Project Analysis

GiftPal – The Ultimate Gift Exchange and Reminder App

Submitted in fulfillment

Of the requirements of

CMSC 495 Current Trends and Projects in Computer Science

(Group Project)

Bazz Khurshid

Graham Primm

Kalala Kalamba

Nicholas Sink

|  |  |
| --- | --- |
| **Document ID** | GiftPal PA -v1.4.1 |
| **Version Number** | 1.4.1 |
| **Due Date** | May 07, 2023 |
| **Classification** | Public |
| **Instructor** | Hung Dao |
| **This submission is by** | Bazz Khurshid, Graham Primm, Kalala Kalamba, Nicholas Sink |

**Revision History**

|  |  |  |  |
| --- | --- | --- | --- |
| **Date** | **Version** | **Description** | **Author (s)** |
| 03/30/2023 | 1.0 | Draft Version | Nicholas Sink |
| 03/31/2023 | 1.0.1 | Added Input/Output Data and their destinations | Bazz Khurshid |
| 04/02/2023 | 1.0.2 | Added Subsystems to Functional Requirement Table, Possible Enhancements, Possible Risks and Risk Mitigation | Primm Graham |
| 04/04/2023 | 1.0.3 | Added Subsystem Diagram and Descriptions | Nicholas Sink |
| 04/04/2023 | 1.0.4 | Added conversion of input data into output data | Bazz Khurshid |
| 04/04/2023 | 1.0.5 | Specified the data processing step | Kalala Kalamba |
| 04/04/2023 | 1.0.6 | Added the context diagram | Kalala Kalamba |
| 04/04/2023 | 1.1 | Made cosmetic changes to submit | Bazz Khurshid |
| 04/11/2023 | 1.1.1 | Gave a more detailed answer to listing steps the app will take to convert input data into output data. | Bazz Khurshid |
| 04/11/2023 | 1.1.2 | Elaborated on what pieces of data will be taken from the database to be sent out. | Bazz Khurshid |
| 04/11/2023 | 1.1.3 | Listed the data to be stored in the database | Bazz Khurshid |
| 04/11/2023 | 1.2 | Final Review | Bazz Khurshid |
| 05/06/2023 | 1.3 | Updated Analysis section to be in line with final project | Bazz Khurshid |
| 05/07/2023 | 1.4 | Updated Requirements Table | Nicholas Sink |
| 05/07/2023 | 1.4.1 | Updated Analysis section to be in line with final project | Nicholas Sink |

**Analysis**

1. What are the input data?
   1. The following data shall be inputted as text.
      1. The user’s name.
      2. The user’s email.
      3. The user’s group name.
      4. Names of other members of the user’s group.
      5. Whether the user is an administrator.
      6. The user’s customized important days.
      7. Every individual user’s wish list of gifts.
2. What are the sources of input data?
   1. All sources of input data will be in text.
      1. These sources of input data will come from the various users entering in their information on the website.
      2. There will be no input data that does not come from individual users.
3. What are the output data?
   1. Webpages will be rendered with directions/questions for the user to input their data (including but not limited to “username”, “password”, “group registration”)
   2. Email reminders to the user.
   3. Email reports to the user on paired gift givers and gift receivers.
4. What are the destinations of output data?
   1. There will be two destinations of output data.
      1. The webpages being rendered. In addition to the webpages being rendered, there will also be messages displayed on the webpages once a user successfully registers themselves, creates a new user, and modifies a group.
      2. The user’s email. This will be output data such as email reminders of special days, reports on the paired givers and receivers list, and gift suggestions.
5. How do we convert the input data into output data?
   1. There are two ways we convert input data into output data.
      1. The output data will be affected by the input data. The webpages will react to the user’s input such as button clicks and input of text data. The webpages and messages rendered will react differently depending on how the user navigates the site and inputs the correct data.
         1. The steps taken to convert input data into output data depend on the scenario. To be more specific, the information displayed to the user (output data), depends almost entirely on the actions the user takes. These actions are summarized under the list of scenarios below.
         2. These scenarios include:
            1. User Registration

The initial webpage will show the main page with a user menu at the top. with the start of the application.

The user will click the “Register” button at the top to register an account. This is input data.

The registration form, output data, will be displayed to the user.

The user will input their name, email address, date of birth (DOB), password.

This data will then be sent to the database to be saved.

* + - * 1. User Login

The initial webpage will show the main page with a user menu at the top. with the start of the application.

The user will click the “Login” button at the top to login to their account. This is input data.

The user will indicate they would like to login. This is input data.

The login form, output data, will be displayed to the user.

The user will input their email address, and password.

This data will then be verified with information stored in the database.

If the login is successful, the user will be navigated to the /profile webpage and the menu at the top will include “Profile”, “Events”, “Wishlist”, “Home”, “Groups”, “Password Reset”, and “Logout”.

If the login is a failure, the user will receive a failure message stating “Invalid username or password” and stay at the login page.

* + - * 1. Gift Preference Addition

After the user successfully logs into their account (please see user login scenario), the user will click the “Wishlist” button from the menu.

The user will see their previous wish list (output data) and will click the button “Add New Wish” to add their new gift preference (input data).

The user inputs the additional preferences (the name of the gift) and clicks “Add Wish”.

The name of the gift is stored in the database under the user’s account gift preferences and the user is navigated back to the “Wishlist” webpage where their new item is on the list (output data)

* + - * 1. Customized Events

After the user successfully logs into their account (please see user login scenario), the user will click the “Events” button from the menu.

The user will see all their events (output data) and will click the button “Add New Event” to add a new customized event (such as birthdays, anniversaries, etc.,) (input data).

The user inputs the additional event (the name of the event, the date of the event, whether it is a birthday, anniversary or a custom event and an input of the name of the event if it is custom) and clicks “Add Event”.

The name of the event is stored in the database under the user’s account and the user is navigated back to the “Events” webpage where their new item is on the list (output data)

* + - * 1. Group Registration

After the user successfully logs into their account (please see user login scenario), the user will click the “Groups” button from the menu.

The user will see all groups and will click the button “Create New Group” to register a new group (input data).

The webpage displayed (output data) asks the user to input the group name, and the minimum dollar amount.

The user will input this information and click “Register Group”.

The new group is now stored in the database and a success message (output data) is displayed to the user.

The user is directed back to the Groups page where their new group should be added to the Groups list.

* + - * 1. Gift Exchange Initiation

After the user successfully logs into their account (please see user login scenario), the user will click the “Groups” button from the menu.

The user will click on the group name which will take them to the group page.

If the gift exchange has not already been initiated, then there will be a button on the right of the page which states “Initiate Group Exchange”.

The user will click the “Initiate Group Exchange”.

The output data displayed on the same page will show the user the gift pairings on the page.

Emails will be sent to each individual user informing them of who they are paired with.

* + - * 1. Modify Group

After the user successfully logs into their account (please see user login scenario), the user will click the “Groups” button from the menu.

The user will see all groups and will click the button “Modify Group” of the group they want to add/delete a user to or make a user an admin to the group.

If the user is an admin of the group, a webpage will be displayed that allows the user to modify the group name, the minimum dollar amount, and modify users by adding a user, deleting a user or making a user an admin.

Once the user inputs the modifications they want (input data), then the user will click the “Save Changes” button.

The information imputed will be saved in the database or if it is a deletion, that user will be removed from the group database that lists them.

The software then displays a success message to the user and directs the user to the Groups page.

* + 1. Most of the input data will be stored in a database. When we send information to the user, such as through their email, we will grab several pieces of data from the database, depending on what information we are sending to the user, and email it to the user.
       1. The information we will pull from the database depends on the specific scenario. The items listed below are all the pieces of data that can be retrieved from the database (for more information on when this information will be retrieved, please see everything under 5.a.i.2):
          1. The user’s first name.
          2. The user’s last name.
          3. The user’s email.
          4. The user’s group name.
          5. The user’s gift preferences.
          6. The user’s special dates.
          7. All first names, last names, and gift suggestions for all the users in the group
          8. The minimum dollar amount for the group.
    2. The data that will be saved in the database includes:
       1. The user’s first name.
       2. The user’s last name.
       3. The user’s email address
       4. The user’s password.
       5. The user’s DOB.
       6. The special dates the user wants to input.
       7. The group name.
       8. Gift preferences of the user.
       9. The minimum dollar amount of the group.
       10. Whether the user is an admin of a specific group.

**Requirements**

|  |  |
| --- | --- |
| **Requirement #** | **Description** |
| 1 | This system shall allow users to register themselves. |
| 2 | This system shall allow users to create or register with a group by answering a prompt response once they have registered themselves as a user. |
| 3 | This system shall keep track of anniversary dates. |
| 4 | This system shall keep track of birthdays. |
| 5 | This system shall keep track of customized important days. |
| 6 | This system shall keep track of a wish list for the user. |
| 7 | This system shall allow users to store their email. |
| 8 | This system shall allow users to store their name. |
| 9 | This system shall allow users to store the name of their loved ones. |
| 10 | This system shall allow users to associate special dates with specific loved ones. |
| 11 | This system shall allow users to enter their names in a gift exchange. |
| 12 | This system shall allow users to note the gift they would like to receive. |
| 13 | This system shall allow users to identify their group name (the group name will refer to the users bundled together for the gift exchange). |
| 14 | This system shall ensure that the user and all members of their group are a part of the pool of potential givers for each other. |
| 15 | The system shall randomly and automatically select a gift receiver and pair them with a gift giver once the user tells the system they will be a part of a gift exchange. |
| 16 | This system shall send an email to the users notifying them who their gift pair is. |
| 17 | This system shall not duplicate user ids. |
| 18 | This system shall not send more than one email for every reminder or notification. |
| 19 | The system shall allow a user to register as an admin for the group. |
| 20 | The system shall allow the group admins to add, modify and delete users. |
| 21 | The system shall allow the group admin to set a minimum dollar amount for gifts. |
| 22 | The system shall allow the user to register others in their group. |
| 23 | The system shall present a menu to initiate the gift exchange. |
| 24 | The system shall allow the user to identify themselves when initiating the gift exchange. |
| 25 | The system shall remove the selected receiver from the list of unselected receivers and remove the giver from the list of givers once both have been paired together. |
| 26 | This system shall send a report showing paired givers and receivers to email addresses provided in user registration. |
| 27 | The system shall provide a system administrator account for setting the application email and API keys. |

**Specifying the Data Processing**

**Admin Registration**

* The default user registers => database is updated

**User Registration**

* User register fills out a form by providing name, email address, DOB, groups name, and additional important dates if applicable => Data is saved in the Database assigning a unique ID to each User
* The user creates a wish list for a specific event => database is updated with a wish list and user ID
* The system identifies all users belonging to the same group, based on the unique group id.

**Admin Tasks**

* Admin defines User Roles => Data is saved in Database with unique IDs for each Role defined.
* Admin defines the type of Events (Birthdays, Anniversaries…) => Data is saved in Database with unique IDs for each type of event.
* Admin adds, modifies, and deletes users from groups => database is updated (for addition, a unique ID is assigned to a newly created user).

**Track Events**

* The system tracks dates stored in the database and sends appropriate notifications based on the event type (Anniversary, Birthday…) => database is updated.

**Gift Exchange**

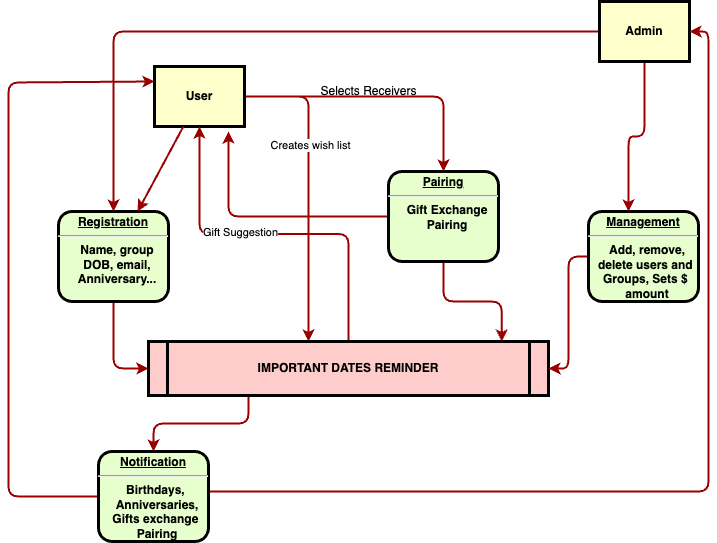
* Randomly and automatically select a gift receiver and pair them with a gift giver once the user tells the system they will be part of a gift exchange.
* Update the database with the gift exchange information.
* The System sends the saved wish list of a receiver to the giver. => Database is updated.

**Avoiding self-gifts**

* The system uses stored data to identify all users of the same group and ensures that they are not picked when one of the group members is making the selection.

**Context Diagram**

Data between the app and the outside system:



**Subsystem Diagram**Diagram, schematic

Description automatically generated

**Descriptions of the subsystems:**

1. *User Interface Subsystem*: This subsystem is responsible for presenting an interface that enables users to register, enter important dates and names of people to be tracked by the application, add gift preferences, register users in their gift exchange group, and initiate the gift exchange. It allows users to view their gift pair and their gift preferences. The User Interface Subsystem interacts with the Administration Subsystem to register or delete users. It also interacts with the Gift Suggestion Subsystem to provide gift ideas based on the user's preferences and with the Email Notification Subsystem to notify users about their gift pair and their gift pair's wish list.
2. *Gift Suggestion Subsystem*: This subsystem is responsible for generating gift suggestions based on the user's preferences. It uses machine learning algorithms and user data to provide personalized suggestions. The Gift Suggestion Subsystem interacts with the Database Subsystem to retrieve information about the available products and their characteristics.
3. *Email Notification Subsystem*: This subsystem is responsible for sending email notifications to the users to inform them about their gift pair and their gift pair's wish list. It receives information about the user's gift pair and their wish list from the Database Subsystem and delivers the email to the application users.
4. *Administration Subsystem*: This subsystem is responsible for managing the users of the application. It also allows administrators the ability to add, modify, and delete users, as well as set a minimum dollar amount for gifts. The Administration Subsystem stores and retrieves user data and manages gift exchange groups. It communicates with the User Interface Subsystem to initiate the gift exchange and with the Email Notification Subsystem to send reports showing paired givers and receivers to email addresses provided in user registration.
5. *Database Subsystem*: This subsystem is responsible for storing and managing data related to users, gift suggestions, and other system entities. It provides a centralized and reliable storage solution for the system's data. The other subsystems interact with the Database Subsystem to retrieve and store data as needed.

**Subsystems to Functional Requirement Table**

|  |  |
| --- | --- |
| **Requirement #** | **Subsystems** |
| 1 | User Interface Subsystem, Administration Subsystem, Database Subsystem |
| 2 | User Interface Subsystem, Administration Subsystem, Database Subsystem |
| 3 | Database Subsystem |
| 4 | Database Subsystem |
| 5 | Database Subsystem |
| 6 | Database Subsystem |
| 7 | User Interface Subsystem, Database Subsystem |
| 8 | User Interface Subsystem, Database Subsystem |
| 9 | User Interface Subsystem, Database Subsystem |
| 10 | User Interface Subsystem, Database Subsystem |
| 11 | User Interface Subsystem, Gift Suggestion Subsystem |
| 12 | User Interface Subsystem, Gift Suggestion Subsystem |
| 13 | User Interface Subsystem, Gift Suggestion Subsystem |
| 14 | Administration Subsystem, Database Subsystem |
| 15 | Gift Suggestion Subsystem |
| 16 | Email Notification Subsystem, Gift Suggestion Subsystem, Database Subsystem |
| 17 | Administration Subsystem |
| 18 | Email Notification Subsystem |
| 19 | User Interface Subsystem, Administration Subsystem |
| 20 | User Interface Subsystem, Administration Subsystem |
| 21 | User Interface Subsystem, Gift Suggestion Subsystem, Database Subsystem |
| 22 | User Interface Subsystem, Gift Suggestion Subsystem, Database Subsystem |
| 23 | User Interface Subsystem, Gift Suggestion Subsystem |
| 24 | User Interface Subsystem, Gift Suggestion Subsystem |
| 25 | Gift Suggestion Subsystem, Database Subsystem |
| 26 | Email Notification Subsystem, Gift Suggestion Subsystem, Database Subsystem |
| 27 | Gift Suggestion Subsystem, Database Subsystem |

**Possible Enhancements**

1. Integrating with social media platforms to import more events and special days.
2. Providing suggestions for gifts based on past gift exchanges and wish lists.
3. Allowing users to create and share wish lists with friends and family outside of the application.
4. Adding a feature to track and suggest gift ideas for group events like weddings or baby showers.
5. Integrating with online retailers to make purchasing gifts easier for users.
6. Adding a reminder feature for important tasks related to the special day like ordering a cake or making a dinner reservation.

**Possible Risks and Risk Mitigation**

1. Data breaches due to unauthorized access to the database Mitigation: Implementing secure authentication mechanisms, encryption of sensitive data, regular security audits, and limiting access to the database only to authorized personnel.
2. Server crashes due to high traffic or other technical issues Mitigation: Implementing load balancing and failover mechanisms to ensure uninterrupted service, regularly monitoring the system for performance issues, and having a disaster recovery plan in place.
3. User dissatisfaction with gift exchanges due to mismatched preferences or inappropriate gifts Mitigation: Providing clear guidelines and suggestions for gifts, allowing users to communicate anonymously with their gift exchange partner to clarify preferences, and giving users the ability to report inappropriate behavior.
4. Misuse of personal data by the application or its employees Mitigation: Implementing strict privacy policies, only collecting and storing data necessary for the application's functionality, conducting regular training for employees on data privacy, and allowing users to easily delete their data from the system.