the Gift Glimpse platform felt static and offered no guidance or real help choosing the users gift. If the recipient were to want to narrow down their options by choosing something more practical, locational, or catered towards their preferences the current search function would not support that. The search bar is limited in its filtering, and when there are no results they do not produce any alternatives or suggestions. As a result the recipient experience often feels overwhelming and disconnected from the intent behind the gift. We also found that the current structure does not elicit excitement for the product. When the recipient is browsing categories or clicks on a product

the it displays minimal imagery and a auto populated description from the external product used to host these giftcards.

These limitations have become more apparent when considering that the sponsor's long term goal is to make generous feel personal, useful, and emotionally engaging. At the high level the core problem is that the current system does not provide a visually compelling or intuitive guided recipient experience. These problems reduce engagement and make it difficult for users to confidently and comfortably choose a gift. The deficiencies we have identified are as follows:

Current Deficiencies:

- *Single image product cards* - limiting emotional impact
- *No dynamic update in gift glimpse* - making the experience feel static and disconnected
- *Lack of AI driven assistance* - leaving recipients with an overwhelming list to browse

These issues prevent Generous from being the smooth intuitive and emotionally resonant experience that users expect. In the next section we will outline how our proposed enhancements become a solution for these issues

3. Solution Vision:

Our proposed solution focuses on transforming the Gift Glimpse into a more intuitive and visually rich experience. The goal is to preserve the simplicity of the current rule based search system while introducing the new AI capabilities and visual additions to make it easier for recipients to browse gift options and confidently and excitedly select the one they want. The two major enhancements our solution focuses on are a redesign of a multi image gift card interface and an AI assistant that the recipients can engage with for more guidance.

The redesigned interface will present each gift card with multiple product images and updated styling that excites the recipient. Along with this the AI assistant will be available. This will help recipients browse the catalog and interpret natural language preference and respond with appropriate alternatives when asked. Together these enhancements create an interface that is more supportive to the recipient and is more emotionally engaging for them.

Key features of the solution:

- Multi-image gift card design: to increase emotional impact
- Consistent, high quality imagery: manually uploaded images for all 150+ gift card brands
- AI assistant: dynamically updated catalog system for ease of use
- Clickable gift card suggestions: displayed similar to the onboarding AI chat system
- Natural language understanding: enabling queries such as “do you have Amazon” or “I’m a sneakerhead”
- Fallback suggestions: fixing the blank page issues when there are no results

- Scalable UI components: support future enhancements

Data used by the system:

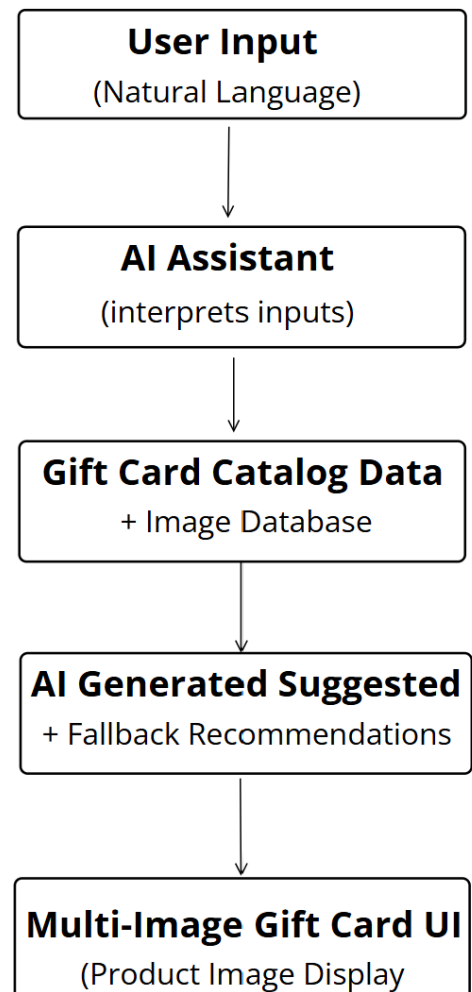
- Gift card catalog Data
- Manually uploaded images
- User input data
- AI- interpreted preferences

Data Generated by the system:

- AI generated gift suggestions
- Fallback recommendations

We investigated a few options for cataloging the product imagery. We initially went with the idea of using Cloudinary but found the cost to be high, so because of a previous conversation with the sponsor we decided on using google cloud to store the images. We believed we could handle the image cataloging however the system does not have any auto sizing so we will have to resize all the images to the same aspect ratio and compress them to a consistent size.

The plan for the AI system is to use Claude 3 Haiku as it is cost effective, has fast loading times great for real time UI updates, and supports tool calling. Because the sponsor uses claude for coding it will also keep our ecosystem consistent. We did discuss the use of GPT 4 and 5 because of its use in the onboarding process however GPT 4 and 5 are overpowered for the needs of the AI assistance in the Gift Glimpse page and Claude fits our needs better.



4. Functional Requirements

The following functional requirements demonstrate the expected system behavior for the Gift Glimpse feature within the Generous platform. These requirements are structured hierarchically starting with high-level system capabilities and leading into more detailed functional behaviors.

4.1 Gift Glimpse Interface

The system should provide an interface that allows recipients to browse and select gift card options

4.1.1 The system should provide recipients access to the Gift Glimpse interface through a secure link/button.

4.1.2 The system should display gift card recommendations immediately after loading the interface.

4.1.3 The system should allow users to browse available gift card options without navigation away from the interface.

4.1.4 The system should maintain a consistent layout across desktop and mobile devices.

4.1.5 The system should support a design for varying screen sizes

4.1.6 The system should ensure that users can interact with all features without any extra navigation steps.

4.2 Gift Recommendation display

The system should present gift card recommendations in a structured format and in a visually engaging format.

4.2.1 The system should display each recommendation as an individual card component.

4.2.2 The system should include a title and a description for each gift card

4.2.3 The system should display multiple gift card options.

4.2.4 The system should update the display recommendations based on the user interaction.

4.2.5 The system should update without requiring the user to refresh the page.

4.2.6 The system should ensure there is consistent formatting across all displayed gift cards.

4.3 AI natural language input

The system should allow users to interact with Generous using natural language.

4.3.1 The system should accept free form text queries.

4.3.2 The system should process specific queries (e.g. store requests) and general preference inputs.

4.3.3 The system should interpret incomplete inputs and attempt to generate relevant responses.

4.3.4 The system should maintain a continuous single interaction session for user inputs.

4.3.5 The system should allow users to refine or modify their inputs during their interaction.

4.4 AI recommendation generation

The system should generate personalized gift card recommendations based on user input.

4.4.1 The system should send user input to the AI service for processing.

4.4.2 The system should generate gift card recommendations based on its interpretation of the user intent.

4.4.3 The system should ensure the recommendations are relevant to the user's input.

4.4.4 The system should support recommendations that are either refined or modified.

4.4.5 The system should maintain the same context across multiple user interactions.

4.5 Dynamic interface update

The system should dynamically update the interface based on the AI outputs.

4.5.1 The system should update the gift card recommendations immediately after receiving AI responses.

4.5.2 The system should synchronize AI outputs with the product catalog data.

4.5.3 The system should ensure updates occur flawlessly without interruption to the user.

4.5.4 The system should ensure the interface is still responsive during the updates

4.6 Gift Glimpse Image Management

4.6.1 The system should associate each gift card with an image.

4.6.2 The system should retrieve the image data from the storage or external services.

4.6.3 The system should ensure image data matches the correct product.

4.6.4 The system should support external image storage systems

4.7 Image display

The system should display images efficiently and responsively.

4.7.1 The system should display images alongside the gift card recommendation.

4.7.2 The system should optimize the image loading to reduce the latency.

4.7.3 The system should maintain a responsive image scaling for the device screen sizes

4.7.4 The system should minimize the impact in performance that will be caused from image loading.

4.7.5 The system should implement techniques for loading time where found appropriate

4.8 Search Functionality

The system should allow users to search and filter gift options.

4.8.1 The system should allow users to input search queries.

4.8.2 The system should filter the gift recommendations based on the search input.

4.8.3 The system should support keywords and preference based search.

4.9 No result handling

4.9.1 The system should provide alternative suggestions if a search result is not available.

4.9.2 The system should prevent empty result pages.

4.9.3 The system should suggest related categories for gift cards.

4.9.4 The system should maintain the user to engage even if their search fails.

4.10 User interaction flow

The system should support continuous and flexible user interaction.

4.10.1 The system should allow users to modify their input at any time.

4.10.2 The system should allow users to continue the interaction until a satisfactory result is found.

4.10.3 The system should maintain the same session state during the user interaction.

4.10.4 The system should preserve context across interactions.

4.11 Frontend-Backend communication

The system should support communication between client and server.

4.11.1 The system should send the user input to the backend through API requests.

4.11.2 The system should receive processed data from the backend.

4.11.3 The system should display the backend responses to the user interface.

4.11.4 The system should support near real time communication.

4.12 AI service integration

The system should integrate with external AI services.

4.12.1 The system should send user queries to an AI processing service.

4.12.2 The system should receive structured responses from the AI service.

4.12.3 The system should transform the AI outputs into gift card recommendation displays.

4.13 Use case: Gift Glimpse interaction

Actor: Recipient

Description: A recipient interacts with the gift glimpse interface search and selects a preferred gift.

Preconditions:

- The recipient has received a gift glimpse link.
- The system has available gift card catalog data.

Main flow:

1. The user opens the gift glimpse interface
2. The system displays initial gift recommendations
3. The users enters a query
4. The system processes the query using AI
5. The system updates gift recommendations dynamically
6. The system selects a preferred gift

Postconditions:

- A gift card is selected and switched.

4.14 Use case: No results handling

Actor: Recipient

Main flow:

1. The users enters a query
2. No matches are found
3. The system displays alternative suggestions
4. The system selects a preferred gift card option

Postconditions:

- A user is provided with alternative gift card options

5. Performance Requirements

5.1 Interface Performance & Responsiveness

The system should provide fast and responsive user interface performance.

5.1.1 The system should load the Gift Glimpse interface within 2 seconds under normal network conditions.

5.1.2 The system should display initial gift card recommendations within 1 second after page load.

5.1.3 The system should maintain UI responsiveness with no input delay greater than 100 ms.

5.2 Dynamic Updates & AI Interaction

The system should efficiently handle AI-driven updates and interactions.

5.2.1 The system should update gift recommendations within 2 seconds of receiving AI responses.

5.2.2 The system should process and return AI-generated recommendations within 3 seconds per query.

5.2.3 The system should maintain a continuous interaction session without resetting context during user interaction.

5.3 Image Loading Performance

The system should ensure efficient loading of images.

5.3.1 The system should load gift card images within 1 second per image on standard broadband connections.

5.3.2 The system should implement lazy loading so that only visible images are loaded initially.

5.3.3 The system should ensure that image loading does not increase total page load time beyond 3 seconds.

5.4 Search & Filtering Performance

The system should provide fast and reliable search functionality.

5.4.1 The system should return search results within 1 second of user input submission.

5.4.2 The system should display fallback suggestions within 1 second when no results are found.

5.4.3 The system should handle simultaneous search and AI queries without UI freezing.

5.5 Scalability & Load Handling

The system should scale effectively with increased usage and data.

5.5.1 The system should support at least 1,000 concurrent users without performance degradation.

5.5.2 The system should maintain response times within defined limits even with a catalog of 10,000+ products.

5.5.3 The system should scale to support increasing image and product data without exceeding 3-second load times.

5.6 Reliability & Availability

The system should ensure consistent availability and fault tolerance.

5.6.1 The system should maintain 99.5% uptime excluding scheduled maintenance.

5.6.2 The system should recover from failures and restore functionality within 5 seconds.

5.6.3 The system should ensure that partial failures (e.g., AI service delay) do not crash the UI.

5.7 Usability Performance

The system should provide an efficient and user-friendly experience.

5.7.1 The system should allow new users to complete a basic gift selection task within 2 minutes without training.

5.7.2 The system should provide clear feedback within 0.5 seconds for all user interactions (clicks, inputs).

5.7.3 The system should maintain consistent performance across desktop and mobile devices.

6. Environmental Requirements

6.1 Platform & Device Constraints

The system should operate across supported platforms and devices.

6.1.1 The system should operate on modern web browsers (Chrome, Safari, Firefox, Edge).

6.1.2 The system should support both desktop and mobile devices with responsive design.

6.1.3 The system should function on devices with a minimum of 4GB RAM and standard mobile hardware.

6.2 Integration Constraints

The system should integrate with required external services.

6.2.1 The system should integrate with an external AI service for natural language processing.

6.2.2 The system should rely on external product catalog data sources for gift card information.

6.2.3 The system should support external image storage systems for product images.

6.3 Network Constraints

The system should function reliably under network conditions.

6.3.1 The system should function over standard internet connections (≥ 10 Mbps).

6.3.2 The system should handle network latency gracefully, maintaining usability during delays.

6.3.3 The system should degrade gracefully if external services (AI or catalog APIs) are slow or unavailable.

6.4 Software & Technology Constraints

The system should follow defined software and communication standards.

6.4.1 The system should use web-based technologies (frontend and backend APIs).

6.4.2 The system should communicate via HTTP/HTTPS protocols.

6.4.3 The system should support real-time or near real-time API communication between frontend and backend.

6.5 Data & Storage Constraints

The system should manage data efficiently and consistently.

6.5.1 The system should store and retrieve gift catalog data and images from structured storage systems.

6.5.2 The system should ensure data consistency between AI outputs and product catalog data.

6.5.3 The system should support scalable storage for increasing product and image data.

6.6 Organizational / Client Constraints

The system should align with organizational and project requirements.

6.6.1 The system should align with the sponsor's requirement for a scalable UI supporting future expansion (e.g., physical products).

6.6.2 The system should support manual image uploading and maintenance workflows.

6.6.3 The system should follow the Scrum-based development process defined in the project plan.

6.7 Legal & Compliance Constraints

The system should comply with security and legal standards.

6.7.1 The system should ensure secure handling of user input data.

6.7.2 The system should comply with standard web security practices (HTTPS, secure APIs).

6.7.3 The system should not expose sensitive user or AI interaction data.

7. Potential Risks:

Now that we have discussed the meat of the requirements we will discuss the primary risks that stem from our solutions. We will detail out the likelihood, severity, and mitigation strategy to ensure that the system remains reliable and user friendly.

7.1 Incorrect/ Missing AI Recommendations:

- Likelihood: Medium-high
- Severity: High
- Description: the gift glimpse feature relies on AI-Driven natural language processing to generate the personalized recommendations. If there are misinterpretations of the user's input it may result in irrelevant suggestions.
- Impact: reduces user trust, frustration, and decreased value of the AI feature which is a core enhancement of the system
- Mitigation: use feedback loops, fallback logic, and regularly retrain and test the AI models with diverse user input.

7.2 Inaccurate or missing product images:

- Likelihood: Medium
- Severity: Medium-High
- Description: the redesigned multi-image gift cards depend on manually uploaded images across a large catalog of brands; missing, inconsistent or low-quality images will reduce visual/emotional impact
- Impact: Diminished user engagement and reduced emotional impact during gift selections.
- Mitigation: we will establish image quality standards and do validation checks during uploads. We will use placeholder images when there are missing ones and we will assign maintenance reviews as the catalog scales.

7.3 Dynamic UI Failures:

- Likelihood: Medium
- Severity: High
- Description: The system introduces dynamic UI updates and real-time AI interactions. performance issues such as lagging, glitching or failed updates are possible.
- Impact: Users' perception of the system will be diminished. It will seem as the system is unreliable or broken and negatively impact the users experience
- Mitigation: Conduct performance and load testing before deployment. monitor system performance in real time and optimize API response times and front end rendering.

7.4 Confusing User Experience:

- Likelihood: Medium
- Severity: Medium

- Description: while enhancements are aiming to simplify decision making, added features such as AI chat and dynamic updates may introduce complexity.
- Impact: Users will possibly struggle to navigate the interface or understand how to interact with the system
- Mitigation: conduct user testing with target audience, provide clear cues, maintain consistent navigation and interaction patterns..

7.5 Data Quality:

- Likelihood: Medium-High
- Severity: High
- Description: AI recommendations depend on accurate and consistent product metadata. Errors such as incorrect categories or missing fields can lead to bad recommendations.
- Impact: Reduced recommendation accuracy as well as diminishing the users confidence in the platform.
- Mitigation: We will enforce strict data validation rules during the data entry, implement automated data cleaning and consistency checks, standardize the metadata formats and regularly audit the catalog data.

7.6 Scalability risks:

- Likelihood: Medium
- Severity: High
- Description: As the platform expands to include more products including physical goods, the system demands on storage, performance and AI processing will increase.
- Impact: slow loading times, degraded AI performance, and increased maintenance complexity.
- Mitigation: we will design scalable architecture, optimize database, queries and incrementally test system performance as the catalog size increases.

Table Summary

Risk ID	Risk Name	Likelihood	Severity	Impact Summary	Mitigation Strategy
R1	Incorrect AI Recommendations	Medium-high	High	Irrelevant suggestions reducing trust	feedback loops, fallback logic, model training
R2	Missing Product Images	Medium	Medium-high	Weakens Visual Appeal	Image Validation, placeholders, audits
R3	Dynamic UI Failures	Medium	High	System feels unreliable	Load testing, monitoring
R4	Confusing User Experience	Medium	Medium	Users struggle to navigate	Usability testing
R5	Data Quality	Medium-High	High	Poor Recommendations	Data Validation
R6	Scalability Risks	Medium	High	Performance Degradation	Scalable Architecture, resource planning

8. Project Plan:

The execution of our solutions follows an iterative, Scrum style development process spanning across two academic semesters. The work is organized by two high level milestones that align with the functional requirements of the gift glimpse system and the priority over improving the recipient's experience. Each milestone is defined by one or multiple scrum sprints that span three to four weeks each. These three to four week sprints will deliver incremental value while maintaining flexibility as the requirements evolve.

The two major phases:

1. Foundational research and preparation (january - may)
2. Full system implementation (august - december)

This will ensure that the team enters the implementation phase with an understanding of the users needs, refined backlogs, and the necessary tools to support the development.

Our milestones are broken down as follows:

Milestone 1: user research, UX experiments, and problem validation

This milestone has established the foundation of the entire project. The team conducted user experiments on the recipient side to identify the gaps in the current recipient workflow, including lack of visual excitement, limited search functionality, and want for a guided experience. These findings informed the solution vision and functional requirements.

Milestone 2: user stories and backlog definition

The team refined the user stories with the sponsor and established the definitions of read and done. The sponsor-requested research into scrum coding practices ensures the team will align with the sponsors practice expectations. This milestone prepares the team for the development process coming up.

Milestone 3: image cataloging

This milestone is sitting before the implementation of the multi image gift card interface. The team will manually upload and organize all the product imagery for all gift card brands in current use.

Milestone 4: Multi-Image Gift card UI

This milestone will be where the development begins with the redesigned multi-image gift cards. This will include the responsive layouts and updated styling. The goal is to make the page feel like an emotionally engaging visual experience.

Milestone 5: AI Assistant Development part one: building test environment TDD

This milestone is the beginning of the AI Development for the Gift Glimpse. We will begin by building the test environment. We will begin by writing failing tests for the search behavior and following it with minimal implementation to ensure the search logic passes only when the intended behavior is met. This will allow us to iteratively build the AI driven search in small verifiable increments.

Milestone 6: AI Assistant Development part two: build MVP for demo

This milestone will continue the building of the AI feature by moving from the foundational testing to a functional MVP for demonstration. With the test environment established in milestone 5, the focus here is on implementing the essential components so the

AI can reliably interpret queries, call the appropriate tools and return meaningful results. This will involve writing the Claude 3 haiku model to the backend defining the initial tool calling schema and integrating the search handler with the Gift Glimpse catalog. The goal is to deliver a stable end-to-end slice that showcases the core functionality.

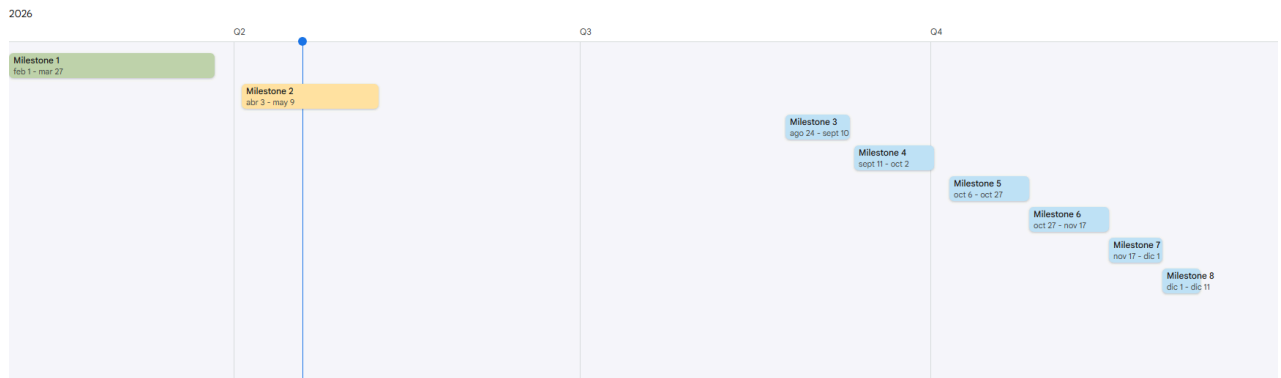
Milestone 7: AI Assistant Development part three: Full Integration and UI Alignment

This milestone will focus on integrating the AI assistants MVP functionality fully into the gift glimpse workflow. we will ensure that it operates seamlessly within the existing UI. We are focusing here on refining the assistants' responses, improving clarity of recommendations, and connecting the outputs to the frontend components that influence the user experience. This includes mapping AI-generated suggestions to the actual catalog items, validating tool-calling arguments against metadata stored in MongoDB and ensuring the edge cases are handled. The UI side goal is to create real time updates that reflect the assistant's reasoning and provide a smooth intuitive interaction flow. By the end of this milestone the AI should feel like a cohesive part of the platform.

Milestone 8: System Stabilization and Testing

This milestone will focus on validation. The full system after implementation of the ai and multi image UI will lead us to end-to-end testing. This testing will include accessibility checks, responsive layout adjustments, performance tuning, and ensuring the AI behaves reliably under real usage. We will also be finalizing documentation, updating the backlog with updated recommendations, and preparing for sponsor demonstration.

Visual representation for our project timeline:



9. Conclusion

The solutions we've proposed in this document establishes a clear path towards transforming the recipient experience into a more intuitive and emotionally engaging experience. By addressing the issues we found through user experiments and research, limited imagery, lack of emotional engagement, static interactions and overwhelm, we will lead Generous to deliver an experience that aligns with the users expectation and the wants of the sponsor. We have completed milestones one and two beginning the foundational development for the requirements ahead. These requirements, the addition of multiple images to the gift cards, improved Gift Glimpse searching, and optional AI assistant creates an experience that supports its users. With the defined requirements, knowledge of the risks and outlined next steps, the team is prepared to implement these changes. The improvements will strengthen the overall feel and engagement with the platform and ultimately help Generous evolve into a gifting experience that feels personal, thoughtful and effortless.

Sources

Business Research Insights. "Gifting Market Size, Share, Growth, and Industry Analysis, 2026–2035." 23 Mar. 2026, <https://www.businessresearchinsights.com/market-reports/gifting-market-117441>.