Global Personal Marketplace

System Requirements Specification (SRS)

Version 1.0

Produced for:

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Executive Overview

The Global Personal Marketplace (GPM) system will be a global Web-based marketplace bringing together private individuals and small companies to buy and sell all manner of items. It will take advantage of the Internet and World Wide Web to radically improve the way they buy and sell items.

The **buyer** objectives for the GPM are to:

- Provide them with a huge selection of items (and sellers).
- Enable them to easily search for, find, and buy the items they want.
- Enable them to buy items that they could not ordinarily find or afford.
- Enable them to help set (and thereby minimize) the price of the items they wish to buy (e.g., via auctions and reverse auctions).
- Make buying more convenient by allowing them to buy items:
  - Anytime (i.e., 24 hours a day and 7 days a week).
  - Anywhere that the buyers have access to the Internet (e.g., at home, at work, and while traveling).
- Minimize risks associated with buying over the Internet.

The **seller** objectives for the GPM are to:

- Provide them with a huge customer base of potential buyers.
- Enable them to easily target and personalize their marketing to appropriate potential buyers.
- Enable them to sell items that they could not otherwise afford to sell (e.g., by minimizing their overhead and transaction costs).
- Enable them to determine the market price of their items and set their prices accordingly (e.g., via auctions or direct sales).
- Make selling more convenient by allowing them to sell items:
  - Anytime (i.e., 24 hours a day and 7 days a week).
  - Anywhere the sellers have access to the Internet (e.g., at home, at work, while traveling).
- Minimize risks associated with selling over the Internet.

The **GPMC** objectives for the GPM are to:

- Minimize the costs of providing a marketplace (e.g., capital costs, labor costs) compared to a physical marketplace (e.g., a shopping mall) by maximizing automation and thus minimizing labor and facilities costs.
- Maximize income by maximizing the number of sellers (i.e., merchants) paying marketplace fees.

Revision History

Date	Version	Description	Author
10/14/1999	0.1	Initial Draft including Introduction. Identified most externals and associated use cases.	Donald Firesmith
10/23/1999	0.2	Added use case and path requirements for Accountant and User. Identified remaining use cases. Specified some paths. Added some quality requirements	Donald Firesmith
11/13/1999	0.3	Updated actor hierarchy with employees. Added usage to definition. Updated operational capabilities. Added use case requirements, business justifications, and requirements trace to the Application Vision Statement. Added use case path requirements, assertions and interactions for all actors. Completed quality requirements. Added business rules under design constraints. Ensured naming consistency with User Interface Design Document.	Donald Firesmith
12/09/1999	0.4	Added User Support Agent. Moved updating passwords to the actor. Updated to make consistent with User Interface Design Document. Added reviewers' comments.	Donald Firesmith
12/20/1999	0.5	Added quality requirements. Removed business rules.	Donald Firesmith
1/07/2000	0.6	Updated security. Iterated use case paths based on conceptual architecture.	Donald Firesmith
1/25/2000	0.7	Added direct sales (fixed-price and decreasing-price). Removed unnecessary user interface design constraints. Generalized minimum billing balance. Removed seller's ability to select winning buyers.	Donald Firesmith
2/23/2000	0.8	Updated security requirements. Added security officer as actor. Removed additional unnecessary user interface design constraints.	Donald Firesmith
5/14/2000	0.9	Removed additional unnecessary user interface design constraints. Added additional direct sales use case paths.	Donald Firesmith
3/3/2001	1.0	Added business rules. Added accessibility requirements. Added industry standard constraints.	Donald Firesmith
3/16/2002	1.1	Added executive summary. Added buyer listings. Updated quality requirements.	Donald Firesmith

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1   Introduction

The section introduces the system requirements specification (SRS) for the Global Personal Marketplace (GPM) system to its readers.

1.1   Specification Definition

This specification documents the system-level requirements for the GPM system.

1.2   Specification Objectives

The objectives of this specification of the GPM are to:

- Provide a system overview of the GPM including definition, goals, objectives, context, and major capabilities.
- To formally specify its associated:
  - Functional requirements.
  - Data requirements.
  - Quality requirements.
  - Constraints.

1.3   Intended Audiences

The intended audiences of stakeholders for this specification of the GPM include:

- **Global Personal Marketing Corporation (GPMC) Employees:**
  - Managers
  - Customer Representatives, who must approve it.
  - Accountants, who will perform accounting functions using the GPM.
  - Security Officers, who will respond to potential security violations of the GPM.
  - User Support Agents, who will provide a human interface for the GPM to the users.
- **Firesmith Consulting Employees** (especially members of the GPM Project Team):
  - Project Managers
  - Architects, whose overall architecture must meet the requirements specified in this SRS.
  - Designers, whose design must meet the requirements specified in this SRS.
  - Hardware Engineers, whose hardware components must implement the requirements specified in this SRS.
  - Programmers, whose software components must implement the requirements specified in this SRS.
  - Quality Engineers, who must ensure the quality of its quality requirements.
  - Testers, who must ensure that the requirements are validatable and whose tests must validate the requirements.
  - Usability Engineers, who must ensure that the user interfaces fulfill the usability requirements.
- **Users**, who are any private individuals or small businesses that take part in a sale held in the GPM:
  - Buyers, who will use the GPM to attempt to buy one or more items being sold in the GPM.
  - Sellers, who will use the GPM to place one or more items up for sale.

1.4   References

This specification references or complies with the following documents:

- **GPM Project Documents:**
  - GPM Application Vision Statement, which documents the business goals to be achieved by the requirements specified in this specification

- GPM Glossary, which defines the business and technical terms used in this specification.
- GPM Release Plan, which documents the scheduled incremental release of the GPM in terms of the requirements specified in this requirements specification.

- **OPEN Process Framework (OPF) Conventions:**
  - Use Case Modeling Guidelines, which documents the guidelines used to develop the use case model specifying the functional requirements in this specification.
  - System Requirements Specification Content and Format Standard, which specifies the content and format of this specification.
  - System Requirements Specification Inspection Checklist, which is used during the inspection of this specification.
  - System Requirements Specification Template, which provides the skeleton of this specification.

1.5 Specification Overview

This specification is organized into the following sections:

- *Introduction*, which introduces the specification for the GPM to its readers.

- *System Overview*, which provides a brief, high level description of the GPM including its definition, business goals, business objectives, context, and capabilities.

- *Functional Requirements*, which specifies the functional system requirements in terms of a use case model consisting of each external's use cases and use case paths.

- *Data Requirements*, which specifies the system data requirements in terms of required data components.

- *Quality Requirements*, which specifies the required system quality factors.

- *Constraints*, which documents required architecture, design, and implementation constraints on the GPM.

- *Appendices*, which defines ancillary information including future envisioned enhancements, open issues, TBDs, and assumptions.

2   Global Personal Marketplace System Overview

This section provides a high level description of the Global Personal Marketplace (GPM) system including its definition, primary business goal, business objectives, context, and capabilities.

2.1   Definition

The Global Personal Marketplace (GPM) system will be a global Web-based marketplace bringing together private individuals and small companies to buy and sell all manner of items.

2.2   Business Goal

The business goal of the Global Personal Marketplace (GPM) system is to take advantage of the Internet and World Wide Web to radically improve the way private individuals and small companies buy and sell items.

2.3   Business Objectives

The business objectives of the GPM are to provide the following business benefits to its buyers, sellers, and owners.

2.3.1   Buyer Business Benefits

The GPM will:

- Provide its buyers with a huge selection of items (and sellers).
- Enable its buyers to easily search for, find, and buy the items they want.
- Enable buyers to buy items that they could not ordinarily find or afford.
- Enable buyers to help set (and thereby minimize) the price of the items they wish to buy (e.g., via auctions and reverse auctions).
- Make buying more convenient by allowing buyers to buy items:
  - Anytime (i.e., 24 hours a day and 7 days a week).
  - Anywhere the buyers have access to the Internet (e.g., at home, at work, and while traveling).
- Minimize risks associated with buying over the Internet.

2.3.2   Sellers Business Benefits

The GPM will:

- Provide its sellers with a huge customer base of potential buyers.
- Enable its sellers to easily target and personalize their marketing to appropriate potential buyers.
- Enable its sellers to sell items that they could not otherwise afford to sell (e.g., by minimizing their overhead and transaction costs).
- Enable its sellers to determine the market price of their items and set their prices accordingly (e.g., via auctions or direct sales).
- Make selling more convenient by allowing sellers to sell items:
  - Anytime (i.e., 24 hours a day and 7 days a week).
  - Anywhere the sellers have access to the Internet (e.g., at home, at work, while traveling).
- Minimize risks associated with selling over the Internet.

2.3.3   Marketplace Owner Business Benefits

The GPM will:

- Minimize the costs of providing a marketplace (e.g., capital costs, labor costs) compared to a physical marketplace (e.g., a shopping mall) by maximizing automation and thus minimizing labor and facilities costs.

- Maximize income by maximizing the number of sellers (i.e., merchants) paying marketplace fees.

2.4   Context of the Marketplace

This subsection documents the context of the GPM in terms of the significant externals with which it interacts. As illustrated in the following context diagram, the Global Personal Marketplace (GPM) interfaces with several external actors and systems:

- Individuals and small businesses can act as users in either the buyer or seller role. Buyers buy items sold and shipped by the sellers when those items are bought and sold in the GPM.

- Accountants, security officers and user support agents are employees who work for Global Personal Marketing Corporation. Accountants perform their accounting duties using the GPM. Security Officers handle security violations of the GPM. User support agents provide user support for the GPM.

- The GPM authorizes credit card purchases of items via the authorization processor gateway.
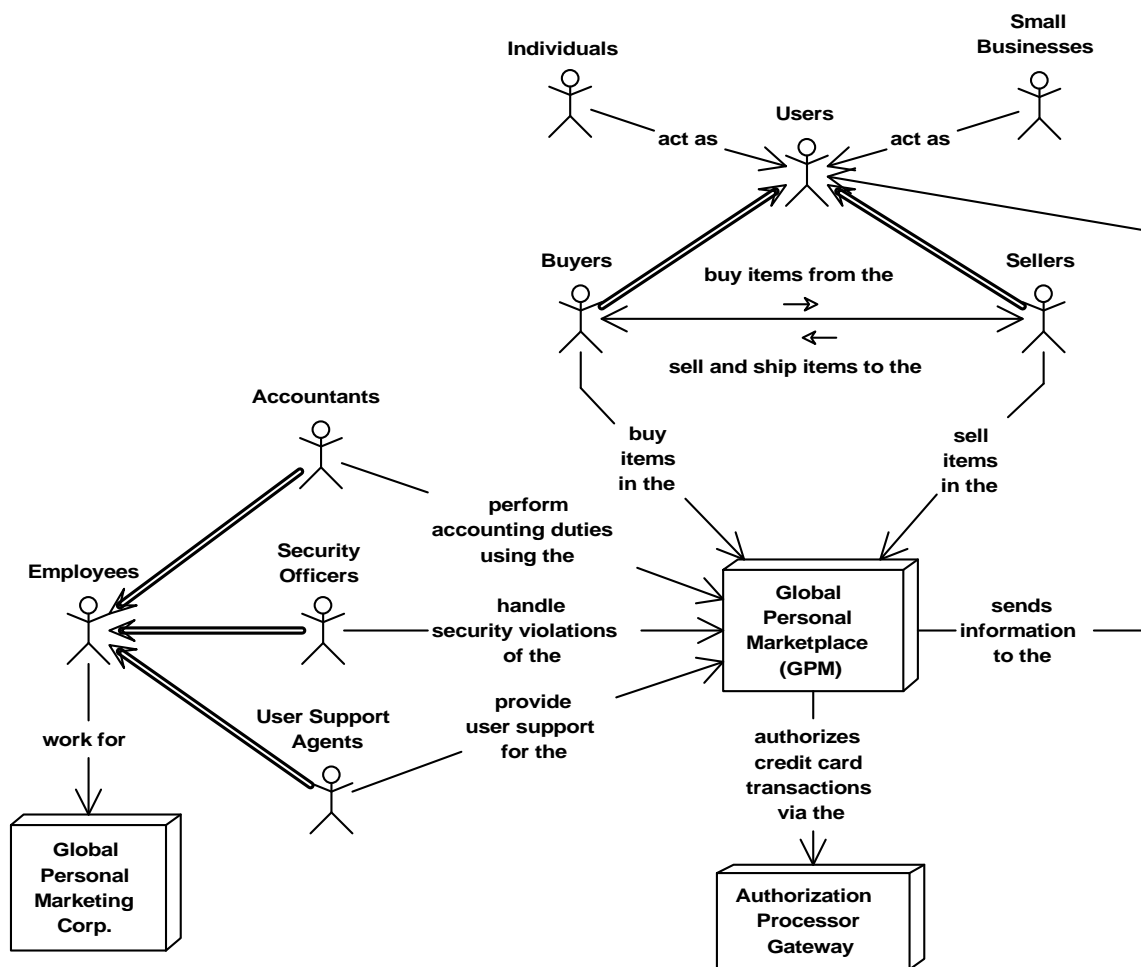
Figure 1: Global Personal Marketplace Context Diagram

2.4.1   External Hardware

The GPM interacts, either directly or indirectly, with the following significant external hardware:

- **Client Hardware**:
  - **Employee Workstations**, which are the personal computers used by employees to perform their tasks.
  - **User Client**, which are the personal computers, personal digital assistants (PDAs), and smart phones used by users to communicate with each other and with the GPM over the Internet.
- **Networks**:
  - **Internet**, which is the global network used for communication among employees, users, and the GPM.
  - **Local Area Network**, which is the GPMC-internal local area network used for communication among employees and the GPM.
  - **Leased Phone Line**, a dedicated telephone line connecting the GPM to the authorization processor gateway.

2.4.2   External Roles

The GPM interacts, either directly or indirectly, with the following significant client roles:

- **Employees**, who are any actors who works for GPMC:
  - **Accountants**, who are any GPMC employees who perform accounting functions using the GPM.
  - **Security Officers**, who are any GPMC employees who respond to potential security violations of the GPM.
  - **User Support Agents**, who are any GPMC employees who provide human support to the GPM users.
- **Users**, who are any individuals or small businesses that buy and sale items in the GPM:
  - **Buyers**, who are any users who use the GPM to attempt to buy one or more items being sold by a seller using the GPM.
  - **Sellers**, who is any users who use the GPM to place one or more items up for sale.

2.4.3   External Software

The GPM interacts, either directly or indirectly, with the following significant client software:

- **Browser**, which is the software tool that runs on employee and user personal computers that allow them to communicate over the networks with the GPM.

2.4.4   External Systems

The GPM interacts, either directly or indirectly, with the following significant external systems:

- **Authorization Processor Gateway**, which is the server system that provides a common interface to the numerous processors of credit card payment authorizations.

2.5 Global Personal Marketplace Capabilities

This subsection provides a high-level overview of major capabilities of the GPM. Note that this subsection provides useful information for understanding the following requirements, but does not contain specific testable requirements.

2.5.1 Summary of System Capabilities

2.5.1.1 Employee Capabilities

The GPM will provide the following capabilities to employees:

- **Accountants**. The GPM will enable accountants to:
    - Generate financial reports.
    - Update billing cycle.
    - Update the fee schedule.
    - Updates user restrictions.
- **Security Officers**. The GPM will
    - Notify security officers of security violations.
    - Enable security officers to generate security violation reports.
- **User Support Agents**. The GPM will enable user support agents to:
    - Handle user inquiries.
    - Sanction users who violate the user agreement.

2.5.1.2 Users Capabilities

The GPM will provide the following capabilities to users:

- **Buyers**. The GPM will enable buyers to:
    - Search for items and sellers.
    - Register, modify, and cancel listings of desired items on which sellers can either bid (reverse auction) or place offers (direct purchase).
    - Take part in sales:
        - Place, modify, and withdraw bids on items at seller auctions.
        - Respond when notified of being outbid.
        - Buy items at direct sales.
        - Place, modify, and withdraw sealed offers at decreasing price sales.
    - Review seller feedback history.
    - Register feedback about seller.
    - Register for notification of future sales.
    - Respond when notified of successful transaction.
- **Sellers**. The GPM will enable sellers to:
    - Read seller guidelines.
    - Register, modify, and cancel sales of items on which buyers can either bid (auction) or directly purchase.
    - Respond when notified of auction results.
    - Respond when notified of direct sales.
    - Register responses to buyer's feedback.
    - Review their ongoing and recent sales.
    - Review their account status.
    - Make inquiries regarding account.
- **Users**. The GPM will enable all users to:
    - Read general information and user guidelines.
    - Register and maintain a user account:
        - Review and manage their user information (e.g., contact information, credit card information).

- Review and manage their account history (e.g., listings, transactions, fee payments).
- Review and annotate their individual feedback history.
- Accept the GPM privacy policy and user agreement.
- Pay listing and transaction fees by credit card.

2.5.1.3 Other Capabilities

- **Authorization Processor Gateway**. The GPM will use the authorization processor gateway to:
  - Request authorization of credit card payments via a dedicated leased telephone line.

3   Functional Requirements

The section of the SRS specifies the functional requirements of the GPM in terms of use cases and their associated use case paths. The use case model is primarily organized in terms of the externals that benefit from the use cases.

3.1   Summary Use Case Diagrams

The following use case diagrams summarize the functional requirements for the GPM:

- Employee Summary Use Case Diagram

- User Summary Use Case Diagram
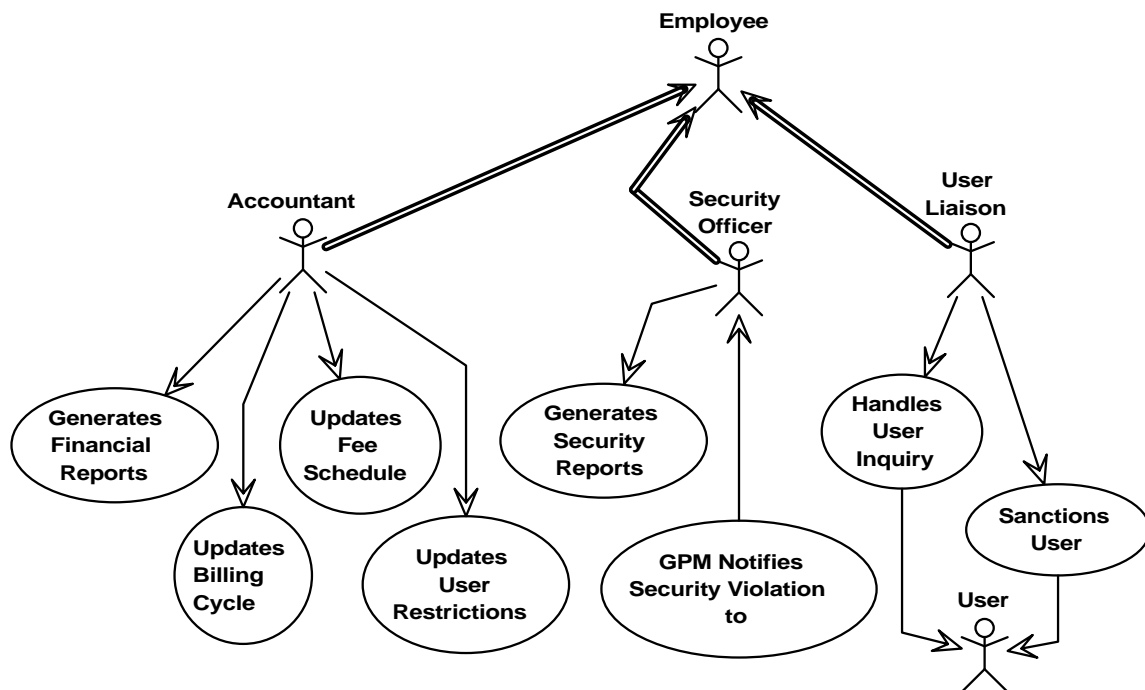
Figure 2: Employee Summary Use Case Diagram

User

Displays General Information

Displays Own Feedback History

Obtains User Email Address

Registers User Account

Reviews His Account Status

Bidder

Precedes

Logs On

Precedes

Inquires Regarding His Account

Precedes

Seller

Precedes

Logs Off

Maintains User Account

Reads Bidder Instructions

Searches For Item

Registers For Notification of Future Auctions

Reads Seller Instructions

Registers Auction

Reviews Bid History

Precedes

Precedes

Precedes

Precedes

Precedes

Precedes

Reviews Seller's Feedback History

EAS Notifies Bidder of Relevant Auction

Reviews His Bidder's Feedback Histories

EAS Notifies Seller of Auction Results

Places Bid On Item

Cancels Auction

Precedes

Precedes

EAS Notifies Bidder of Being Outbid

Modifies Bid On Item

Reviews His Auctions

Selects Winning Bidder

Precedes

Precedes

Precedes

Precedes

EAS Notifies Winning Bidder of Auction Results

Precedes

Registers Feedback About Winning Bidder

Registers Feedback About Seller

Figure 3: User Summary Use Case Diagram

3.2   External Roles

This subsection describes and specifies external roles, the associated responsibilities, and all use cases primarily driven by these externals.

3.2.1   Accountant

The subsection specifies the functional requirements primarily associated with accountants.

Definition

An *accountant* is the role played by a GPM employee who performs accounting functions using the GPM.

Responsibilities

An accountant has the following responsibilities:

- Set and maintain the billing cycle, fee schedule, and user restrictions.
- Ensure that the GPM follows proper accounting procedures.
- Report on the financial status of GPM.

Required Capabilities

An accountant needs the following required technical expertise, experience, and training to effectively interact with the GPM:

- Basic accounting skills
- Use an accountant client computer to log onto and navigate the accountant user interface.

Use Case Diagram
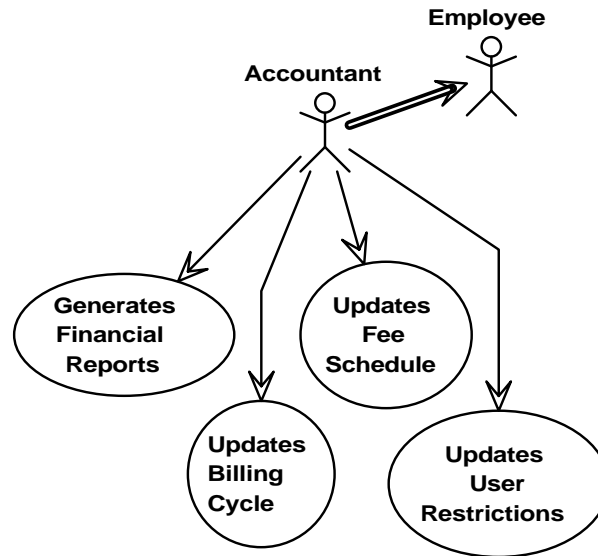
Figure 4: Accountant Use Case Diagram

Use Cases

- Accountant Generates Financial Reports
- Accountant Updates Billing Cycle
- Accountant Updates Fee Schedule
- Accountant Updates User Restrictions

3.2.1.1 Use Case: Accountant Generates Financial Reports

Use Case Requirement

The GPM shall enable accountants to generate the following financial reports:

- Feedback Summary Report
- Fees Summary Report
- Invoice Summary Report
- Listings Summary Report
- User Summary Report

Business Justification

- GPMC management needs the financial reports to understand the financial status of the company.
- The CFO needs the financial reports to financially manage the GPMC.

Requirements Trace

- AVS OG-AC-1) Generate Financial Reports

Use Case Paths

- Normal:
  - Feedback Summary Report Generated
  - Fees Summary Report Generated
  - Invoice Summary Report Generated
  - Listings Summary Report Generated
  - User Summary Report Generated
- Exceptional:
  - None

3.2.1.1.1 Normal Path: Feedback Summary Report Generated

Path Requirement

The GPM shall enable accountants to generate feedback summary reports.

Externals

- Accountant (Client)

Preconditions

- The GPM has identified and authenticated the accountant.

Interactions

1. The accountant requests a feedback summary report for a specific month and year from the GPM.
2. The GPM shall send the feedback summary report for the requested month and year to the accountant.
3. The GPM shall send the "feedback summary report generated" notification message to the accountant.

Postconditions

- The accountant has the feedback summary report.
- The feedback summary report shall contain the information specified in its associated data requirements.

Categorization

- **Volatility**: Medium

- **Frequency**: Low (Monthly)
- **Criticality**: Medium
- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.1.1.2 Normal Path: Fees Summary Report Generated

Path Requirement

The GPM shall enable accountants to generate fees summary reports.

Externals

- Accountant (Client)

Preconditions

- The GPM has identified and authenticated the accountant.

Interactions

4. The accountant requests a fees summary report for a specific month and year from the GPM.
5. The GPM shall send the fees summary report for the requested month and year to the accountant.
6. The GPM shall send the "fees summary report generated" notification message to the accountant.

Postconditions

- The accountant shall have the fees summary report.
- The fees summary report shall contain the information specified in its associated data requirements.

Categorization

- **Volatility**: Medium
- **Frequency**: Low (Monthly)
- **Criticality**: Medium
- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.1.1.3 Normal Path: Invoice Summary Report Generated

Path Requirement

The GPM shall enable accountants to generate invoice summary reports.

Externals

- Accountant (Client)

Preconditions

- The GPM has identified and authenticated the accountant.

Interactions

1. The accountant requests an invoice summary report for a specific month and year[1] from the GPM.
2. The GPM shall send the invoice summary report for the requested month and year to the accountant.
3. The GPM shall send the "invoice summary report generated" notification message to the accountant.

Postconditions

- The accountant shall have the invoice summary report.

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[1] The default is the current month and year.

- The invoice summary report shall contain the information specified in its associated data requirements.

Categorization

- **Volatility**: Medium
- **Frequency**: Low (Monthly)
- **Criticality**: Medium
- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.1.1.4   Normal Path: Listings Summary Report Generated

Path Requirement

The GPM shall enable accountants to generate listings summary reports.

Externals

- Accountant (Client)

Preconditions

- The GPM has identified and authenticated the accountant.

Interactions

1. The accountant requests a listings summary report for a specific month and year from the GPM.
2. The GPM shall send the listings summary report for the requested month and year to the accountant.
3. The GPM shall send the "listings summary report generated" notification message to the accountant.

Postconditions

- The accountant shall have the listings summary report.
- The listings summary report shall contain the information specified in its associated data requirements.

Categorization

- **Volatility**: Medium
- **Frequency**: Low (Monthly)
- **Criticality**: Medium
- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.1.1.5   Normal Path: User Summary Report Generated

Path Requirement

The GPM shall enable accountants to generate user summary reports.

Externals

- Accountant (Client)

Preconditions

- The GPM has identified and authenticated the accountant.

Interactions

1. The accountant requests a user summary report for a specific month and year[2] from the GPM.

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[2] The default is the current month and year.

2. The GPM shall send the user summary report for the requested month and year to the accountant.
3. The GPM shall send the "user summary report generated" notification message to the accountant.

Postconditions

- The accountant shall have the user summary report.

- The user summary report shall contain the information specified in its associated data requirements.

Categorization

- **Volatility**: Medium

- **Frequency**: Low (Monthly)

- **Criticality**: Medium

- **Probability of Defects**: Medium

- **Risk**: Medium

3.2.1.2 Use Case: Accountant Updates Fee Schedule

Use Case Requirement

The GPM shall enable accountants to update the schedule of fees to be paid by the sellers and proactive buyers.

Business Justification

- The GPM must enable the accountant to modify fees if GPM is to remain profitable in a competitive marketplace.

Requirements Trace

- AVS OG-AC-3) Update Fee Schedule

Use Case Paths

- Normal:
  - Fees Successfully Updated
- Exceptional:
  - Accountant Times Out
  - Invalid Fee

3.2.1.2.1 Normal Path: Fees Successfully Updated

Path Requirement

The GPM shall enable accountants to update the schedule of fees charged to sellers and proactive buyers.

Externals

- Accountant (Client)

Preconditions

- The GPM has identified and authenticated the accountant.

- Each of the fees in the fee schedule has a value in the associated valid range.

Interactions

1. The accountant sends a request to update the fee schedule to the GPM.
2. The GPM sends the current fee schedule containing the mandatory fees specified in the associated data requirements to the accountant.
3. The accountant updates some or all of these mandatory fees and sends them to the GPM.
4. The GPM shall send the "fees successfully updated" notification message to the accountant.

Postconditions

- The GPM shall store each original fee that was not updated.

- The GPM shall store each updated fee that is valid according to the constraints specified in the associated data requirements.

Categorization

- **Volatility**: Medium

- **Frequency**: Low

- **Criticality**: High

- **Probability of Defects**: Medium

- **Risk**: Medium

3.2.1.2.2 Exception Path: Accountant Times Out

Path Requirement

The GPM shall require that an accountant complete updating fees in the fee schedule within a reasonable time limit.

Externals

- Accountant (Client)

Preconditions

- The GPM has identified and authenticated the accountant.

- Each of the fees in the fee schedule has a value in the associated valid range.

Interactions

5. The accountant sends a request to update the fee schedule to the GPM.
6. The GPM shall send the current fee schedule containing the mandatory fees specified in the associated data requirements to the accountant.
7. The accountant updates some or all of these mandatory fees (whereby at least one fee is invalid) and sends them to the GPM.
8. The GPM shall send the "invalid fee detected" notification message to the accountant.

Postconditions

- The GPM shall store each original fee that was not updated.

- The GPM shall store each updated fee that is valid according to the constraints specified in the associated data requirements.

- The GPM shall store each original fee for which the requested updated fee was invalid.

Categorization

- **Volatility**: Medium

- **Frequency**: Low

- **Criticality**: High

- **Probability of Defects**: Medium

- **Risk**: Medium

3.2.1.2.3 Exception Path: Invalid Fee

Path Requirement

The GPM shall require that an accountant must ensure that every fee in the seller fee schedule has a valid value.

Externals

- Accountant (Client)

Preconditions

- The GPM has identified and authenticated the accountant.
- Each of the fees in the fee schedule has a value in the associated valid range.

Interactions

1. The accountant sends a request to update the fee schedule to the GPM.
2. The GPM shall send the current fee schedule containing the mandatory fees specified in the associated data requirements to the accountant.
3. The accountant fails to send the updated fees within the time limit to the GPM.
4. The GPM shall send the "time limit exceeded" notification message to the accountant.

Postconditions

- The GPM shall store each original fee.

Categorization

- **Volatility**: Low
- **Frequency**: Low
- **Criticality**: Medium
- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.1.3   Use Case: Accountant Updates User Restrictions

Use Case Requirement

The GPM shall enable accountants to set the limits on overdue bills and maximum account balances.

Business Justification

- The GPM must limit how much a seller can be overdue in payment if GPM is to remain profitable in a competitive marketplace.
- Sellers who have overdue bills can be prevented from registering auctions until their bills are paid.

Requirements Trace

- AVS OG-A-4) Accountant Updates Maximum Account Balance
- AVS OG-A-5) Accountant Updates Maximum Due Date

Use Case Paths

- Normal:
  - User Restrictions Successfully Updated
- Exceptional:
  - Accountant Times Out
  - Invalid User Restriction

3.2.1.3.1   Normal Path: User Restrictions Successfully Updated

Path Requirement

The GPM shall enable accountants to update user restrictions including the:

- Maximum Account Balance (i.e., the maximum amount due from a user before the user is prohibited from registering new listings)

- Maximum Past Due Limit (i.e., the maximum number of days when payments are past due from a user before the user is prohibited from registering new listings)

- Minimum Billing Balance (i.e., the minimum billing balance for a user before invoices are sent to them)

Externals

- Accountant (Client)

Preconditions

- The GPM displays a screen on the accountant's personal computer enabling the accountant to update the seller restrictions.

Interactions

1. The accountant sends an update user restrictions request to the GPM.
2. The GPM shall send the current user restrictions as specified in the associated data requirements to the accountant.
3. The accountant updates some or all of these user restrictions and sends them to the GPM.
4. The GPM shall send the "user restrictions updated" notification message to the accountant.
5. The GPM shall respond by displaying an update notification with the following information to the accountant:
   - The "Maximum Seller Account Balance Updated" message
   - The previous maximum seller account balance
   - The updated maximum seller account balance
6. The accountant acknowledges the update notification to the GPM.

Postconditions

- The GPM stores the new maximum account balance.

Categorization

- **Volatility**: Low

- **Frequency**: Low

- **Criticality**: Medium

- **Probability of Defects**: Medium

- **Risk**: Medium

3.2.1.3.2   Exception Path: Accountant Times Out

Path Requirement

The GPM shall prohibit accountants from taking longer than the timeout period to update seller restrictions on maximum account balances or maximum past due limits.

Externals

- Accountant (Client)

Preconditions

- The GPM displays a screen on the accountant's personal computer enabling the accountant to update the seller restrictions.

Interactions

1. If the accountant fails to send a request within the timeout period to the GPM, then the GPM shall respond by displaying a timeout notification with the following information to the accountant:
   - The "Timed Out" message

2. The accountant acknowledges the timeout notification to the GPM.

Postconditions

- None.

Categorization

- **Volatility**: Low
- **Frequency**: Low
- **Criticality**: Medium
- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.1.3.3 Exception Path: Invalid User Restriction

Path Requirement

The GPM shall prohibit accountants from setting an invalid maximum account balance.

Externals

- Accountant (Client)

Preconditions

- The GPM displays a screen on the accountant's personal computer enabling the accountant to update the seller restrictions.

Interactions

1. The accountant sends an update maximum account balance request containing the following information to the GPM:
   - Invalid Maximum Seller Account Balance (in US dollars)
2. The GPM shall respond by displaying an update failed notification with the following information to the accountant:
   - The "Invalid Maximum Seller Account Balance" message
   - The previous maximum seller account balance
   - The updated maximum seller account balance
3. The accountant acknowledges the update failed notification to the GPM.

Postconditions

- The GPM stores the previous maximum account balance.

Categorization

- **Volatility**: Low
- **Frequency**: Low
- **Criticality**: Medium
- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.2   Buyer

The subsection specifies the functional requirements primarily associated with buyers.

Definition

Buyer is the role played by any user who uses the GPM to attempt to buy one or more items being sold by a seller using the GPM.

Responsibilities

A buyer has the following responsibilities:

- Comply with the user agreement.
- Submit bids on items being sold at auctions.
- Buy items being sold at direct sales.
- Directly pay the seller for the item(s) purchased.
- Register feedback about sellers with the GPM.

Required Capabilities

A buyer needs the following required technical expertise, experience, and training to effectively interact with GPM:

- Use a personal computer to log onto and navigate a user-friendly website.

Use Case Diagrams
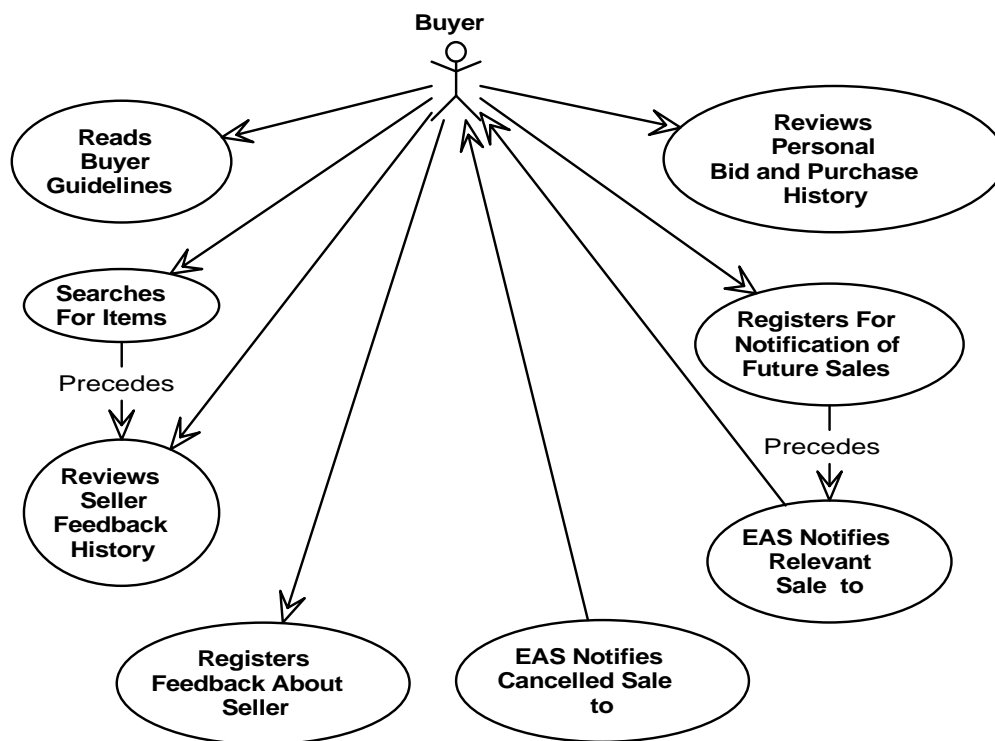
Figure 5: General Buyer Use Case Diagram
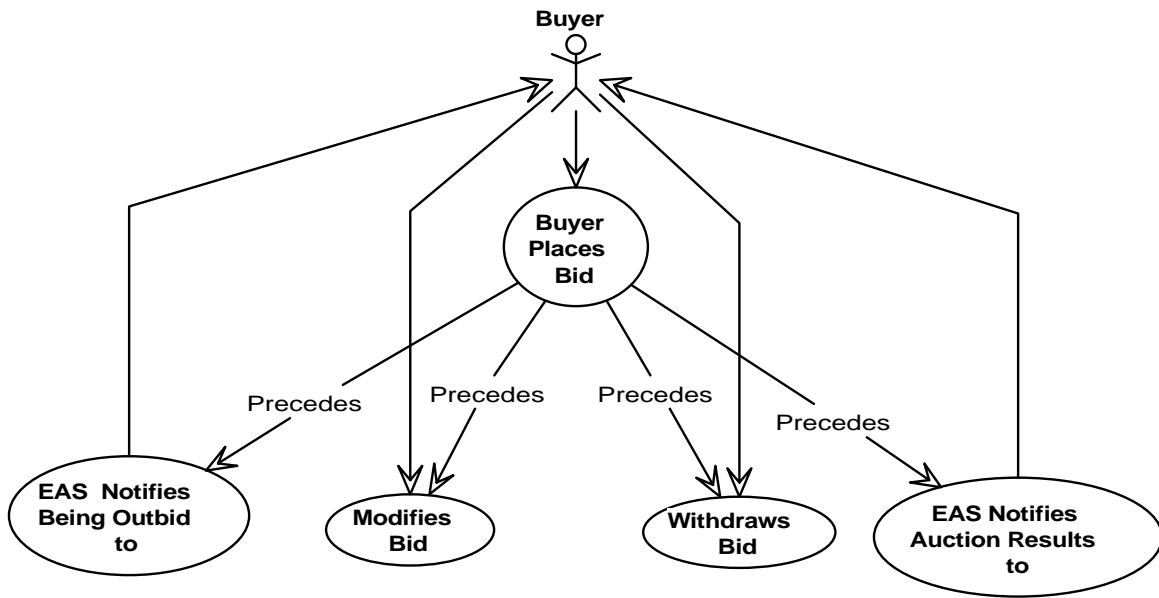
Figure 6: Auction-Specific Buyer Use Case Diagram
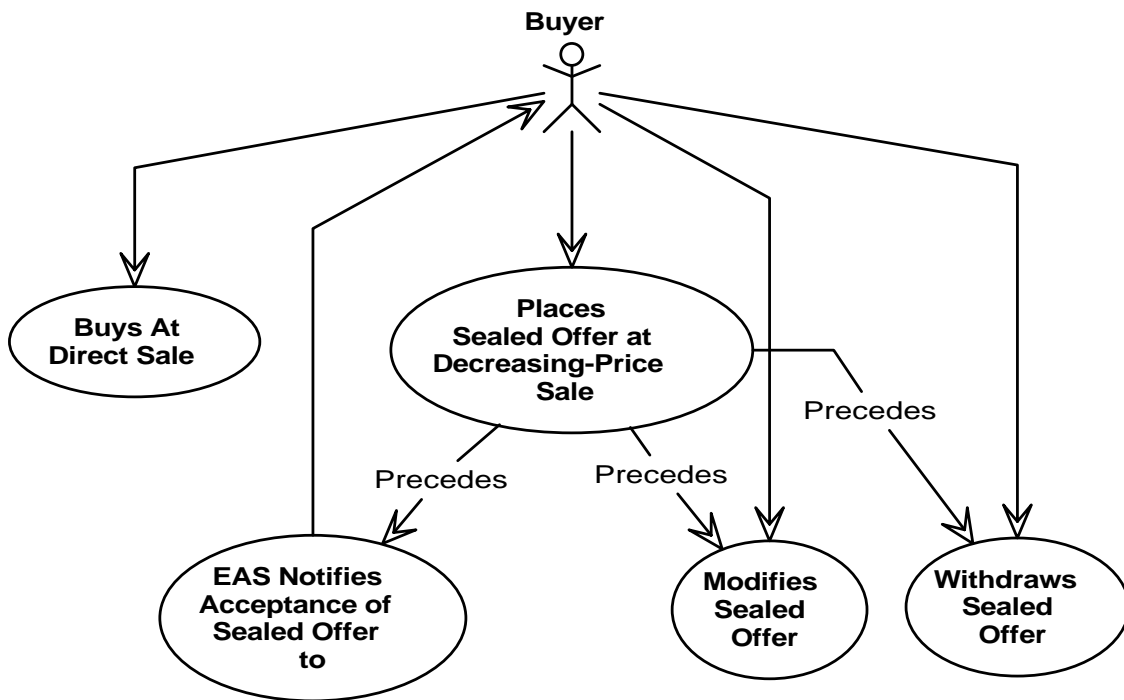
Figure 7: Direct Sale Buyer Use Case Diagram

Use Cases

- General Use Cases:
  - Buyer Reads Buyer Guidelines
  - Buyer Searches for Items
  - GPM Notifies Cancelled Sale to Buyer

- Buyer Reviews Personal Bid and Purchase History
- Buyer Reviews Seller Feedback History
- Buyer Registers Feedback about Seller
- Buyer Registers for Notification of Future Sales
- GPM Notifies Relevant Sale to Buyer
- Auction-Specific Use Cases:
  - Buyer Places Bid
  - GPM Notifies Being Outbid to Buyer
  - Buyer Modifies Bid
  - GPM Notifies Auction Results to Winning Buyer
  - Buyer Withdraws Bid
- Direct-Sale Use Cases:
  - Buyer Buys at Direct Sale
  - Buyer Places Sealed Offer at Decreasing Price Sale
  - Buyer Modifies Sealed Offer
  - GPM Notifies Acceptance of Sealed Offer to Buyer
  - Buyer Withdraws Sealed Offer

3.2.2.1 Use Case: Buyer Reads Buyer Guidelines

Use Case Requirement

The GPM shall enable buyers to read buyer guidelines.

Business Justification

- Buyers need to learn how to buy before deciding if they want to buy at a sale.

Requirements Trace

- AVS OG-B-1) Read Buyer Guidelines

Use Case Paths

- Normal:
  - Guidelines Read
- Exceptional:
  - None

3.2.2.1.1 Normal Path: Guidelines Read

Path Requirement

The GPM shall enable buyers to read the buyer guidelines.

Externals

- Buyer (Client)

Preconditions

- The GPM displays a webpage on the browser of the buyer's personal computer that enables the buyer to request the display of the buyer guidelines.

Interactions

1. The buyer sends a display buyer guidelines request to the GPM.
2. The GPM shall respond by displaying the buyer guidelines on the browser of the buyer's personal computer.

3. After reading the buyer instructions, the buyer signals completion to the GPM.

Postconditions

- None.

Categorization

- **Volatility**: Low
- **Frequency**: Medium
- **Criticality**: Medium
- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.2.2 Use Case: Buyer Searches for Items

Use Case Requirement

The GPM shall enable buyers to search for sales of items, which they wish to buy.

Business Justification

- Selection by:
  - Sale number enables buyers to quickly find the status of specific sales.
  - Category and/or keywords enable buyers to easily find items they wish to purchase.
  - Seller enables buyers to easily return to either favorite sellers or sellers who have sold similar items in the past.
- Restricting search results to:
  - Open sales permits buyers to identify new items that are currently available for sale.
  - New sales (sales opened within the previous 24 hours) permits buyers to identify any new items that they have not previously had the opportunity on which to bid.
  - Closing sales (sales closing within 2 hours) permits buyer snipping, which may allow them to avoid being outbid at auctions.
  - Closed sales (sales that have closed within the previous week) permits buyers to determine the current selling prices of similar items before buying.

Requirements Trace

- AVS OG-B-2) Search for Items - By Category
- AVS OG-B-3) Search for Items - By Item Keywords
- AVS OG-B-4) Search for Items - By Sale Number
- AVS OG-B-5) Search for Items - By Seller

Use Case Paths

- Normal:
  - Search by Category
  - Search by Keywords
  - Search by Sale Number
  - Search by Seller
- Exceptional:
  - Buyer Times Out
  - Search Unsuccessful and Search Again
  - Unsuccessful Search Prompts Request for Notification of Future Sale

3.2.2.2.1 Normal Path: Search by Category

Path Requirement

The GPM shall enable the buyer to search for items by category.

Externals

- Buyer (Client)

Preconditions

- The GPM displays a webpage on the browser of the buyer's personal computer that enables the buyer to search for an item by displaying the following information:
    - Search criteria (i.e., category, sale number, keyword, and seller)
    - Search restrictions (i.e., all sales, all open sales, all new sales, all closing sales, and all closed sales)
- There are sales selling items meeting the buyer's search criteria and search restrictions.

Interactions

1. The buyer selects a hierarchical decomposed category and sends a category selected notification with the following information to the GPM:
    - The selected category and its super categories
    - The selected search restrictions
2. The GPM shall respond by displaying a webpage containing the following information on the browser of the buyer's personal computer:
    - The "Search Succeeded" message
    - List of sales matching the search criteria and search restrictions including for each auction:
        - Item description
        - Current high bid
        - Time remaining until the auction closes
3. The buyer selects sale and sends a display sale request with the following information to the GPM:
    - The selected item
4. The GPM shall respond by displaying a webpage containing the following information on the browser of the buyer's personal computer:
    - Item Summary:
        - Item title
        - Item quantity
        - Sale number
        - Sale type
            - Auction (Yankee or Dutch) or Direct Sale (Fixed Price or Decreasing Price)
            - Private or Public
        - Item hierarchical categorization
        - Optional keywords
        - Seller identifier
        - Item location
    - If a direct sale, the following information:
        - The price
    - If an auction, the following bidding information:
        - Current high bid:
            - High buyer

- Whether the reserve bid has been met
- Minimum starting bid
- Minimum bid increment
- First bid
- Number of bids
- Time Left
    - Auction started
    - Auction ends
- Item Details:
    - Description
    - URL of picture
    - Acceptable buyer payment methods:
        - Money order/cashiers Check
        - Personal Check
        - Collect on Delivery (COD)
        - Credit Card (American Express, Discover, Visa, Master Card)
        - On-Line Escrow
    - Shipping responsibility and costs

Postconditions

- None.

Categorization

- **Volatility**: Medium
- **Frequency**: High
- **Criticality**: High
- **Probability of Defects**: Medium
- **Risk**: High

3.2.2.2.2 Normal Path: Search by Keywords

Path Requirement

The GPM shall enable the buyer to search for items by keywords.

Externals

- Buyer (Client)

Preconditions

- The GPM displays a webpage on the browser of the buyer's personal computer that enables the buyer to search for an item by displaying the following information:
    - Search criteria (i.e., category, sale number, keyword, and seller)
    - Search restrictions (i.e., all sales, all open sales, all new sales, all closing sales, and all closed sales)
- There are sales selling items matching the buyer's search criteria and search restrictions.

Interactions

1. The buyer uses the webpage to enter one or more keywords and send a keywords selected notification with the following information to the GPM:
    - The list of search keywords

- The search restrictions

2. The GPM shall respond by displaying a webpage containing the following information on the browser of the buyer's personal computer:
   - The "Search Succeeded" message
   - List of sales matching the search keywords (sorted by degree of match) and search restrictions including for each auction:
     - Item description
     - Degree of match with buyer's keywords
     - Current high bid
     - Time remaining until auction closes

3. The buyer uses the webpage to select a sale and send a display sale request with the following information to the GPM:
   - The selected sale

4. The GPM shall respond by displaying a webpage containing the following information on the browser of the buyer's personal computer:
   - Item Summary:
     - Item title
     - Item quantity
     - Sale number
     - Sale type
       - Auction (Yankee or Dutch) or Direct Sale (Fixed Price or Decreasing Price)
       - Private or Public
     - Item hierarchical categorization
     - Optional keywords
     - Seller identifier
     - Item location
   - If a direct sale, the following information:
     - The price
   - If an auction, the following bidding information:
     - Current high bid:
       - High buyer
       - Whether the reserve bid has been met
     - Minimum starting bid
     - Minimum bid increment
     - First bid
     - Number of bids
     - Time Left:
       - Auction started
       - Auction ends
   - Item Details:
     - Description
     - URL of picture
     - Acceptable buyer payment methods:
       - Money order/cashiers Check
       - Personal Check

- Collect on Delivery (COD)
- Credit Card (American Express, Discover, Visa, Master Card)
- On-Line Escrow
- Shipping responsibility and costs

Postconditions

- None.

Categorization

- **Volatility**: Medium
- **Frequency**: High
- **Criticality**: High
- **Probability of Defects**: Medium
- **Risk**: High

3.2.2.2.3   Normal Path: Search by Sale Number

Path Requirement

The GPM shall enable the buyer to search for a specific item by sale number.

Externals

- Buyer (Client)

Preconditions

- The GPM displays a webpage on the browser of the buyer's personal computer that enables the buyer to search for an item by displaying the following information:
    - Search criteria (i.e., category, sale number, keyword, and seller)
    - Search restrictions (i.e., all sales, all open sales, all new sales, all closing sales, and all closed sales)
- There is a sale matching the sale number.

Interactions

1. The buyer uses the webpage to select a specific sale and send a sale selected notification with the following information to the GPM:
    - The sale number
2. The GPM shall respond by displaying a webpage containing the following information on the browser of the buyer's personal computer:
    - Item Summary:
        - Item title
        - Item quantity
        - Sale number
        - Sale type
            - Auction (Yankee or Dutch) or Direct Sale (Fixed Price or Decreasing Price)
            - Private or Public
        - Item hierarchical categorization
        - Optional keywords
        - Seller identifier
        - Item location
    - If a direct sale, the following information:

- The price
- If an auction, the following bidding information:
    - Current high bid:
        - High buyer
        - Whether the reserve bid has been met
    - Minimum starting bid
    - Minimum bid increment
    - First bid
    - Number of bids
    - Time Left
        - Auction started
        - Auction ends
- Item Details:
    - Description
    - URL of picture
    - Acceptable buyer payment methods:
        - Money order/cashiers Check
        - Personal Check
        - Collect on Delivery (COD)
        - Credit Card (American Express, Discover, Visa, Master Card)
        - On-Line Escrow
    - Shipping responsibility and costs

Postconditions

- None.

Categorization

- **Volatility**: Medium
- **Frequency**: Medium
- **Criticality**: High
- **Probability of Defects**: Medium
- **Risk**: High

3.2.2.2.4 Normal Path: Search by Seller

Path Requirement

The GPM shall enable the buyer to search for items by seller.

Externals

- Buyer (Client)

Preconditions

- The GPM displays a webpage on the browser of the buyer's personal computer that enables the buyer to search for an item by displaying the following information:
    - Search criteria (i.e., category, sale number, keyword, and seller)
    - Search restrictions (i.e., all sales, all open sales, all new sales, all closing sales, and all closed sales)
- There are auctions selling items meeting the buyer's search criteria and search restrictions.

Interactions

1. The buyer selects a hierarchical decomposed category and sends a seller selected notification with the following information to the GPM:
   - The selected seller
   - The selected search restrictions
2. The GPM shall respond by displaying a webpage containing the following information on the browser of the buyer's personal computer:
   - The "Search Succeeded" message
   - List of sales matching the search criteria and search restrictions including for each auction:
     - Item description
     - Current high bid
     - Time remaining until auction closes
3. The buyer uses the webpage to select sale and send a display sale request with the following information to the GPM:
   - The selected item
4. The GPM shall respond by displaying a webpage containing the following information on the browser of the buyer's personal computer:
   - Item Summary:
     - Item title
     - Item quantity
     - Sale number
     - Sale type
       - Auction (Yankee or Dutch) or Direct Sale (Fixed Price or Decreasing Price)
       - Private or Public
     - Item hierarchical categorization
     - Optional keywords
     - Seller identifier
     - Item location
   - If a direct sale, the following information:
     - The price
   - If an auction, the following bidding information:
     - Current high bid:
       - High buyer
       - Whether the reserve bid has been met
     - Minimum starting bid
     - Minimum bid increment
     - First bid
     - Number of bids
     - Time Left
       - Auction started
       - Auction ends
   - Item Details:
     - Description
     - URL of picture
     - Acceptable buyer payment methods:

- – Money order/cashiers Check
- – Personal Check
- – Collect on Delivery (COD)
- – Credit Card (American Express, Discover, Visa, Master Card)
- – On-Line Escrow
- – Shipping responsibility and costs

Postconditions

- None.

Categorization

- **Volatility**: Medium
- **Frequency**: Low
- **Criticality**: High
- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.2.2.5 Exception Path: Buyer Times Out

Path Requirement

The GPM shall prohibit a buyer for taking longer than the timeout period to search for an item.

Externals

- Buyer (Client)

Preconditions

- The GPM displays a webpage on the browser of the buyer's personal computer that enables the buyer to search for an item by displaying the following information:
  - – Search criteria (i.e., category, sale number, keyword, and seller)
  - – Search restrictions (i.e., all sales, all open sales, all new sales, all closing sales, and all closed sales)

Interactions

1. If the buyer fails to make a selection within the timeout period and send an associated notification to the GPM, the GPM shall respond by displaying a webpage containing the following information on the browser of the buyer's personal computer:
   - – The "Timed Out" message
2. The buyer uses the webpage to send an acknowledgement of the time out to the GPM.

Postconditions

- None.

Categorization

- **Volatility**: Medium
- **Frequency**: Low
- **Criticality**: Medium
- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.2.2.6 Exception Path: Search Unsuccessful And Search Again

Path Requirement

The GPM shall notify the buyer when a search for an item is not successful, enabling the buyer to search again.

Externals

- Buyer (Client)

Preconditions

- The GPM displays a webpage on the browser of the buyer's personal computer that enables the buyer to search for an item by displaying the following information:
  – Search criteria (i.e., category, sale number, keyword, and seller)
  – Search restrictions (i.e., all sales, all open sales, all new sales, all closing sales, and all closed sales)
- There are no auctions selling items matching the buyer's search criteria and search restrictions.

Interactions

1. The buyer sends either a category selected or keywords selected notification to the GPM.
2. The GPM shall respond by displaying a webpage containing the following information on the browser of the buyer's personal computer:
   – The "Search Failed" message

Postconditions

- None

Categorization

- **Volatility**: Medium
- **Frequency**: Low
- **Criticality**: High
- **Probability of Defects**: Medium
- **Risk**: High

3.2.2.2.7 Exception Path: Unsuccessful Search Prompts Request for Notification of Future Sales

Path Requirement

The GPM shall notify the buyer when a search for an item is not successful, enabling the buyer to request notification of future sales that meet the search criteria and restrictions.

Externals

- Buyer (Client)

Preconditions

- The GPM displays a webpage on the browser of the buyer's personal computer that enables the buyer to search for an item by displaying the following information:
  – Search criteria (i.e., category, item number, keyword, and seller)
  – Search restrictions (i.e., all sales, all open sales, all new sales, all closing sales, and all closed sales)
- There are no auctions selling items matching the buyer's search criteria and search restrictions.

Interactions

1. The buyer selects a hierarchical decomposed category and sends a category selected notification with the following information to the GPM:
    - The selected search criteria
    - The selected search restrictions
2. The GPM shall respond by displaying a webpage containing the following information on the browser of the buyer's personal computer:
    - The "Search Failed" message
3. The buyer uses the webpage to send a notify future sales request to the GPM.
4. The GPM shall respond by opening a webpage on the browser of the buyer's personal computer enabling the buyer to register for notification of future sales.

Postconditions

- None.

Categorization

- **Volatility**: Medium

- **Frequency**: Low

- **Criticality**: High

- **Probability of Defects**: Medium

- **Risk**: High

3.2.2.3   Use Case: GPM Notifies Buyer of Cancelled Sale

Use Case Requirement

The GPM shall notify buyers of cancelled sales.

Business Justification

- Buyers expect to be informed if the sale they are attending is cancelled.

Requirements Trace

- AVS OG-B-TBD) TBD

Use Case Paths

- Normal:
    - Auction Cancelled when Buyer is Logged On
    - Auction Cancelled when Buyer is Not Logged On
    - Direct Sale Cancelled when Buyer is Logged On
- Exceptional:
    - None

3.2.2.3.1   Normal Path: Auction Cancelled when Buyer is Logged On

Path Requirement

The GPM shall immediately notify the bidder at an auction if the seller cancels the auction when the bidder is logged on.

Externals

- Buyer (Client)
- Seller (Client)

Preconditions

- The buyer is logged on.
- The buyer is a bidder at an open auction.
- The seller cancels the auction.

Interactions

5. Within 5 seconds, the GPM shall respond by displaying a webpage containing the following information on the browser of the buyer's personal computer:
   - The "Auction Cancelled" message

Postconditions

- None.

Categorization

- **Volatility**: Medium
- **Frequency**: Low
- **Criticality**: Medium
- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.2.3.2   Normal Path: Auction Cancelled when Buyer is Not Logged On

Path Requirement

The GPM shall notify the bidder at an auction by email if the seller cancels the auction when the bidder is not logged on.

Externals

- Buyer (Client)
- Seller (Client)

Preconditions

- The buyer is not logged on.
- The buyer is a bidder at an open auction.
- The seller cancels the auction.

Interactions

1. Within 1 minute, the GPM shall respond by sending an email containing the following information to the buyer:
   - The "Auction Cancelled" message
   - The Auction ID
   - The Item Description
   - The date and time that the auction was canceled

Postconditions

- None.

Categorization

- **Volatility**: Medium
- **Frequency**: Low
- **Criticality**: Medium

- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.2.3.3 Normal Path: Direct Sale Cancelled when Buyer is Logged On

Path Requirement

The GPM shall immediately notify the buyer at a direct sale if the seller cancels the sale when the buyer is logged on.

Externals

- Buyer (Client)
- Seller (Client)

Preconditions

- The buyer is logged on.
- The buyer is in the process of buying the item being sold.
- The seller cancels the direct sale.

Interactions

1. Within 5 seconds, the GPM shall respond by displaying a webpage containing the following information on the browser of the buyer's personal computer:
   - The "Direct Sale Cancelled" message

Postconditions

- None.

Categorization

- **Volatility**: Medium
- **Frequency**: Low
- **Criticality**: Medium
- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.2.4 Use Case: Buyer Reviews Personal History

Use Case Requirement

The GPM shall enable buyers to display a history of their personal transactions (bids, sealed offers, and purchases).

Business Justification

- Buyers want to know the status of their personal transactions.

Requirements Trace

- AVS OG-B-16) Review Personal History

Use Case Paths

- Normal:
  - Bid History Displayed
- Exceptional:
  - No Bid History

3.2.2.4.1 Normal Path: Bid History Displayed

Path Requirement

The GPM shall enable the buyer to display his/her bid history.

Externals

- Buyer (Client)

Preconditions

- The GPM displays a webpage on the browser of the buyer's personal computer enabling the buyer to request his or her bid history.
- The buyer has at least made one bid on at least one open auction within the previous 90 days.

Interactions

1. The buyer uses the webpage to send a display bid history request to the GPM.
2. The GPM shall respond by displaying a webpage containing the following information on the browser of the buyer's personal computer:
   - For each auction:
     - The auction status (open, closed, cancelled)
     - The type of auction (regular, reserve, Dutch)
     - The item number
     - The current high bid
     - The current high buyer
     - The type of bid (single bid, automatic proxy bid)
     - The bid amount
     - The desired quantity
     - For automatic proxy bids:
       - The bid increment
       - The maximum bid

Postconditions

- The GPM enables the buyer to navigate to either a selected sale or return to the previous webpage.

Categorization

- **Volatility**: Medium
- **Frequency**: Medium
- **Criticality**: High
- **Probability of Defects**: Medium
- **Risk**: High

3.2.2.4.2 Exceptional Path: No Bid History

Path Requirement

The GPM shall notify a buyer who has never bid that he/she has no bid history if the buyer tries to display the buyer's personal bid history.

Externals

- Buyer (Client)

Preconditions

- The GPM displays a webpage on the browser of the buyer's personal computer enabling the buyer to request his or her bid history.
- The buyer has not bid on any auction within the previous 90 days.

Interactions

1. The buyer requests the GPM to display the buyer's bid history.
2. The GPM shall respond by displaying the following information to the buyer:
   – The "No Bid History" message
3. The buyer sends a failure acknowledgement to the GPM.

Postconditions

- None.

Categorization

- **Volatility**: Medium
- **Frequency**: Low
- **Criticality**: Medium
- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.2.5 Use Case: Buyer Reviews Seller Feedback History

Use Case Requirement

The GPM shall enable buyers to review feedback about sellers made by winning buyers.

Business Justification

- Buyers may choose not to bid if sellers have a history of not delivering purchased items or delivering items that do not conform to the item descriptions at the auction.

Requirements Trace

- AVS OG-B-17) Review Seller Feedback History

Use Case Paths

- Normal:
  – Seller Feedback Reviewed
- Exceptional:
  – No Feedback Registered

3.2.2.5.1 Normal Path: Seller Feedback Reviewed

Path Requirement

The GPM shall enable a buyer to review the feedback history of the seller.

Externals

- Buyer (Client)

Preconditions

- The GPM displays a webpage on the browser of the buyer's personal computer (e.g., a webpage that displays a sale) that enables the buyer to request the seller's feedback history.
- The seller has feedback in his/her feedback history.

Interactions

1. The buyer uses the webpage to send a review seller's feedback history request to the GPM.
2. The GPM shall respond by displaying a webpage containing the following information on the browser of the buyer's personal computer:
   - The seller's alias and identifier
   - The number of comments
   - A table summarizing comments by:
     - Type (Positive, Neutral, Negative, Total)
     - When made (Past week, past month, past 6 months)
   - A table documenting each comment:
     - The winning buyer's alias and identifier
     - The date and time of the comment
     - The type of comment (Positive, Neutral, Negative)
     - The comment

Postconditions

- The buyer may add feedback about the seller.

Categorization

- **Volatility**: Medium
- **Frequency**: High
- **Criticality**: Medium
- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.2.5.2 Exceptional Path: No Feedback Registered

Path Requirement

The GPM shall notify a buyer when the seller does not have a feedback history.

Externals

- Buyer (Client)

Preconditions

- The GPM displays a webpage on the browser of the buyer's personal computer (e.g., a webpage that displays a sale) that enables the buyer to request the seller's feedback history.
- The seller has no feedback history.

Interactions

1. The buyer uses the webpage to send a review seller's feedback history request to the GPM.
2. The GPM shall respond by displaying a webpage containing the following information on the browser of the buyer's personal computer:
   - The seller's alias and identifier
   - The number of comments = 0.
   - A table summarizing comments by:
     - Type (Positive = 0, Neutral = 0, Negative = 0, Total = 0)
     - When made (Past week, past month, past 6 months)
   - An *empty* table documenting each comment:
     - The winning buyer's alias and identifier

- – The date and time of the comment
- – The type of comment (Positive, Neutral, Negative)
- – The comment

Postconditions

- None.

Categorization

- **Volatility**: Medium

- **Frequency**: High

- **Criticality**: Medium

- **Probability of Defects**: Medium

- **Risk**: Medium

3.2.2.6 Use Case: Buyer Registers Feedback about Seller

Use Case Requirement

The GPM shall enable winning buyers to register feedback about the sellers of the items they buy.

Business Justification

- Buyers want to register complaints against sellers who do not deliver purchased items or sellers who deliver items that do not conform to the item descriptions at the auction.

Requirements Trace

- AVS OG-B-18) Register Feedback about Seller

Use Case Paths

- Normal:
  - – Feedback registered
- Exceptional:
  - – None

3.2.2.6.1 Normal Path: Feedback Registered

Path Requirement

The GPM shall enable each winning buyer to register feedback concerning the seller.

Externals

- Buyer (Client)

Preconditions

- The GPM displays a webpage on the browser of the buyer's personal computer containing the following information enabling the buyer to register feedback about the seller:
  - – The "Register Seller Feedback" message
  - – The following output fields:
    - – The winning buyer's alias
    - – The date and time of the comment
    - – The seller's alias
    - – The sale identifier
    - – The item title

- – The following input fields:
    - – The type of comment (Positive, Neutral, Negative)
    - – The comment
- The buyer has bought one or more items from the seller at the sale.

Interactions

1. The buyer uses the webpage to send an update seller's feedback history request containing the following information to the GPM:
    - – The type of comment (Positive, Neutral, Negative)
    - – The comment
2. The GPM shall respond by displaying a webpage containing the following information on the browser of the buyer's personal computer:
    - – The "Seller Feedback History Updated" message
3. The buyer uses the webpage to acknowledge the entering of the seller feedback to the GPM.

Postconditions

- The GPM stores the buyer's feedback about the seller in the seller's feedback history.

Categorization

- **Volatility**: Medium
- **Frequency**: Low
- **Criticality**: Medium
- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.2.7 Use Case: Buyer Registers for Notification of Future Sales

Use Case Requirement

The GPM shall enable buyers to register for email notification of future sales that match their search criteria.

Business Justification

- Buyers would like to be notified if some future sale is selling items in which they are interested.

Requirements Trace

- AVS OG-B-19) Register for Notification of Future Sales – By Category
- AVS OG-B-20) Register for Notification of Future Sales – By Keywords
- AVS OG-B-21) Register for Notification of Future Sales – By Seller

Use Case Paths

- Normal:
    - – Search by Item Categories
    - – Search by Keywords
    - – Search by Sellers
- Exceptional:
    - – None

3.2.2.7.1 Normal Path: Search by Item Categories

Path Requirement

The GPM shall enable buyers to register for notification of future sales that sell items matching their selected item categories.

Externals

- Buyer (Client)

Preconditions

- The GPM displays a webpage on the browser of the buyer's personal computer enabling the buyer to register for notification of future sales.

Interactions

1. The GPM shall display the following information on the browser of the buyer's personal computer:
   - The "Register for Notification" message
   - The search criteria (i.e., item categories, search keywords, seller list).
   - The search type (e.g., all sales, all auctions, Dutch auctions, Yankee auctions, all direct sales, fixed-price sales, decreasing-price sales)
   - The duration of the notification request (default = one month)
2. The buyer requests notification of future sales by sending the following information to the GPM:
   - The selected item categories
   - The selected search type
   - The duration of the notification request
3. The GPM shall respond by displaying the following information of the buyer's personal computer:
   - The "Notification Request Registered"
   - The selected item categories
   - The selected search type
   - The duration of the notification request
4. The buyer acknowledges the notification request to the GPM.

Postconditions

- The GPM registers the buyer's request for notification including the following information:
   - The buyer's identifier
   - The selected item categories
   - The selected search type
   - The start date of the request for notification
   - The end date of the request for notification

Categorization

- **Volatility**: Medium
- **Frequency**: Low
- **Criticality**: Medium
- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.2.7.2 Normal Path: Search by Keywords

Path Requirement

The GPM shall enable buyers to register for notification of future sales that sell items matching their keywords.

Externals

- Buyer (Client)

Preconditions

- The GPM displays a webpage on the browser of the buyer's personal computer enabling the buyer to register for notification of future sales.

Interactions

1. The GPM shall display the following information on the browser of the buyer's personal computer:
   - The "Register for Notification" message
   - The search criteria (i.e., item categories, search keywords, seller list).
   - The search type (e.g., all sales, all auctions, Dutch auctions, Yankee auctions, all direct sales, fixed-price sales, decreasing-price sales)
   - The duration of the notification request (default = one month)
2. The buyer requests notification of future sales by sending the following information to the GPM:
   - The entered keywords
   - The selected search type
   - The duration of the notification request
3. The GPM shall respond by displaying the following information of the buyer's personal computer:
   - The "Notification Request Registered"
   - The entered keywords
   - The selected search type
   - The duration of the notification request
4. The buyer acknowledges the notification request to the GPM.

Postconditions

- The GPM registers the buyer's request for notification including the following information:
   - The buyer's identifier
   - The buyer's keywords
   - The selected search type
   - The start date of the request for notification
   - The end date of the request for notification

Categorization

- **Volatility**: Medium
- **Frequency**: Low
- **Criticality**: Medium
- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.2.7.3 Normal Path: Search by Sellers

Path Requirement

The GPM shall enable buyers to register for notification of future sales that sell items matching their selected sellers.

Externals

- Buyer (Client)

Preconditions

- The GPM displays a webpage on the browser of the buyer's personal computer enabling the buyer to register for notification of future sales.

Interactions

1. The GPM shall display the following information on the browser of the buyer's personal computer:
   - The "Register for Notification" message
   - The search criteria (i.e., item categories, search keywords, seller list).
   - The search type (e.g., all sales, all auctions, Dutch auctions, Yankee auctions, all direct sales, fixed-price sales, decreasing-price sales)
   - The duration of the notification request (default = one month)
2. The buyer requests notification of future sales by sending the following information to the GPM:
   - The selected sellers
   - The selected search type
   - The duration of the notification request
3. The GPM shall respond by displaying the following information of the buyer's personal computer:
   - The "Notification Request Registered"
   - The selected sellers
   - The selected search type
   - The duration of the notification request
4. The buyer acknowledges the notification request to the GPM.

Postconditions

- The GPM registers the buyer's request for notification including the following information:
   - The buyer's identifier
   - The selected sellers
   - The selected search type
   - The start date of the request for notification
   - The end date of the request for notification

Categorization

- **Volatility**: Medium
- **Frequency**: Low
- **Criticality**: Medium
- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.2.8   Use Case: GPM Notifies Buyer of Relevant Sale

Use Case Requirement

The GPM shall notify buyers when an auction that matches their registered criteria opens.

Business Justification

- Buyers would like to be notified when some future sale sales the items that they are interested in.

Requirements Trace

- AVS OG-B-19) Register for Notification of Future Sales – By Category
- AVS OG-B-20) Register for Notification of Future Sales – By Keywords
- AVS OG-B-21) Register for Notification of Future Sales – By Seller

Use Case Paths

- Normal:
  - Buyer Notified When Logged On
  - Buyer Notified When Not Logged On
- Exceptional:
  - Buyer Account Deleted

3.2.2.8.1   Normal Path: Buyer Notified when Logged On

Path Requirement

The GPM shall notify registered buyers when a sale that matches their registered criteria opens.

Externals

- Buyer (Server)

Preconditions

- A sale matching the buyer's search criteria has just opened.
- The buyer has a current user account.

Interactions

1. The GPM shall send an email containing the following information to the buyer:
   - The "Relevant Auction Opened" message
   - The buyer's name
   - The buyer's alias
   - The auction number
   - The auction type (Regular, Reserve, Dutch)
   - The auction's closing date and time
   - The item title
   - The current high bid
   - The buyer's search technique (search criteria and restrictions, keywords, or seller)
   - The date the buyer requested notification

Postconditions

- The GPM has sent a notification email to the buyer who registered for notification of future auctions.

Categorization

- **Volatility**: High
- **Frequency**: Medium

- **Criticality**: Medium
- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.2.8.2   Normal Path: Buyer Notified when Not Logged On

TBD

3.2.2.8.3   Exceptional Path: Buyer Account Deleted

Path Requirement

The GPM shall not notify buyers who have deleted their user accounts when a relevant auction opens.

Externals

- Buyer (Server)

Preconditions

- An auction matching the buyer's search criteria has just opened.
- The buyer has a deleted user account.
- The auction is not closed.

Interactions

1. None

Postconditions

- None.

Categorization

- **Volatility**: Low
- **Frequency**: Low
- **Criticality**: Low
- **Probability of Defects**: Low
- **Risk**: Low

3.2.2.9   Use Case: Buyer Places Bid On Item

Use Case Requirement

The GPM shall enable buyers to place a bid on an item at an auction.

Business Justification

- Buyers must place bids on items to win auctions.

Requirements Trace

- AVS OG-B-6) Place Bid on Item – Single Bidding
- AVS OG-B-7) Place Bid on Item – Automatic Proxy Bidding
- AVS OG-B-8) Place Bid on Item – Minimum Starting Bid
- AVS OG-B-9) Place Bid on Item – Minimum Bid Increment

Use Case Paths

- Normal:
  - Single bid placed
  - Automatic proxy bid placed

－   Instant win price bid
- Exceptional:
   － Bid below minimum bid
   － Bid below minimum bid increment
   － Excessive quantity requested
   － Auction is closed

3.2.2.9.1   Normal Path: Single Bid Placed

Path Requirement

The GPM shall enable a buyer to place a new bid on an item if the auction is not closed.

Externals

- Buyer (Client)

Preconditions

- The GPM displays a webpage enabling the buyer to either review the seller's feedback history or to request placing a bid on the browser of the buyer's personal computer.
- The required quantity of items is being auctioned.
- The auction is not closed.

Interactions

1. Optionally, invoke the use case "Buyer Reviews Seller Feedback History".
2. The buyer notifies the GPM that he/she wants to place a bid.
3. The GPM shall respond by requesting the following information from the buyer:
   － The type of bid (single bid, automatic proxy bid)
   － For single bids:
      － The bid amount
      － The desired quantity
   － For automatic proxy bids:
      － The initial bid amount
      － The desired quantity
      － The bid increment
      － The maximum bid
4. The buyer sends a submit bid request with the following information to the GPM:
   － The type of bid (single)
   － The bid amount
   － The desired quantity
5. The GPM shall respond by sending a notification containing the following information to the buyer:
   － The "Single Bid Placed" message
   － The bid amount
   － The desired quantity
6. The buyer sends a notification acknowledgement to the GPM.

Postconditions

- The GPM stores the new bid on the item in the auction:
   － The auction
   － The buyer

- The date and time of the bid
- The type of bid as normal
- The bid amount
- The desired quantity

Categorization

- **Volatility**: Medium
- **Frequency**: High
- **Criticality**: High
- **Probability of Defects**: Medium
- **Risk**: High

3.2.2.9.2 Normal Path: Automatic Proxy Bid Placed

Path Requirement

The GPM shall enable a buyer to place a new bid on an item if the auction is not closed.

Externals

- Buyer (Client)

Preconditions

- The GPM displays the "Auction Description" webpage on the browser of the buyer's personal computer.
- The required quantity of items is being auctioned.
- The auction is not closed.

Interactions

1. Optionally, execute the use case "Buyer Reviews Seller Feedback History".
2. The buyer uses the "Auction Description" webpage to send a "Place Bid" request to the GPM.
3. The GPM shall respond by displaying the "Place Bid" webpage containing the following information on the browser of the buyer's personal computer:
   - The type of bid (single bid, automatic proxy bid)
   - For single bids:
     - The bid amount
     - The desired quantity
   - For automatic proxy bids:
     - The initial bid amount
     - The desired quantity
     - The bid increment
     - The maximum bid
4. The buyer uses the "Place Bid" webpage to enter the following information and send a "Submit Automatic Proxy Bid" request with the following information to the GPM:
   - The type of bid (automatic proxy)
     - The initial bid amount
     - The desired quantity
     - The bid increment
     - The maximum bid

5. The GPM shall respond by displaying the "Bid Placed" webpage containing the following information on the browser of the buyer's personal computer:
    – The "Automatic Proxy Bid Placed" message
    – The initial bid amount
    – The desired quantity
    – The bid increment
    – The maximum bid
6. The buyer uses the "Bid Placed" webpage to acknowledge the placing of the bid to the GPM.

Postconditions

- The GPM stores the new bid on the item in the auction:
    – The auction
    – The buyer
    – The date and time of the bid
    – The type of bid as automatic proxy
    – The initial bid amount
    – The desired quantity
    – The bid increment
    – The maximum bid
- The GPM displays the "Search Results" webpage on the browser of the buyer's personal computer.

Categorization

- **Volatility**: Medium
- **Frequency**: High
- **Criticality**: High
- **Probability of Defects**: Medium
- **Risk**: High

3.2.2.9.3   Normal Path: Instant Win Price Bid

3.2.2.9.4   Exceptional Path: Bid Below Minimum Bid

Path Requirement

The GPM shall prohibit a buyer from placing a new bid on an item if the bid is below the minimum bid.

Externals

- Buyer (Client)

Preconditions

- The GPM displays the "Auction Description" webpage on the browser of the buyer's personal computer.
- The required quantity of items is being auctioned.
- The auction is not closed.

Interactions

1. Optionally, execute the use case "Buyer Reviews Seller Feedback History".
2. The buyer uses the "Auction Description" webpage to send a "Place Bid" request to the GPM.
3. The GPM shall respond by displaying the "Place Bid" webpage containing the following information on the browser of the buyer's personal computer:

 − The type of bid (single bid, automatic proxy bid)
 − For single bids:
    − The bid amount
    − The desired quantity
 − For automatic proxy bids:
    − The initial bid amount
    − The desired quantity
    − The bid increment
    − The maximum bid

4. The buyer uses the "Place Bid" webpage to enter the following information and send a "Submit Automatic Proxy Bid" request with the following information to the GPM:
 − A bid amount that is below the current minimum bid.

5. The GPM shall respond by displaying the "Bid Failed" webpage containing the following information on the browser of the buyer's personal computer:
 − The "Bid Below Minimum Bid" message
 − The current high bid amount
 − The buyer's bid

6. The buyer uses the "Bid Failed" webpage to acknowledge the failure of the bid to the GPM.

Postconditions

- The GPM does not store the new bid on the item in the auction.

- The GPM displays the "Place Bid" webpage on the browser of the buyer's personal computer.

- The GPM displays the "Auction Description" webpage on the browser of the buyer's personal computer.

Categorization

- **Volatility**: Medium

- **Frequency**: Low

- **Criticality**: High

- **Probability of Defects**: Medium

- **Risk**: High

3.2.2.9.5 Exceptional Path: Bid Below Minimum Bid Increment

Path Requirement

The GPM shall prohibit a buyer from placing a new bid on an item if the new bid is not at least the minimum bid increment above the current highest bid.

Externals

- Buyer (Client)

Preconditions

- The GPM displays the "Auction Description" webpage on the browser of the buyer's personal computer.

- The required quantity of items is being auctioned.

- The auction is not closed.

Interactions

1. Optionally, execute the use case "Buyer Reviews Seller Feedback History".

2. The buyer uses the "Auction Description" webpage to send a "Place Bid" request to the GPM.
3. The GPM shall respond by displaying the "Place Bid" webpage containing the following information on the browser of the buyer's personal computer:
    – The type of bid (single bid, automatic proxy bid)
    – For single bids:
        – The bid amount
        – The desired quantity
    – For automatic proxy bids:
        – The initial bid amount
        – The desired quantity
        – The bid increment
        – The maximum bid
4. The buyer uses the "Place Bid" webpage to enter the following information and send a "Submit Automatic Proxy Bid" request with the following information to the GPM:
    – A bid amount that does not exceed the current minimum bid by the minimum bid increment.
5. The GPM shall respond by displaying the "Bid Failed" webpage containing the following information on the browser of the buyer's personal computer:
    – The "Bid Below Minimum Bid Increment" message
    – The current high bid amount
    – The minimum bid increment
    – The minimum valid amount of the buyer's bid
    – The actual buyer's bid
6. The buyer uses the "Bid Failed" webpage to acknowledge the failure of the bid to the GPM.

Postconditions

- The GPM does not store the new bid on the item in the auction.
- The GPM displays the "Place Bid" webpage on the browser of the buyer's personal computer.
- The GPM displays the "Auction Description" webpage on the browser of the buyer's personal computer.

Categorization

- **Volatility**: Medium
- **Frequency**: Low
- **Criticality**: High
- **Probability of Defects**: Medium
- **Risk**: High

3.2.2.9.6 Exceptional Path: Excessive Quantity Desired

Path Requirement

The GPM shall prohibit a buyer from placing a bid for more items than are being auctioned.

Externals

- Buyer (Client)

Preconditions

- The GPM displays the "Auction Description" webpage on the browser of the buyer's personal computer.

- The desired quantity of items exceeds that being auctioned.
- The auction is not closed.

Interactions

1. Optionally, execute the use case "Buyer Reviews Seller Feedback History".
2. The buyer uses the "Auction Description" webpage to send a "Place Bid" request to the GPM.
3. The GPM shall respond by displaying the "Place Bid" webpage containing the following information on the browser of the buyer's personal computer:
   - The type of bid (single bid, automatic proxy bid)
   - For single bids:
     - The bid amount
     - The desired quantity
   - For automatic proxy bids:
     - The initial bid amount
     - The desired quantity
     - The bid increment
     - The maximum bid
4. The buyer uses the "Place Bid" webpage to enter the following information and send a "Submit Bid" request with the following information to the GPM:
   - A desired quantity that exceeds that being auctioned.
5. The GPM shall respond by displaying the "Bid Failed" webpage containing the following information on the browser of the buyer's personal computer:
   - The "Excessive Quantity Required" message
   - The number of items being auctioned
   - The buyer's requested number of items
6. The buyer uses the "Bid Failed" webpage to acknowledge the failure of the bid to the GPM.

Postconditions

- The GPM does not store the new bid on the item in the auction.

Categorization

- **Volatility**: Medium
- **Frequency**: Low
- **Criticality**: High
- **Probability of Defects**: Medium
- **Risk**: High

3.2.2.9.7 Exceptional Path: Auction is Closed

Path Requirement

The GPM shall prohibit a buyer from placing a new bid on an item if the auction is closed.

Externals

- Buyer (Client)

Preconditions

- The GPM displays the "Auction Description" webpage on the browser of the buyer's personal computer.
- The auction is closed.

Interactions

1. Optionally, execute the use case "Buyer Reviews Seller Feedback History".
2. The buyer uses the "Auction Description" webpage to send a "Place Bid" request to the GPM.
3. The GPM shall respond by displaying the "Bid Failed" webpage containing the following information on the browser of the buyer's personal computer:
   – The "Auction Closed" message
4. The buyer uses the "Bid Failed" webpage to acknowledge the failure of the bid to the GPM.

Postconditions

- The GPM does not store the new bid on the item in the auction.

Categorization

- **Volatility**: Medium
- **Frequency**: Low
- **Criticality**: High
- **Probability of Defects**: Medium
- **Risk**: High

3.2.2.10 Use Case: GPM Notifies Buyer of Being Outbid

Use Case Requirement

The GPM shall notify buyers if they are outbid at an auction.

Business Justification

- Buyers may wish to increase their bid in order to win the auction.

Requirements Trace

- AVS OG-B-10) Notify Buyers when Outbid

Use Case Paths

- Normal:
  – Buyer Notified
- Exceptional:
  – Buyer account deleted

3.2.2.10.1 Normal Path: Buyer Notified

Path Requirement

The GPM shall notify registered buyers if they are outbid at an auction.

Externals

- Buyer (Server)

Preconditions

- The buyer's winning bid was just outbid[3]:
  – For regular and reserve auctions, a buyer is outbid if another buyer has placed a higher bid than the buyer.

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[3] For each individual bid, a buyer is notified at most once when outbid. Additional competing bids that also win over the previous bid do not require separate warning emails.

− For Dutch auctions, a buyer is outbid if the total quantity of items being auctioned have been bid on by other buyers who have placed either:
  − Higher bids than the buyer.
  − Earlier bids of the same amount as the buyer.

- The buyer has a current user account.

- The auction is not closed.

- The buyer's maximum automatic proxy bid (if any) has been reached.

Interactions

1. The GPM shall send an email containing the following information to the buyer:
   − The "Outbid" message
   − The auction number
   − The item title
   − The buyer's bid
   − The current high bid
   − The auction's closing date and time

Postconditions

- The GPM has sent a notification email to the buyer who was outbid.

Categorization

- **Volatility**: High

- **Frequency**: High

- **Criticality**: Medium

- **Probability of Defects**: High

- **Risk**: High

3.2.2.10.2 Exceptional Path: Buyer Account Deleted

Path Requirement

The GPM shall not notify buyers who have deleted their user account when they are outbid at an auction.

Externals

- Buyer (Server)

Preconditions

- The buyer's winning bid was just outbid.

- The buyer has a deleted user account.

- The auction is not closed.

Interactions

1. None

Postconditions

- None.

Categorization

- **Volatility**: Low

- **Frequency**: Low

- **Criticality**: Low
- **Probability of Defects**: High
- **Risk**: Medium

3.2.2.11 Use Case: Buyer Modifies Bid On Item

Use Case Requirement

The GPM shall enable buyers to modify their bid on an item at an open auction.

Business Justification

- Buyers must be able to increase their bids to beat other bids.
- Buyers may choose to withdraw their bids.

Requirements Trace

- AVS OG-B-11) Modify Bid on Item – Starting Bid
- AVS OG-B-12) Modify Bid on Item – Automatic Proxy Bid Increment
- AVS OG-B-13) Modify Bid on Item – Maximum Automatic Proxy Bid
- AVS OG-B-14) Modify Bid on Item – Withdraw Bid

Use Case Paths

- Normal:
    - Automatic proxy bid modified
    - Bid withdrawn
- Exceptional:
    - Auction is closed
    - Bid Increment is below minimum
    - Excessive quantity desired
    - Maximum bid is below minimum bid

3.2.2.11.1 Normal Path: Automatic Proxy Bid Modified

Path Requirement

The GPM shall enable a buyer to modify his/her existing bid on an item if the auction is not closed.

Externals

- Buyer (Client)

Preconditions

- The GPM displays the "Search Results" webpage on the browser of the buyer's personal computer.
- The GPM displays the "Auction Description" webpage on the browser of the buyer's personal computer.
- The buyer has an active automatic proxy bid on the item being auctioned.
- The auction is not closed.

Interactions

1. Optionally, execute the use case "Buyer Reviews Seller Feedback History".
2. The buyer uses the "Auction Description" webpage to send an "Update Automatic Proxy" request to the GPM.
3. The GPM shall respond by displaying the "Update Automatic Proxy" webpage containing the following information on the browser of the buyer's personal computer:

- The type of bid (automatic proxy bid)
- The desired quantity of items
- The initial bid amount (showing the current value)
- The bid increment (showing the current value)
- The maximum bid (showing the current value)

4. The buyer uses the "Update Automatic Proxy" webpage to enter the following information and send a "Submit Automatic Proxy Bid" request with the following information to the GPM:
   - The type of bid (automatic proxy)
   - The desired quantity of items (possibly updated)
   - The bid increment (possibly updated)
   - The maximum bid (possibly updated)

5. The GPM shall respond by displaying the "Automatic Proxy Updated" webpage containing the following information on the browser of the buyer's personal computer:
   - The "Automatic Proxy Bid Updated" message
   - The original desired quantity
   - The new desired quantity
   - The original bid increment
   - The new bid increment
   - The original maximum bid
   - The new maximum bid

6. The buyer uses the "Automatic Proxy Updated" webpage to acknowledge the placing of the bid to the GPM.

Postconditions

- The GPM stores the updated automatic proxy bid on the item in the auction including:
  - The new bid increment
  - The new maximum bid
- The GPM displays the "Search Results" webpage on the browser of the buyer's personal computer.

Categorization

- **Volatility**: Medium
- **Frequency**: Medium
- **Criticality**: Medium
- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.2.11.2 Normal Path: Bid Withdrawn

Path Requirement

The GPM shall enable a buyer to withdraw an existing bid on an item if the auction is not closed.

Externals

- Buyer (Client)

Preconditions

- The GPM displays the "Search Results" webpage on the browser of the buyer's personal computer.
- The GPM displays the "Auction Description" webpage on the browser of the buyer's personal computer.

- The buyer has placed a bid on the item being auctioned.
- The auction is not closed.

Interactions

1. Optionally, execute the use case "Buyer Reviews Seller Feedback History".
2. The buyer uses the "Auction Description" webpage to send a "Withdraw Bid" request to the GPM.
3. The GPM shall respond by displaying the "Withdraw Bid" webpage containing the following information on the browser of the buyer's personal computer:
   − The auction identifier
   − The item title
   − The bid amount
   − The bid date and time
   − The bid increment (if an automatic proxy bid)
   − The maximum bid (if an automatic proxy bid)
4. The buyer uses the "Withdraw Bid" webpage to send a "Withdraw Bid" request to the GPM.
5. The GPM shall respond by displaying the "Bid Withdrawn" webpage containing the following information on the browser of the buyer's personal computer:
   − The "Bid Withdrawn" message
   − The auction identifier
   − The item title
   − The bid amount
   − The bid date and time
   − The bid increment (if an automatic proxy bid)
   − The maximum bid (if an automatic proxy bid)
6. The buyer uses the "Bid Withdrawn" webpage to acknowledge the withdrawal of the bid to the GPM.

Postconditions

- The GPM no longer stores the bid and buyer on the item in the auction.
- The GPM displays the "Search Results" webpage on the browser of the buyer's personal computer.

Categorization

- **Volatility**: Medium
- **Frequency**: Low
- **Criticality**: High
- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.2.11.3 Exceptional Path: Auction is Closed

Path Requirement

The GPM shall prohibit a buyer from modifying his/her existing bid on an item if the auction is closed.

Externals

- Buyer (Client)

Preconditions

- The GPM displays the "Auction Description" webpage on the browser of the buyer's personal computer.
- The buyer has placed a bid on the item being auctioned.

- The auction is closed.

Interactions

1. The buyer uses the "Auction Description" webpage to send a "Withdraw Bid" request to the GPM.
2. The GPM shall respond by displaying the "Bid Withdrawal Failed" webpage containing the following information on the browser of the buyer's personal computer:
    - The "Auction Closed" message
    - The auction identifier
    - The item title
    - The date and time that the auction closed.
3. The buyer uses the "Bid Withdrawal Failed" webpage to acknowledge the failure of the bid to the GPM.

Postconditions

- The GPM stores a record of the buyer's bids on the item being auctioned.

Categorization

- **Volatility**: Medium
- **Frequency**: Low
- **Criticality**: High
- **Probability of Defects**: Medium
- **Risk**: High

3.2.2.11.4 Exceptional Path: Bid Increment is Below Minimum

Path Requirement

The GPM shall prohibit a buyer from modifying his/her existing automatic proxy bid if the new bid increment is less than the minimum bid increment set by the seller.

Externals

- Buyer (Client)

Preconditions

- The GPM displays the "Auction Description" webpage on the browser of the buyer's personal computer.
- The buyer has placed an automatic proxy bid on the item being auctioned.
- The auction is open.
- The buyer's new bid increment is less than the minimum bid increment set by the seller.

Interactions

1. The buyer uses the "Auction Description" webpage to send an "Update Automatic Proxy" request to the GPM.
2. The GPM shall respond by displaying the "Update Automatic Proxy" webpage containing the following information on the browser of the buyer's personal computer:
    - The type of bid (automatic proxy bid)
    - The desired quantity (showing the current value)
    - The initial bid amount (showing the current value)
    - The bid increment (showing the current value)
    - The maximum bid (showing the current value)

3. The buyer uses the "Update Automatic Proxy" webpage to enter the following information and send a "Submit Automatic Proxy Bid" request with the following information to the GPM:
   – The type of bid (automatic proxy bid)
   – A valid desired quantity (possibly updated)
   – The initial bid amount (showing the current value)
   – An invalid new bid increment (which is less than the minimum bid increment)
   – A valid maximum bid (possibly updated)
4. The GPM shall respond by displaying the "Automatic Proxy Update Failed" webpage containing the following information on the browser of the buyer's personal computer:
   – The "Bid Increment Below Minimum" message
   – The auction identifier
   – The item title
   – The invalid new bid increment
   – The minimum bid increment.
5. The buyer uses the "Automatic Proxy Update Failed" webpage to acknowledge the failure of the bid to the GPM.

Postconditions

- None.

Categorization

- **Volatility**: Low
- **Frequency**: Low
- **Criticality**: Medium
- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.2.11.5 Exceptional Path: Excessive Quantity Desired

Path Requirement

The GPM shall prohibit a buyer from modifying his/her existing bid if the new desired quantity is more than that offered by the seller.

Externals

- Buyer (Client)

Preconditions

- The GPM displays the "Auction Description" webpage on the browser of the buyer's personal computer.
- The buyer has placed an automatic proxy bid on the item being auctioned.
- The auction is open.
- The buyer's new desired quantity is more than that offered by the seller.

Interactions

1. The buyer uses the "Auction Description" webpage to send an "Update Automatic Proxy" request to the GPM.
2. The GPM shall respond by displaying the "Update Automatic Proxy" webpage containing the following information on the browser of the buyer's personal computer:
   – The type of bid (automatic proxy bid)

> − The desired quantity (showing the current value)
> − The initial bid amount (showing the current value)
> − The bid increment (showing the current value)
> − The maximum bid (showing the current value)

3. The buyer uses the "Update Automatic Proxy" webpage to enter the following information and send a "Submit Automatic Proxy Bid" request with the following information to the GPM:
   > − The type of bid (automatic proxy)
   > − A new invalid desired quantity (which is more than that offered by the seller)
   > − The initial bid amount (showing the current value)
   > − A valid bid increment (possibly updated)
   > − A valid maximum bid (possibly updated)

4. The GPM shall respond by displaying the "Automatic Proxy Update Failed" webpage containing the following information on the browser of the buyer's personal computer:
   > − The "Excessive Quantity Desired" message
   > − The auction identifier
   > − The item title
   > − The desired quantity of items
   > − The actual quantity of items offered for auction

5. The buyer uses the "Automatic Proxy Update Failed" webpage to acknowledge the failure of the bid to the GPM.

Postconditions

- None.

Categorization

- **Volatility**: Low
- **Frequency**: Low
- **Criticality**: Medium
- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.2.11.6 Exceptional Path: Maximum Bid is Below Minimum Bid

Path Requirement

The GPM shall prohibit a buyer from modifying his/her existing automatic proxy bid on an item if new maximum bid is less than the seller's minimum bid.

Externals

- Buyer (Client)

Preconditions

- The GPM displays the "Auction Description" webpage on the browser of the buyer's personal computer.
- The buyer has placed an automatic proxy bid on the item being auctioned.
- The auction is open.
- The buyer's new maximum bid is less than the seller's minimum bid.

Interactions

1. The buyer uses the "Auction Description" webpage to send an "Update Automatic Proxy" request to the GPM.
2. The GPM shall respond by displaying the "Update Automatic Proxy" webpage containing the following information on the browser of the buyer's personal computer:
   - The type of bid (automatic proxy bid)
   - The initial bid amount (showing the current value)
   - The bid increment (showing the current value)
   - The maximum bid (showing the current value)
3. The buyer uses the "Update Automatic Proxy" webpage to enter the following information and send a "Submit Automatic Proxy Bid" request with the following information to the GPM:
   - The type of bid (automatic proxy)
   - A valid new bid increment
   - An invalid new maximum bid (which is less than the minimum bid)
4. The GPM shall respond by displaying the "Automatic Proxy Update Failed" webpage containing the following information on the browser of the buyer's personal computer:
   - The "Maximum Bid Below Minimum Bid" message
   - The auction identifier
   - The item title
   - The invalid new maximum bid
   - The minimum bid.
5. The buyer uses the "Automatic Proxy Update Failed" webpage to acknowledge the failure of the bid to the GPM.

Postconditions

- None.

Categorization

- **Volatility**: Low
- **Frequency**: Low
- **Criticality**: Medium
- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.2.12 Use Case: GPM Notifies Winning Buyers of Auction Results

Use Case Requirement

The GPM shall notify potentially winning buyers[4] of the results of the auction.

Business Justification

- Buyers need to get in touch with sellers to finalize the purchase.

Requirements Trace

- AVS OG-B-15) Notify Winning Buyers

Use Case Paths

- Normal:

---

[4] The seller may select the actual winning buyers based on their feedback histories.

– Winning buyers notified

- Exceptional:
  – No winning buyers

3.2.2.12.1 Normal Path: Winning Buyers Notified

Path Requirement

The GPM shall notify registered buyers when they win an auction.

Externals

- Buyer (Server)

Preconditions

- The auction has just closed.

- At least one buyer has won the auction (i.e. placed a bid above the minimum bid and above the reserve price, if any).

- Each winning buyer has a current user account.

Interactions

1. The GPM shall send an email containing the following information to each winning buyer:
   – The "You Have Won" message
   – The auction number
   – The item title
   – The item description
   – The buyer's winning bid
   – The closing date and time of the auction
   – The seller's alias

Postconditions

- The GPM has emailed winning notifications to each winner of the auction.

Categorization

- **Volatility**: Medium

- **Frequency**: High

- **Criticality**: High

- **Probability of Defects**: Medium

- **Risk**: High

3.2.2.12.2 Normal Path: No Winning Buyers

Path Requirement

The GPM shall not notify any buyers if no buyers have won the auction.

Externals

- Buyer (Server)

Preconditions

- The auction has just closed.

- No buyer has won the auction (i.e. placed a bid above the minimum bid and above the reserve price, if any).

Interactions

1. None.

Postconditions

- None

Categorization

- **Volatility**: Medium

- **Frequency**: Low

- **Criticality**: Low

- **Probability of Defects**: Medium

- **Risk**: Medium

3.2.2.13 Use Case: Buyer Buys Item at Direct Sale

3.2.2.14 Use Case: Buyer Places Sealed Offer at Decreasing Price Sale

3.2.2.15 Use Case: Buyer Modifies Sealed Offer

3.2.2.16 Use Case: GPM Notifies Buyer of Acceptance of Sealed Offer

3.2.3   Security Officer

The subsection specifies the functional requirements primarily associated with security officers.

Definition

Security Officer is the role played by a GPM employee who responds to potential security violations.

Responsibilities

A security officer has the following responsibilities:

- Ensure that the GPM security requirements are properly implemented.

- Handle potential security violations when notified by the GPM.

Required Capabilities

A security officer needs the following required technical expertise, experience, and training to effectively interact with GPM:

- Trained in systems security techniques.

- Use a security officer personal computer to log onto and navigate the security officer screens.

Use Case Diagram
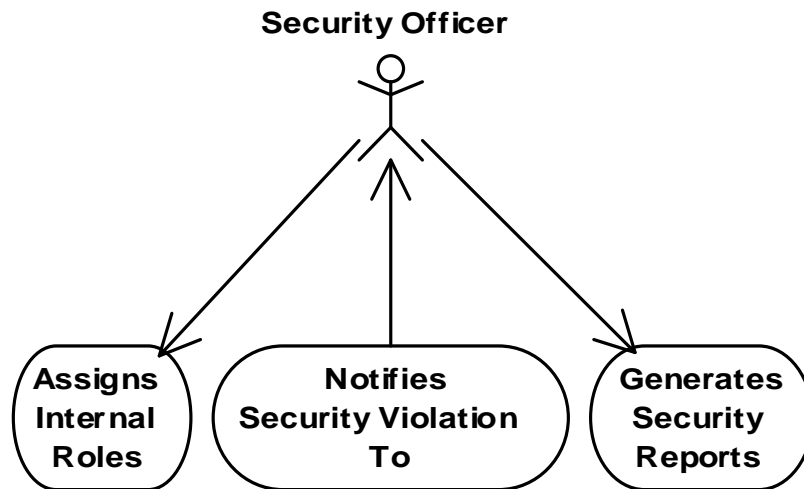
Security Officer

Figure 8: Security Officer Use Case Diagram

Use Cases

- Security Officer Assigns Internal Roles
- GPM Notifies Security Officer of Security Violation
- Security Officer Generates Security Reports

3.2.3.1 Use Case: Security Officer Assigns Internal Roles

Use Case Requirement

The GPM shall enable the security officer to formally assign persons to internal roles.

Business Justification

- The GPM must know the persons who the security officers have authorized to perform the internal roles.

Requirements Trace

- AVS OG-SEC-1) TBD

Use Case Paths

- Normal:
    - Person Authorized as an Accountant
    - Accountant Authorization Revoked
    - Person Authorized as a Security Officer
    - Security Officer Authorization Revoked
    - Person Authorized as a User Support Agent
    - User Support Agent Authorization Revoked
- Exceptional:
    - None

3.2.3.1.1 Normal Path: Person Authorized as an Accountant

Path Requirement

The GPM shall enable a security officer to authorize a person to play the accountant role.

Externals

- Security Officer (Client)

Preconditions

- The person to play the accountant role is an employee.

Interactions

2. A security officer requests that a person with the following information be authorized to play the accountant role:
   - The person's name
   - The person's employee identification number
3. The GPM shall respond by confirming the successful assignment of the person to the accountant role by the security officer:

Postconditions

- The GPM stores the following information:
  - The person's name
  - The person's employee identification number
  - The person's role as accountant

Categorization

- **Volatility**: Low

- **Frequency**: Low

- **Criticality**: Medium

- **Probability of Defects**: Low

- **Risk**: Low

3.2.3.1.2   Normal Path: Accountant Authorization Revoked

3.2.3.1.3   Normal Path: Person Authorized as a Security Officer

3.2.3.1.4   Normal Path: Security Officer Authorization Revoked

3.2.3.1.5   Normal Path: Person Authorized as a User Support Agent

3.2.3.1.6   Normal Path: User Support Agent Authorization Revoked

3.2.3.2   Use Case: GPM Notifies Security Officer of Security Violation

Use Case Requirement

The GPM shall notify the security officer of any potential security violations.

Business Justification

- The GPM must respond quickly and appropriately to any security violations.

Requirements Trace

- AVS OG-SEC-1) TBD

Use Case Paths

- Normal:
  - Identification Failure
  - Authentication Failure

- − Banned User Authorization Failure
- − Suspended User Authorization Failure
- Exceptional:
  - − None

3.2.3.2.1 Normal Path: Identification Failure

Path Requirement

The GPM shall enable notify the security officer when an identification failure repeatedly occurs.

Externals

- Actor (Client)
- Security Officer (Server)

Preconditions

- An actor has failed to properly identify himself three times in a row.

Interactions

1. The GPM shall respond displaying a logon failed message to the user containing the following information:
   - − The "Identification Failed" message
2. The GPM shall respond by sending a high-priority security violation message to the security officer containing the following information:
   - − The "Identification Failed" message
   - − The time and date of the identification failure
   - − The actor's incorrect identifiers

Postconditions

- The GPM breaks the connection with the actor.

Categorization

- **Volatility**: Medium
- **Frequency**: Low
- **Criticality**: High
- **Probability of Defects**: Low
- **Risk**: Medium

3.2.3.2.2 Normal Path: Authentication Failure

Path Requirement

The GPM shall enable notify the security officer when an authentication failure repeatedly occurs.

Externals

- Actor (Client)
- Security Officer (Server)

Preconditions

- An actor has failed to properly authenticate himself three times in a row.

Interactions

1. The GPM shall respond displaying a logon failed message to the user containing the following information:
   - The "authentication failed" message
2. The GPM shall respond by sending a high-priority security violation message to the security officer containing the following information:
   - The "authentication failed" message
   - The time and date of the authentication failure
   - The actor's identifier
   - The incorrect user passwords

Postconditions

- The GPM breaks the connection with the actor.

Categorization

- **Volatility**: Medium
- **Frequency**: Low
- **Criticality**: High
- **Probability of Defects**: Low
- **Risk**: Medium

3.2.3.2.3   Normal Path: Banned User Authorization Failure

Path Requirement

The GPM shall enable notify the security officer when an authentication failure repeatedly occurs.

Externals

- Security Officer (Server)
- User (Client)

Preconditions

- A user has been banned from the GPM.
- The user attempts to log on to the GPM.

Interactions

1. The GPM shall respond displaying a logon failed message to the user containing the following information:
   - The "User Banned" message
2. The GPM shall respond by sending a high-priority security violation message to the security officer containing the following information:
   - The "User Banned" message
   - The time and date of the logon failure
   - The actor's identifier

Postconditions

- The GPM breaks the connection with the user.

Categorization

- **Volatility**: Medium
- **Frequency**: Low

- **Criticality**: High
- **Probability of Defects**: Low
- **Risk**: Medium

3.2.3.2.4 Normal Path: Suspended User Authorization Failure

Path Requirement

The GPM shall enable notify the security officer when an authentication failure repeatedly occurs.

Externals

- Security Officer (Server)
- User (Client)

Preconditions

- A user is currently suspended from the GPM.
- The user has attempted to transact business on GPM capability (i.e., register a sale, bid on an item, or buy an item).

Interactions

1. The GPM shall respond displaying a action failed message to the user containing the following information:
   - The "User Suspended" message
2. The GPM shall respond by sending a high-priority security violation message to the security officer containing the following information:
   - The "User Suspended" message
   - The time and date of the action failure
   - The user's identifier
   - The action attempted

Postconditions

- The GPM has stored a record of the attempted action.

Categorization

- **Volatility**: Medium
- **Frequency**: Low
- **Criticality**: High
- **Probability of Defects**: Low
- **Risk**: Medium

3.2.3.3 Use Case: Security Officer Generates Security Reports

Use Case Requirement

The GPM shall enable the security officer to generate security reports.

Business Justification

- The security officer needs a summary of potential security violations in order to detect trends and determine the effectiveness of the security measures.

Requirements Trace

- AVS OG-SEC-1) TBD

Use Case Paths

- Normal:
    - Security Report Generated
- Exceptional:
    - None

3.2.3.3.1 Normal Path: Security Report Generated

3.2.4 Seller

The subsection specifies the functional requirements primarily associated with sellers.

Definition

Seller is the role played by users who register auctions and fixed price sales held by the GPM.

Responsibilities

A seller has the following responsibilities:

- Follow user agreement.
- Register sales with the GPM.
- Pay seller fees to GPM.
- Ship items to buyers upon receiving payment.
- Register feedback regarding buyers with the GPM.

Required Capabilities

A seller needs the following required technical expertise, experience, and training to effectively interact with GPM:

- Use a personal computer to log onto and navigate a user-friendly website.
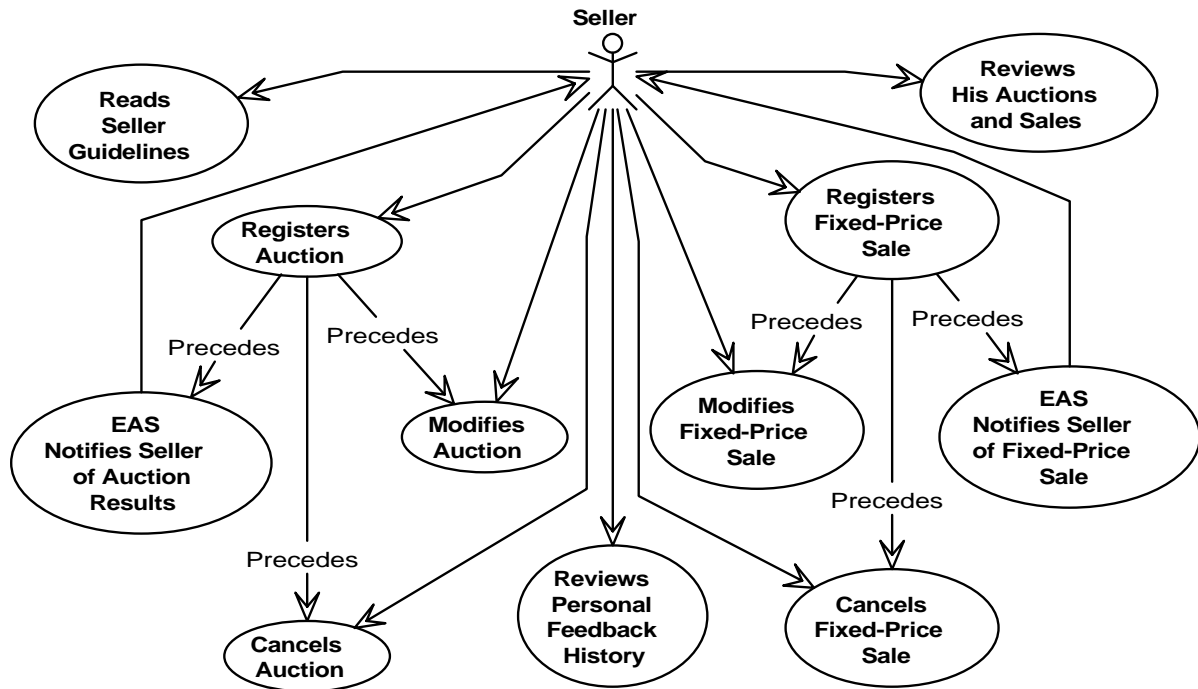
Use Case Diagram

Figure 9: Seller Use Case Diagram

Use Cases

- Seller Reads Seller Guidelines
- Seller Registers Sale
- Seller Modifies Sale
- Seller Cancels Sale
- GPM Notifies Seller of Sale Results
- Seller Reviews Personal Feedback History
- Seller Reviews Personal Sales

3.2.4.1 Use Case: Seller Reads Seller Guidelines

Use Case Requirement

The GPM shall enable sellers to read seller guidelines.

Business Justification

- Sellers often need to read explicit guidelines for running auctions and fixed price sales.

Requirements Trace

- AVS OG-S-1) Seller Reads Seller Guidelines

Use Case Paths

- Normal:
    - Seller Guidelines Read
- Exceptional:

    – None

3.2.4.1.1 Normal Path: Seller Guidelines Read

Path Requirement

The GPM shall enable sellers to read seller guidelines.

Externals

- Seller (Client)

Preconditions

- The GPM displays a webpage enabling the seller to read the seller guidelines.

Interactions
1. The seller sends a read seller guidelines request to the GPM.
2. The GPM shall respond by displaying the seller guidelines to the seller.
3. After reading the instructions, the seller acknowledges reading the seller guidelines to the GPM.

Postconditions

- None.

Categorization

- **Volatility**: Medium
- **Frequency**: Medium
- **Criticality**: High
- **Probability of Defects**: Low
- **Risk**: Medium

3.2.4.2 Use Case: Seller Registers Sales

Use Case Requirement

The GPM shall enable sellers in good standing to register sales.

Business Justification

- Only the seller is the source of information about the item(s) he wishes to auction.
- Sellers demand to set the characteristics (e.g., type of sale, duration, minimum bid, etc.) of their own sales.

Requirements Trace

- AVS OG-S-3) Seller Registers Sales

Use Case Paths

- Normal:
  - Auction Registered
  - Direct Sale Registered
- Exceptional:
  - Mandatory Information Missing
  - Seller Fees Past Due

3.2.4.2.1 Normal Path: Auction Registered

Path Requirement

The GPM shall enable sellers in good standing to register auctions.

Externals

- Seller (Client)

Preconditions

- The GPM displays a webpage enabling the seller to register an auction.
- The seller is a registered user.
- The seller status is "Good".

Interactions

4. The seller sends a register auction request to the GPM.
5. The GPM shall respond by displaying a request for the following information from the seller.
    - Auction information:
        - Seller alias (automatically entered by the GPM)
        - Type of auction (Regular or Dutch)
        - Openness of auction (Private or Public whereby public is the default)
        - Duration of auction (2, 5, 7, 14 days)
        - Minimum starting bid
        - Reserve price (default equals minimum starting bid)
        - Instant win price (optional)
        - Minimum bid increment (optional, whereby the default is one dollar)
        - Acceptable buyer payment methods:
            - Money order/cashiers Check
            - Personal Check
            - Collect on Delivery (COD)
            - Credit Card (American Express, Discover, Visa, Master Card)
            - Electronic cash
    - Item information:
        - Title
        - Quantity
        - Hierarchical categorization
        - Description
        - Item location (city, state, and country)
        - Shipping and insurance responsibility and costs
6. The seller responds by entering and sending the requested auction and item information to the GPM.
7. The GPM shall respond by displaying the following information to the seller:
    - The "Auction Registered" message
    - The auction number
    - The auction duration
    - The auction type
    - The item title
    - The item quantity
8. The seller sends an auction registration acknowledgement to the GPM.

Postconditions

- The GPM stores the information documenting the sale including a unique sale number automatically generated by the GPM.
- After 15 minutes[5], the GPM stores the status of the sale as open, thereby permitting buyers to bid on the item(s) being auctioned.

Categorization

- **Volatility**: Medium
- **Frequency**: High
- **Criticality**: High
- **Probability of Defects**: Medium
- **Risk**: High

3.2.4.2.2 Normal Path: Direct Sale Registered

Path Requirement

The GPM shall enable sellers in good standing to register direct sales.

Externals

- Seller (Client)

Preconditions

- The GPM displays a webpage enabling the seller to register a direct sale.
- The seller is a registered user.
- The seller status is "Good".

Interactions

1. The seller sends a register direct sale request to the GPM.
2. The GPM shall respond by displaying a request for the following information from the seller.
   - Direct sale information:
     - Seller alias (automatically entered by the GPM)
     - Type of auction (Fixed Price or Decreasing Price)
     - Openness of sale (Private or Public whereby public is the default)
     - Duration of sale (2, 5, 7, 14 days)
     - Starting price
     - For Decreasing price sales:
       - Price reduction rate[6]
       - Minimum price
     - Acceptable buyer payment methods:
       - Money order/cashiers Check
       - Personal Check
       - Collect on Delivery (COD)
       - Credit Card (American Express, Discover, Visa, Master Card)

---

[5] This delay allows the seller to change his/her mind and either modify or cancel the auction before it is publicized to the buyers.

[6] Measured in dollars per hour or dollars per day.

- Electronic cash
    - Item information:
        - Title
        - Quantity
        - Hierarchical categorization
        - Description
        - Item location (city, state, and country)
        - Shipping and insurance responsibility and costs
3. The seller responds by entering and sending the requested auction and item information to the GPM.
4. The GPM shall respond by displaying the following information to the seller:
    - The "Direct Sale Registered" message
    - The sale number
    - The sale duration
    - The sale type
    - The item title
    - The item quantity
5. The seller sends an auction registration acknowledgement to the GPM.

Postconditions

- The GPM stores the information documenting the sale including a unique sale number automatically generated by the GPM.

- After 15 minutes[7], the GPM stores the status of the sale as open, thereby permitting buyers to buy the item(s) being sold.

Categorization

- **Volatility**: Medium

- **Frequency**: High

- **Criticality**: High

- **Probability of Defects**: Medium

- **Risk**: High

3.2.4.2.3 Exceptional Path: Mandatory Information Missing

Path Requirement

The GPM shall ensure that sellers enter all mandatory information before an auction is registered.

Externals

- Seller (Client)

Preconditions

- The GPM displays a webpage enabling the seller to register an auction.

- The seller is a registered user.

- The seller status is "Good".

---

[7] This delay allows the seller to change his/her mind and either modify or cancel the auction before it is publicized to the buyers.

Interactions

1. The seller sends a register auction request to the GPM.
2. The GPM shall respond by displaying a request for the following information from the seller.
   - Auction information:
     - Seller alias (automatically entered by the GPM)
     - Type of auction (Regular or Dutch)
     - Openness of auction (Private or Public whereby public is the default)
     - Duration of auction (2, 5, 7, 14 days)
     - Minimum starting bid
     - Reserve price (default equals minimum starting bid)
     - Instant win price (optional)
     - Minimum bid increment (optional, whereby the default is one dollar)
     - Acceptable buyer payment methods:
       - Money order/cashiers Check
       - Personal Check
       - Collect on Delivery (COD)
       - Credit Card (American Express, Discover, Visa, Master Card)
       - Electronic cash
   - Item information:
     - Title
     - Quantity
     - Hierarchical categorization
     - Description
     - Item location (city, state, and country)
     - Shipping and insurance responsibility and costs
3. The seller responds by entering and sending all but some of the mandatory auction and item information to the GPM.
4. The GPM shall respond by displaying an auction registration failed notification with the following information to the seller:
   - The "Missing Mandatory Information" message
   - The missing mandatory information
5. The seller acknowledges the missing information notification to the GPM.
6. The seller enters and resends all of the mandatory information to the GPM.
7. The GPM shall respond by displaying an auction-registered notification to the seller.
8. The seller acknowledges the auction-registered notification to the GPM.

Postconditions

- The GPM stores the information documenting the auction.
- After 15 minutes[8], the GPM stores the status of the auction as open, thereby permitting buyers to bid on the item being auctioned.

Categorization

- **Volatility**: Medium

---

[8] This delay allows the seller to change his/her mind and either modify or cancel the auction before it is publicized to the buyers.

- **Frequency**: Medium

- **Criticality**: High

- **Probability of Defects**: Medium

- **Risk**: High

3.2.4.2.4   Exceptional Path: Seller Fees Past Due

Path Requirement

The GPM shall prohibit a seller from registering an auction if his/her fees are more than the past due limit set by the accountant.

Externals

- Seller (Client)

Preconditions

- The GPM displays the "Seller" webpage on the browser on the seller's personal computer.

- The GPM stores the fact that the seller payment balance is more than the past due limit set by the accountant.

Interactions

1. The seller uses the "Seller" webpage to send a "Register Auction" request to the GPM.
2. The GPM shall respond by displaying the "Auction Registration Failed" webpage with the following information on the browser of the seller's personal computer:
   - The "Account Balance Past Due" message including:
     - The amount that the account balance is overdue
     - The number of days that the account balance is overdue.
3. The seller uses the "Auction Registration Failed" webpage to acknowledge the overdue account balance to the GPM.

Postconditions

- The GPM displays the "Seller" webpage on the browser on the seller's personal computer.

Categorization

- **Volatility**: Medium

- **Frequency**: Low

- **Criticality**: High

- **Probability of Defects**: Medium

- **Risk**: Medium

3.2.4.3   Use Case: Seller Modifies Sale

3.2.4.4   Use Case: Seller Cancels Sale

Use Case Requirement

The GPM shall enable the seller cancel one of his/her auctions prior to the closing date of the auction.

Business Justification

- Sellers may need to cancel an auction (e.g., if the item is no longer available).

Requirements Trace

- AVS OG-S-4) Seller Cancels Auction

Use Case Paths

- Normal:
  – Sale Successfully Cancelled

- Exceptional:
  – Sale Already Closed

3.2.4.4.1 Normal Path: Sale Successfully Cancelled

Path Requirement

The GPM shall enable sellers to cancel their auctions prior to closing.

Externals

- Seller (Client)
- Buyer (Server)

Preconditions

- The GPM displays the "Seller" webpage on the browser on the seller's personal computer.
- The GPM displays the "Review Ongoing Auctions" webpage on the browser on the seller's personal computer.
- The auction has not closed.

Interactions

1. The seller uses the "Review Ongoing Auctions" webpage to send a "Cancel Auction" request containing the following information to the GPM:
   – The auction number
2. The GPM shall respond by displaying the "Cancel Auction" webpage containing the following information on the browser of the seller's personal computer:
   – The auction number
   – The Item title
   – The auction start date
   – The auction closing date and time
   – The current high buyer
   – The current high bid
3. The seller uses the "Cancel Auction" webpage to send the "Cancel Auction" request to the GPM.
4. The GPM shall respond by displaying the "Auction Canceled" webpage containing the following information on the browser of the seller's personal computer.
   – The "Auction Canceled" message
   – The auction number
   – The Item title
5. The seller uses the "Auction Canceled" webpage to acknowledge the auction cancellation to the GPM.
6. The GPM shall respond by sending a cancellation notice email to each of the auction's current buyer's.

Postconditions

- The GPM stores the state of the auction as cancelled.

Categorization

- **Volatility**: Medium
- **Frequency**: Low
- **Criticality**: High

- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.4.4.2 Exceptional Path: Sale Already Closed

Path Requirement

The GPM shall prohibit a seller from canceling one of his/her sales after it has closed.

Externals

- Seller (Client)

Preconditions

- The GPM displays a webpage on the browser on the seller's personal computer enabling the seller to cancel one of his/her sales.
- The auction has already closed.

Interactions

1. The seller uses the webpage to send a "Cancel Auction" request containing the following information to the GPM:
   - The auction number
2. The GPM shall respond by displaying a webpage containing the following information on the browser of the seller's personal computer:
   - The "Auction Closed" message including:
     - The auction number
     - The item title
     - The date and time that the auction closed
   - The OK button
3. The seller uses the webpage to acknowledge the failure of the auction cancellation to the GPM.

Postconditions

- None.

Categorization

- **Volatility**: Medium
- **Frequency**: Low
- **Criticality**: Medium
- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.4.5 Use Case: GPM Notifies Seller of Sale Results

Use Case Requirement

The GPM shall notify the seller of the sale results upon closing of the sale.

Business Justification

- Sellers need to select a winning buyer to arrange for the sale.

Requirements Trace

- AVS OG-S-5) GPM Notifies Seller of Auction Results

Use Case Paths

- Normal:

- Dutch Auction with Winning Buyers
- Yankee Auction with High Bid Winning Buyer
- Yankee Auction with Instant Winner
- Fixed-Price Sale
- Decreasing-Price Sale
- Decreasing-Price Sale with Sealed Offer
- Exceptional:
  - No Bids were Placed
  - Reserve Price Not Met
  - Seller Cannot Contact Winning Buyer within Contact Time Limit

3.2.4.5.1 Normal Path: Dutch Auction with Winning Buyers

The GPM shall notify the seller of the auction results upon closing of the seller's auction

Externals

- Seller (Server)

Preconditions

- The auction is a Dutch auction.
- The auction has closed normally.
- At least one bid is greater than or equal to the reserve price.
- No bid is greater than or equal to the instant win price.

3.2.4.5.2 Normal Path: Regular Auction with High Bid Winning Buyer

Path Requirement

The GPM shall enable sellers to select the winning buyers.

Externals

- Seller (Server)

Preconditions

- The GPM records the auction as a regular auction.
- The GPM records the auction as closed, but not cancelled.
- The GPM records at least one bid that is greater than or equal to the reserve price.
- The GPM does not record any bid that is greater than or equal to the instant win price.

Interactions

1. When the auction closes, the GPM shall respond by emailing an auction results notification containing the following information to the seller
   - The "Regular Auction Results" message
   - The seller's name
   - The seller's alias
   - The auction number
   - The item title
   - The item description
   - The time and date that the auction closed.
   - The winning buyer's:

- – Alias
- – Email address
- – Winning bid
- – The number of items requested.

Postconditions

- The GPM records the winning buyers and the associated winning bids for the auction.

Categorization

- **Volatility**: Medium
- **Frequency**: High
- **Criticality**: High
- **Probability of Defects**: Medium
- **Risk**: High

3.2.4.5.3   Normal Path: Regular Auction with Instant Winner

Path Requirement

The GPM shall notify the seller of the auction results upon closing of the seller's auction

Externals

- Seller (Server)

Preconditions

- The auction is a regular auction.
- The auction is open.
- A buyer has submitted a bid whereby:
  - – The bid price equals the instant win price.
  - – The number of items requested is less than or equal to the number of items being auctioned.

Interactions

1. When a bid equal to the instant win price is placed, the GPM shall email an auction results notification containing the following information to the seller:
   - – The "Instant Winner Auction Results" message
   - – The seller's name
   - – The seller's alias
   - – The auction number
   - – The item title
   - – The item description
   - – The quantity of items remaining
   - – The time and date that the auction closed (if the number of items requested equals the number of items being auctioned).
   - – The winning buyer's:
     - – Alias
     - – Email address
     - – Instant winner bid
     - – The number of items requested.

Postconditions

- The GPM has emailed an auction results notification to the seller of the auction.

- The GPM has debited the number of items being auctioned by the amount requested.

- If the number of items requested equals the number of items being auctioned, then the GPM stores the state of the auction as closed.

Categorization

- **Volatility**: Medium

- **Frequency**: Medium

- **Criticality**: High

- **Probability of Defects**: Medium

- **Risk**: High

3.2.4.5.4 Exceptional Path: No Bid Placed

Path Requirement

The GPM shall not select a winning buyer when there is no bid.

Externals

- Seller (Client)

Preconditions

- The GPM displays the "Review Ongoing Auctions" webpage on the browser on the seller's personal computer.

- The GPM displays the "Auction Description" webpage on the browser on the seller's personal computer.

- The GPM records the auction as regular or reserved (i.e., the auction is not a Dutch auction, the winners of which are automatically selected by the GPM).

- The GPM records the auction as closed, but not cancelled.

- The GPM records that no buyer has bid on the item being auctioned.

- The GPM does not record that the seller has selected and registered winning buyers with the GPM.

Interactions

1. The seller uses the "Auction Description" webpage to send a "Review Buyers" request to the GPM.
2. The GPM shall respond by displaying the "Select Winning Buyers Failed" webpage on the browser of the seller's personal computer:
   - The "No Bids Placed" message
   - The auction number
   - The item title
3. The seller uses the "Select Winning Buyers Failed" webpage to send an acknowledgement of the failure to the GPM.

Postconditions

- The GPM displays the "Review Ongoing Auctions" webpage on the browser on the seller's personal computer.

Categorization

- **Volatility**: Medium

- **Frequency**: Low

- **Criticality**: Medium
- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.4.5.5 Exceptional Path: Reserve Price Not Met

Path Requirement

The GPM shall not select a winning buyer when the highest bid does not meet the seller's reserve price.

Externals

- Seller (Client)

Preconditions

- The GPM displays the "Review Ongoing Auctions" webpage on the browser on the seller's personal computer.
- The GPM displays the "Auction Description" webpage on the browser on the seller's personal computer.
- The GPM records the auction type as Reserve.
- The GPM records that no buyer has met the reserve price.
- The GPM records the auction as closed, but not cancelled.
- The GPM does not record that the seller has selected and registered winning buyers with the GPM.

Interactions

1. The seller uses the "Auction Description" webpage to send a "Review Buyers" request to the GPM.
2. The GPM shall respond by displaying the "Review Buyers" webpage containing the following information on the browser of the seller's personal computer:
   - The auction number
   - The item title
   - For each buyer in the auction (sorted from high to low final bid):
     - The buyer's alias
     - The buyer's highest bid
     - A summary of the buyer's feedback (number of positive, neutral, and negative feedbacks).
3. After selecting the winning buyer(s), the seller uses the "Review Buyers" webpage to send a "Select Winning Buyers" message containing the following information to the GPM:
   - For each winning buyer:
     - The buyer's alias
4. The GPM shall respond by displaying the "Select Winning Buyers Failed" webpage on the browser of the seller's personal computer:
   - The "No Bids Bid Meets the Reserve Price" message
   - The auction number
   - The item title
5. The seller uses the "Select Winning Buyers Failed" webpage to send an acknowledgement of the failure to the GPM.

Postconditions

- The GPM displays the "Review Ongoing Auctions" webpage on the browser on the seller's personal computer.

Categorization

- **Volatility**: Medium
- **Frequency**: Low
- **Criticality**: Medium
- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.4.6 Use Case: Seller Reviews Personal Feedback History

Use Case Requirement

The GPM shall enable sellers to review the feedback history of buyers at their auctions.

Business Justification

- Sellers may choose not to sell to winning buyers if the buyers have a history of not paying for purchased items.

Requirements Trace

- AVS OG-S-6) Seller Reviews Personal Buyer's Feedback Histories

Use Case Paths

- Normal:
    - Histories reviewed
- Exceptional:
    - None

3.2.4.6.1 Normal Path: Histories Reviewed When Auction is Open

Path Requirement

The GPM shall enable sellers to review the feedback histories of the buyers at their ongoing auctions.

Externals

- Seller (Client)

Preconditions

- The GPM displays the "Review Ongoing Auctions" webpage on the browser on the seller's personal computer.
- The GPM displays the "Auction Description" webpage on the browser on the seller's personal computer.

Interactions

1. The seller uses the "Auction Description" webpage to send a "Review Buyers" request containing the following information to the GPM:
    - The auction number
2. The GPM shall respond by displaying the "Review Buyers" webpage listing the following information on the browser of the seller's personal computer:
    - The auction number
    - The item title
    - For each buyer (ordered from high to low bid):
        - The buyer's alias
        - A summary of the buyer's feedback (number of positive, neutral, and negative feedbacks).

3. **Loop**: After selecting a buyer, the seller uses the "Review Buyers" webpage to send a "Review Buyer Feedback History" message containing the following information to the GPM:
   - The buyer alias
4. The GPM shall respond by displaying the "Buyer Feedback History" webpage listing the following information on the browser of the seller's personal computer:
   - The buyer's alias
   - A summary of the buyer's feedback (number of positive, neutral, and negative feedbacks).
   - For each feedback:
     - The feedback date and time
     - The auction number
     - The item description
     - The alias of the feedback provider
     - The role played by the buyer (buyer or seller)
     - The type of feedback
     - The feedback comment
5. After reviewing the buyer's feedback history, the seller uses the "Buyer Feedback History" webpage to send a "Close Buyer Feedback History" message to the GPM.
6. **End loop**: The GPM shall respond by closing the buyer's "Buyer Feedback History" webpage on the browser of the seller's personal computer.
7. The seller uses the "Review Buyers" webpage to send a "Close Review Buyers" message to the GPM.

Postconditions

- The GPM displays the "Review Ongoing Auctions" webpage on the browser on the seller's personal computer.

Categorization

- **Volatility**: Medium
- **Frequency**: Medium
- **Criticality**: High
- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.4.7 Use Case: Seller Reviews Personal Sales

Use Case Requirement

The GPM shall enable sellers to review their recent and open sales.

Business Justification

- Sellers want to conveniently know the status of their sales.

Requirements Trace

- AVS OG-S-9) Seller Reviews Personal Sales

Use Case Paths

- Normal:
  - Sales Reviewed
- Exceptional:
  - No Sales

3.2.4.7.1 Normal Path: Sales Reviewed

Path Requirement

The GPM shall enable sellers to review the status of their sales.

Externals

- Seller (Client)

Preconditions

- The GPM displays the "Seller" webpage on the browser on the seller's personal computer.
- The GPM records at least one auction for the seller that was open within the previous 30 days.

Interactions

1. The seller uses the "Seller" webpage to send a "Review Auctions" request to the GPM.
2. The GPM shall respond by displaying the "Review Ongoing Auctions" webpage containing the following information on the browser of the seller's personal computer:
   - For each auction (sorted by end date and time):
     - The auction number
     - The item title
     - The state of the auction (open, closed, cancelled)
     - The start date of the auction
     - The end date and time of the auction
     - The buyer (high buyer of open auctions, winning buyers of closed auctions)
     - The bid price (high bid of open auctions, actual winning bid of closed auctions)
     - The reserve price (if any)
3. The seller uses the "Review Ongoing Auctions" webpage to request closing the webpage to the GPM.

Postconditions

- The GPM displays the "Seller" webpage on the browser on the seller's personal computer.

Categorization

- **Volatility**: Medium
- **Frequency**: Medium
- **Criticality**: Medium
- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.4.7.2 Exceptional Path: No Sales

Path Requirement

The GPM shall notify sellers if they have no sales.

Externals

- Seller (Client)

Preconditions

- The GPM displays the "Seller" webpage on the browser on the seller's personal computer.
- The GPM records at no auctions for the seller were open within the previous 30 days.

Interactions

1. The seller uses the "Seller" webpage to send a "Review Auctions" request to the GPM.

2. The GPM shall respond by displaying the "Review Ongoing Auctions Failed" webpage containing the following information on the browser of the seller's personal computer:
   – The "No Auctions" message
3. The seller uses the "Review Ongoing Auctions Failed" webpage to acknowledge that there were no auctions to the GPM.

Postconditions

- The GPM displays the "Seller" webpage on the browser on the seller's personal computer.

Categorization

- **Volatility**: Medium
- **Frequency**: Low
- **Criticality**: Medium
- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.5   User

The subsection specifies the functional requirements primarily associated with users.

Definition

A *user* is the role played by a person who uses the GPM.

Responsibilities

A user has the following responsibilities:

- Create and maintain a user account with the GPM.

Required Capabilities

A user needs the following required technical expertise, experience, and training to effectively interact with GPM:

- Use a personal computer to log onto and navigate a user-friendly website.

States

A user can be in the following states:

- Account Open:
  – In Good Standing
  – Payment Past Due
  – Suspended
- Account Closed:
  – Banned
  – Deleted
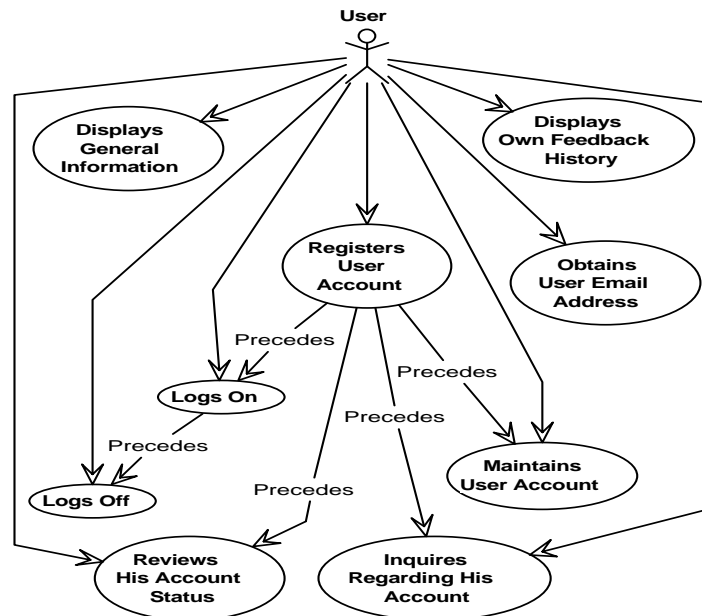
Use Case Diagram

Figure 10: User Use Case Diagram

Use Cases

- User Registers User Account
- User Maintains User Account
- User Logs On
- User Logs Off
- User Displays General Information
- User Displays Own Feedback History
- User Obtains User Email Address
- User Reviews Personal Account
- User Inquires Regarding Personal Account

3.2.5.1 Use Case: User Registers User Account

Use Case Requirement

The GPM shall enable new users to register by creating a user account.

Business Justification

- User information is required for billing sellers for auction fees.
- Users should be able to reuse their account information without having to reenter it each time that hold an auction or place a bid.

Requirements Trace

- AVS OG-U-1) Register User Account

Use Case Paths

- Normal:

- New Account Created
- Exceptional:
  - Account Already Exists
  - User Identifier is not Unique
  - Mandatory Information Missing

3.2.5.1.1 Normal Path: New Account Created

Path Requirement

The GPM shall enable users to register by creating a new user account.

Externals

- User (Client)

Preconditions

- The GPM displays the "GPM Home" webpage on the browser of the user's personal computer.
- The GPM does not record a user account that has the same user name and either the same email address or same telephone number.

Interactions

1. The user uses the "GPM Home" webpage to send a "Register User" request to the GPM.
2. The GPM shall respond by displaying a "Register User" webpage with the following message requesting the following mandatory information from the user:
   - The "Register User" message
   - User Name
   - User Alias
   - Email Address
   - Postal Address:
     - Street Address
     - City
     - State
     - Zip Code
   - Telephone Number
   - Password
   - Password Confirmation
3. The user uses the "Register User" webpage to send a "Register User" request containing the following information to the GPM:
   - User Name
   - User Alias
   - Email Address
   - Postal Address:
     - Street Address
     - City
     - State
     - Zip Code
   - Telephone Number
   - Password
   - Password Confirmation

4. The GPM shall respond by displaying a "Verify Account Information" webpage containing the following information to the user:
   - User Name
   - User Alias
   - Email Address
   - Postal Address:
     - Street Address
     - City
     - State
     - Zip Code
   - Telephone Number
   - Password

5. The user uses the "Verify Account Information" webpage to send an "Information Correct" confirmation to the GPM.

6. The GPM shall respond by sending a "Confirmation Number Notification" email containing the following information to the user:
   - User Name
   - User Alias
   - Account Number
   - Confirmation Number

7. The GPM shall respond by displaying a "Check Email for Confirmation" webpage requesting the following information to the user:
   - The "Check Email for Confirmation" message
   - Confirmation Number

8. The user uses the "Check Email for Confirmation" webpage to send a "Confirm Account" request containing the following information to the GPM:
   - Confirmation Number

9. The GPM shall respond by displaying a "Welcome" webpage containing the following information to the user:
   - The "Welcome" message

10. The user uses the "Welcome" webpage to send an acknowledgement to the GPM.

Postconditions

- The GPM records the following user information:
  - User Name
  - User Identifier
  - Email Address
  - Postal Address:
    - Street Address
    - City
    - State
    - Zip Code
  - Telephone Number
  - Password
  - Account Status = "Active"
  - Account History = null

  − Account Balance = $0.00

Categorization

- **Volatility**: Medium

- **Frequency**: Medium

- **Criticality**: High

- **Probability of Defects**: Medium

- **Risk**: High

3.2.5.1.2 Exceptional Path: Account Already Exists

The GPM shall prohibit a user from having multiple accounts.

Externals

- User (Client)

Preconditions

- The GPM displays the "GPM Home" webpage on the browser of the user's personal computer.

- The GPM records a user account that has the same user name and either the same email address or same telephone number.

Interactions

1. The user uses the "GPM Home" webpage to send a "Register User" request to the GPM.

2. The GPM shall respond by displaying a "Register User" webpage requesting the following mandatory information from the user:
   − User Name
   − User Identifier
   − Email Address
   − Postal Address:
      − Street Address
      − City
      − State
      − Zip Code
   − Telephone Number
   − Password
   − Password Confirmation

3. The user uses the "Register User" webpage to send a "Register User" request containing the following information to the GPM:
   − User Name
   − User Identifier
   − Email Address
   − Postal Address:
      − Street Address
      − City
      − State
      − Zip Code
   − Telephone Number
   − Password

‒ Password Confirmation

4. The GPM shall respond by displaying a "Register User Failed" webpage containing the following information to the user:
   ‒ The "User Already Registered" message
   ‒ User Name (labeled as duplicate)
   ‒ User Identifier
   ‒ Email Address (possibly labeled as duplicate)
   ‒ Postal Address:
      ‒ Street Address
      ‒ City
      ‒ State
      ‒ Zip Code
   ‒ Telephone Number (possibly labeled as duplicate)
   ‒ Password

5. The user uses the "Register User Failed" webpage to send an acknowledgement to the GPM.

Postconditions

- The GPM displays the "Home" webpage on the browser of the user's personal computer.

Categorization

- **Volatility**: Low
- **Frequency**: Low
- **Criticality**: Medium
- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.5.1.3 Exceptional Path: User Identifier is Not Unique

Path Requirement

The GPM shall require users to select a unique user identifier.

Externals

- User (Client)

Preconditions

- The GPM displays the "Home" webpage on the browser on the use's personal computer.
- The GPM does not record a user account that has the same user name and either the same email address or same telephone number.

Interactions

1. The user uses the "GPM Home" webpage to send a "Register User" request to the GPM.
2. The GPM shall respond by displaying a "Register User" webpage requesting the following mandatory information from the user:
   ‒ User Name
   ‒ User Identifier
   ‒ Email Address
   ‒ Postal Address:
      ‒ Street Address
      ‒ City

    –   State

    –   Zip Code

  –   Telephone Number

  –   Password

  –   Password Confirmation

3.   The user uses the "Register User" webpage to send a "Register User" request containing the following information to the GPM:

  –   User Name

  –   Existing User Identifier

  –   Email Address

  –   Postal Address:

    –   Street Address

    –   City

    –   State

    –   Zip Code

  –   Telephone Number

  –   Password

  –   Password Confirmation

4.   After verifying that the user identifier is not unique, the GPM shall respond by displaying a "Register User Failed" webpage containing the following information to the user:

  –   The "User Identifier Not Unique" message

  –   User Identifier (labeled as not unique)

5.   The user uses the "Register User Failed" webpage to send a "Register User" request containing the following information to the GPM:

  –   New Unique User Identifier

6.   The GPM shall respond by closing the "Register User Failed" webpage on the browser of the user's personal computer.

7.   The GPM shall respond by displaying a "Verify Account Information" webpage containing the following information to the user:

  –   User Name

  –   User Identifier

  –   Email Address

  –   Postal Address:

    –   Street Address

    –   City

    –   State

    –   Zip Code

  –   Telephone Number

  –   Password

8.   The user uses the "Verify Account Information" webpage to send an "Information Correct" confirmation to the GPM.

9.   The GPM shall respond by sending a "Confirmation Number" email containing the following information to the user:

  –   User Name

  –   User Identifier

  –   Confirmation Number

10. The GPM shall respond by displaying a "Check Email for Confirmation" webpage requesting the following information to the user:
    – Confirmation Number
11. The user uses the "Check Email for Confirmation" webpage to send a "Confirm Account" request containing the following information to the GPM:
    – Confirmation Number
12. The GPM shall respond by displaying a "Welcome" webpage containing the following information to the user:
    – The "Welcome" message
13. The user uses the "Welcome" webpage to send an acknowledgement to the GPM.

Postconditions

- The GPM records the following user information:
  – User Name
  – User Identifier
  – Email Address
  – Postal Address:
    – Street Address
    – City
    – State
    – Zip Code
  – Telephone Number
  – Password
  – Account Status = "Active"
  – Account History = null
  – Account Balance = $0.00

Categorization

- **Volatility**: Medium
- **Frequency**: Low
- **Criticality**: High
- **Probability of Defects**: Medium
- **Risk**: High

3.2.5.1.4 Exceptional Path: Mandatory Information Missing

Path Requirement

The GPM shall require users to enter all mandatory information when registering.

Externals

- User (Client)

Preconditions

- The GPM displays the "Home" webpage on the browser on the user's personal computer.
- The GPM does not record a user account that has the same user name and either the same email address or same telephone number.

Interactions

1. The user uses the "GPM Home" webpage to send a "Register User" request to the GPM.

2. The GPM shall respond by displaying a "Register User" webpage requesting the following mandatory information from the user:
   – User Name
   – User Identifier
   – Email Address
   – Postal Address:
       – Street Address
       – City
       – State
       – Zip Code
   – Telephone Number
   – Password
   – Password Confirmation

3. The user uses the "Register User" webpage to send a "Register User" request missing some of the following mandatory information to the GPM:
   – User Name
   – Existing User Identifier
   – Email Address
   – Postal Address:
       – Street Address
       – City
       – State
       – Zip Code
   – Telephone Number
   – Password
   – Password Confirmation

4. After verifying that mandatory information is missing, the GPM shall respond by displaying a "Register User Failed" webpage containing the following information to the user:
   – The "Missing Mandatory Information" message
   – A list of the missing information

5. The user uses the "Register User Failed" webpage to acknowledge the missing information to the GPM.

6. After filling in the missing information, the user uses the "Register User" webpage to send a "Register User" request containing the following mandatory information to the GPM:
   – User Name
   – Existing User Identifier
   – Email Address
   – Postal Address:
       – Street Address
       – City
       – State
       – Zip Code
   – Telephone Number
   – Password
   – Password Confirmation

7. The GPM shall respond by displaying a "Verify Account Information" webpage containing the following information to the user:
   - User Name
   - User Identifier
   - Email Address
   - Postal Address:
     - Street Address
     - City
     - State
     - Zip Code
   - Telephone Number
   - Password
8. The user uses the "Verify Account Information" webpage to send an "Information Correct" confirmation to the GPM.
9. The GPM shall respond by sending a "Confirmation Number" email containing the following information to the user:
   - User Name
   - User Identifier
   - Confirmation Number
10. The GPM shall respond by displaying a "Check Email for Confirmation" webpage requesting the following information to the user:
    - Confirmation Number
11. The user uses the "Check Email for Confirmation" webpage to send a "Confirm Account" request containing the following information to the GPM:
    - Confirmation Number
12. The GPM shall respond by displaying a "Welcome" webpage containing the following information to the user:
    - The "Welcome" message
13. The user uses the "Welcome" webpage to send an acknowledgement to the GPM.

Postconditions

- The GPM records the following user information:
  - User Name
  - User Identifier
  - Email Address
  - Postal Address:
    - Street Address
    - City
    - State
    - Zip Code
  - Telephone Number
  - Password
  - Account Status = "Active"
  - Account History = null
  - Account Balance = $0.00

Categorization

- **Volatility**: Medium
- **Frequency**: Low
- **Criticality**: High
- **Probability of Defects**: Medium
- **Risk**: High
- **Risk**: High

3.2.5.2 Use Case: User Maintains User Account

Use Case Requirement

The GPM shall enable users to modify their accounts.

Business Justification

- Users change their names (e.g., when they marry)
- Users change their Internet service providers (ISPs) and addresses.
- Users may choose no longer to take part in auctions.

Requirements Trace

- AVS OG-U-2) Maintain User Account

Use Case Paths

- Normal:
    - User Information Updated
    - User Account Deleted
- Exceptional:
    - New User Identifier is Not Unique
    - Mandatory Information Deleted
    - Use Account Not Deleted

3.2.5.2.1 Normal Path: User Information Updated

Path Requirement

The GPM shall enable users to change their names, identifiers, email addresses, postal addresses, and telephone numbers.

Externals

- User (Client)

Preconditions

- The GPM records a user account for the user.
- The GPM records the account status as active.
- The GPM displays the "Home" webpage on the browser on the user's personal computer.

Interactions

1. The user uses the "GPM Home" webpage to send a "Maintain User Account" request to the GPM.
2. The GPM shall respond by displaying a "Maintain User Account" webpage containing the following information from the user:
    - The "Maintain User Account" message
    - User Name

- − User Alias
- − Email Address
- − Postal Address:
  - − Street Address
  - − City
  - − State
  - − Zip Code
- − Telephone Number
- − Optional Credit Card Information:
  - − Name on Credit Card
  - − Credit Card Number
  - − Expiration Date
  - − Credit Card Billing Address

3. After updating the user information, the user uses the "Maintain User Account" webpage to send a "Update User Account" request to the GPM.

4. After verifying that the no mandatory information was deleted, the GPM shall respond by displaying a "Verify Account Information" webpage containing the following information (with changed information highlighted) to the user:

- − The "Verify Account Information" message
- − User Name
- − User Identifier
- − Email Address
- − Postal Address:
  - − Street Address
  - − City
  - − State
  - − Zip Code
- − Telephone Number
- − Optional Credit Card Information:
  - − Name on Credit Card
  - − Credit Card Number
  - − Expiration Date
  - − Credit Card Billing Address

5. After verifying the new information, the user uses the "Verify Account Information" webpage to acknowledge the update to the GPM.

6. The GPM shall respond by displaying a "User Account Updated" webpage requesting the following information to the user:

- − The "User Account Updated" message

7. The user uses the "User Account Updated" webpage to acknowledge the update to the GPM.

Postconditions

- The GPM stores the updated account information of the user.

Categorization

- **Volatility**: Medium
- **Frequency**: Low

- **Criticality**: Medium
- **Probability of Defects**: Low
- **Risk**: Medium

3.2.5.2.2 Normal Path: User Account Deleted

Path Requirement

The GPM shall enable users to delete their user accounts if they have no outstanding balance.

Externals

- User (Client)

Preconditions

- The GPM records a user account for the user.
- The GPM records the account status as active.
- The GPM records the account balance as $0.00.
- The GPM displays the "Home" webpage on the browser on the user's personal computer.

Interactions

1. The user uses the "GPM Home" webpage to send a "Delete User Account" request to the GPM.
2. The GPM shall respond by displaying a "Delete User Account" webpage containing the following mandatory information from the user:
    - The "Delete Your Account" message
    - User Name
    - User Identifier
    - Email Address
    - Postal Address:
        - Street Address
        - City
        - State
        - Zip Code
    - Telephone Number
    - Account Balance
3. The user uses the "Delete User Account" webpage request deletion of his/her user account to the GPM.
4. After verifying that the account balance is zero, the GPM shall respond by displaying a "User Account Deleted" webpage containing the following information to the user:
    - The "User Account Deleted" message
5. The user uses the "User Account Deleted" webpage to acknowledge the deletion to the GPM.

Postconditions

- The GPM stores the state of the user account as deleted by the user.
- The GPM stores the state of all of the user's open auctions as cancelled.
- The GPM stores the state of all of the user's bids in open auctions as withdrawn.

Categorization

- **Volatility**: Medium
- **Frequency**: Low
- **Criticality**: Medium

- **Probability of Defects**: Medium
- **Risk**: High

3.2.5.2.3 Exceptional Path: New User Identifier is Not Unique

Path Requirement

The GPM shall require users to chose a unique user identifier.

Externals

- User (Client)

Preconditions

- The GPM records a user account for the user.
- The GPM records the account status as active.
- The GPM displays the "Home" webpage on the browser on the user's personal computer.

Interactions

1. The user uses the "GPM Home" webpage to send a "Maintain User Account" request to the GPM.
2. The GPM shall respond by displaying a "Maintain User Account" webpage containing the following mandatory information from the user:
   - User Name
   - User Identifier
   - Email Address
   - Postal Address:
       - Street Address
       - City
       - State
       - Zip Code
   - Telephone Number
3. After updating the user information, the user uses the "Maintain User Account" webpage to send a "Update User Account" request to the GPM.
4. After verifying that the user identifier is not unique, the GPM shall respond by displaying a "Maintain User Account Failed" webpage containing the following information to the user:
   - The "User Identifier Not Unique" message
   - User Identifier (labeled as not unique)
5. The user uses the "Maintain User Account Failed" webpage to send a "Update User Identifier" request containing the following information to the GPM:
   - New Unique User Identifier
6. The GPM shall respond by closing the "Maintain User Account Failed" webpage on the browser of the user's personal computer.
7. The GPM shall respond by displaying a "Verify Account Information" webpage containing the following information to the user:
   - User Name
   - User Identifier
   - Email Address
   - Postal Address:
       - Street Address
       - City

- − State
- − Zip Code
- − Telephone Number
8. The user uses the "Verify Account Information" webpage to send an "Information Correct" confirmation to the GPM.
9. The GPM shall respond by displaying a "User Account Updated" webpage requesting the following information to the user:
   - − The "User Account Updated" message
10. The user uses the "User Account Updated" webpage to acknowledge the update to the GPM.

Postconditions

- The GPM stores the updated account information of the user.

Categorization

- **Volatility**: Medium
- **Frequency**: Low
- **Criticality**: High
- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.5.2.4 Exceptional Path: Mandatory Information Deleted

Path Requirement

The GPM shall prohibit a user from deleting the following mandatory information from his/her user account:

- User name
- User identifier
- User email address
- User postal address
- User telephone number
- User account balance

Externals

- User (Client)

Preconditions

- The GPM displays the "Home" webpage on the browser on the user's personal computer.

Interactions
1. The user uses the "GPM Home" webpage to send a "Maintain User Account" request to the GPM.
2. The GPM shall respond by displaying a "Maintain User Account" webpage containing the following mandatory information from the user:
   - − User Name
   - − User Identifier
   - − Email Address
   - − Postal Address:
     - − Street Address
     - − City
     - − State

- Zip Code
- Telephone Number

3. After updating the user information, the user uses the "Maintain User Account" webpage to send a "Update User Account" request to the GPM.

4. After verifying that mandatory information was deleted, the GPM shall respond by displaying a "Maintain User Account Failed" webpage containing the following information (with missing information highlighted) to the user:
    - The "Missing Mandatory Information" message
    - User Name
    - User Identifier
    - Email Address
    - Postal Address:
        - Street Address
        - City
        - State
        - Zip Code
    - Telephone Number

5. After entering the missing information, the user uses the "Maintain User Account Failed" webpage to acknowledge the update to the GPM.

6. The GPM shall respond by displaying a "User Account Updated" webpage requesting the following information to the user:
    - The "User Account Updated" message

7. The user uses the "User Account Updated" webpage to acknowledge the update to the GPM.

Postconditions

- The GPM stores the updated account information of the user.

Categorization

- **Volatility**: Medium
- **Frequency**: Low
- **Criticality**: High
- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.5.2.5 Exceptional Path: User Account Not Deleted

Path Requirement

The GPM shall not enable users to delete their user accounts if they have positive balances.

Externals

- User (Client)

Preconditions

- The GPM records a user account for the user.
- The GPM records the account status as active.
- The GPM records the account balance as positive.
- The GPM displays the "Home" webpage on the browser on the user's personal computer.

Interactions

1. The user uses the "GPM Home" webpage to send a "Delete User Account" request to the GPM.
2. After verifying that the account balance is positive, the GPM shall respond by displaying a "Delete User Account Failed" webpage containing the following information (with missing information highlighted) to the user:
   - The "Account Balance Must be Zero" message
   - Current account balance
3. The user uses the "Delete User Account Failed" webpage to acknowledge that the deletion failed to the GPM.

Postconditions

- The GPM displays the "Home" webpage on the browser on the user's personal computer.

Categorization

- **Volatility**: Medium
- **Frequency**: Low
- **Criticality**: Medium
- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.5.3 Use Case: User Displays General Information

This subsection specifies the functional requirements associated with the "User Displays General Information" use case.

Use Case Requirement

The GPM shall enable users to display general information about GPM, GPM, and electronic auctions.

Business Justification

- Users need general information because many are new to GPM, GPM, and electronic auctions.

Requirements Trace

- AVS QG-U-6) Display General Information

Use Case Paths

- Normal:
  - GPM Description Displayed
  - GPM Description Displayed
  - Frequently Asked Questions Displayed
  - Electronic Auction Glossary Displayed
  - User Agreement Displayed
  - Privacy Policy Displayed
- Exceptional:
  - None

3.2.5.3.1 Normal Path: GPM Description Displayed

Path Requirement

The GPM shall enable users to display a description of the GPM.

Externals

- User (Client)

Preconditions

- The GPM displays on the "GPM Home" webpage on the browser of the user's personal computer.

Interactions

1. The user uses the "GPM Home" webpage to send a "Display GPM Description" request to the GPM.
2. The GPM shall respond by opening the "GPM Description" webpage on the browser of the user's personal computer.
3. After reading the GPM description, the user uses the "GPM Description" webpage to send a "Close Current Webpage" request to the GPM.

Postconditions

- The GPM displays on the "GPM Home" webpage on the browser of the user's personal computer.

Categorization

- **Volatility**: Low
- **Frequency**: High
- **Criticality**: High
- **Probability of Defects**: Medium
- **Risk**: High

3.2.5.3.2   Normal Path: GPM Description Displayed

Path Requirement

The GPM shall enable users to display a description of the GPM.

Externals

- Actor (Client)

Preconditions

- The GPM displays on the "GPM Home" webpage on the browser of the user's personal computer.

Interactions

1. The user uses the "GPM Home" webpage to send a "Display GPM Description" request to the GPM.
2. The GPM shall respond by opening the "GPM Description" webpage on the browser of the user's personal computer.
3. After reading the GPM description, the user uses the "GPM Description" webpage to send a "Close Current Webpage" request to the GPM.

Postconditions

- The GPM displays on the "GPM Home" webpage on the browser of the user's personal computer.

Categorization

- **Volatility**: Low
- **Frequency**: High
- **Criticality**: High
- **Probability of Defects**: Medium
- **Risk**: High

3.2.5.3.3   Normal Path: Frequently Asked Questions Displayed

Path Requirement

The GPM shall enable users to display the answers to frequently asked questions.

Externals

- User (Client)

Preconditions

- The GPM displays on the "GPM Home" webpage on the browser of the user's personal computer.

Interactions

1. The user uses the "GPM Home" webpage to send a "Display FAQ" request to the GPM.
2. The GPM shall respond by opening the "FAQ" webpage on the browser of the user's personal computer.
3. After reading the frequently asked questions, the user uses the "FAQ" webpage to send a "Close Current Webpage" request to the GPM.

Postconditions

- The GPM displays on the "GPM Home" webpage on the browser of the user's personal computer.

Categorization

- **Volatility**: Low
- **Frequency**: High
- **Criticality**: High
- **Probability of Defects**: Medium
- **Risk**: High

3.2.5.3.4   Normal Path: Electronic Auction Glossary Displayed

Path Requirement

The GPM shall enable users to display a glossary of electronic auction terms.

Externals

- Actor (Client)

Preconditions

- The GPM displays on the "GPM Home" webpage on the browser of the user's personal computer.

Interactions

1. The user uses the "GPM Home" webpage to send a "Display Electronic Auction Glossary" request to the GPM.
2. The GPM shall respond by opening the "Electronic Auction Glossary" webpage on the browser of the user's personal computer.
3. After reading the Electronic Auction Glossary, the user uses the "Electronic Auction Glossary" webpage to send a "Close Current Webpage" request to the GPM.

Postconditions

- The GPM displays on the "GPM Home" webpage on the browser of the user's personal computer.

Categorization

- **Volatility**: Low
- **Frequency**: High
- **Criticality**: High
- **Probability of Defects**: Medium
- **Risk**: High

3.2.5.3.5 Normal Path: User Agreement Displayed

Path Requirement

The GPM shall enable users to display the user agreement.

Externals

- Actor (Client)

Preconditions

- The GPM displays on the "GPM Home" webpage on the browser of the user's personal computer.

Interactions
1. The user uses the "GPM Home" webpage to send a "Display User Agreement" request to the GPM.
2. The GPM shall respond by opening the "User Agreement" webpage on the browser of the user's personal computer.
3. After reading the User Agreement, the user uses the "User Agreement" webpage to send a "Close Current Webpage" request to the GPM.

Postconditions

- The GPM displays on the "GPM Home" webpage on the browser of the user's personal computer.

Categorization

- **Volatility**: Low
- **Frequency**: High
- **Criticality**: High
- **Probability of Defects**: Medium
- **Risk**: High

3.2.5.3.6 Normal Path: Privacy Policy Displayed

Path Requirement

The GPM shall enable users to display the privacy policy.

Externals

- Actor (Client)

Preconditions

- The GPM displays on the "GPM Home" webpage on the browser of the user's personal computer.

Interactions
1. The user uses the "GPM Home" webpage to send a "Display Privacy Policy" request to the GPM.
2. The GPM shall respond by opening the "Privacy Policy" webpage on the browser of the user's personal computer.
3. After reading the privacy policy, the user uses the "Privacy Policy" webpage to send a "Close Current Webpage" request to the GPM.

Postconditions

- The GPM displays on the "GPM Home" webpage on the browser of the user's personal computer.

Categorization

- **Volatility**: Low
- **Frequency**: High
- **Criticality**: High

- **Probability of Defects**: Medium
- **Risk**: High

3.2.5.4 Use Case: User Displays Own Feedback History

Use Case Requirement

The GPM shall enable users to review feedback made about them by others.

Business Justification

- Buyers want to know what sellers have recorded about them.
- Sellers want to know what winning buyers have recorded about them.

Requirements Trace

- AVS QG-U-7) Display Own Feedback History

Use Case Paths

- Normal:
    – History Reviewed
- Exceptional:
    – None

3.2.5.4.1 Normal Path: History Reviewed

Path Requirement

The GPM shall enable a user to review their own feedback history.

Externals

- User (Client)

Preconditions

- The GPM displays on the "GPM Home" webpage on the browser of the user's personal computer.

Interactions

1. The user uses the "GPM Home" webpage to send a "Display Feedback History" request to the GPM.
2. The GPM shall respond by displaying the user's "Feedback History" webpage containing the following information on the browser of the user's personal computer:
    – The user's alias and identifier
    – The number of comments
    – A table summarizing comments by:
        – Type (Positive, Neutral, Negative, Total)
        – When made (Past week, past month, past 6 months)
    – For each comment:
        – The submitting user's alias and identifier
        – The date and time of the comment
        – The type of comment (Positive, Neutral, Negative)
        – The comment
3. The user uses the "Feedback History" webpage to send a "History Reviewed" message to the GPM.

Postconditions

- The GPM displays on the "GPM Home" webpage on the browser of the user's personal computer.

Categorization

- **Volatility**: Medium
- **Frequency**: Medium
- **Criticality**: Medium
- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.5.5   Use Case: User Obtains User Email Address

Use Case Requirement

The GPM shall enable users to obtain the email address of other users.

Business Justification

- Buyers need to contact sellers.
- Sellers need to contact winning buyers to arrange payment.

Requirements Trace

- AVS QG-U-8) Obtain Email Address

Use Case Paths

- Normal:
    - Email address obtained
- Exceptional:
    - User not found

3.2.5.5.1   Normal Path: Email Address Obtained

Path Requirement

The GPM shall enable a user to obtain the email addresses of active users.

Externals

- User (Client)

Preconditions

- The GPM displays on the "GPM Home" webpage on the browser of the user's personal computer.
- The GPM records the user having the desired email address as active.

Interactions

1. The user uses the "GPM Home" webpage to send a "Display Email Address" request to the GPM.
2. The GPM shall respond by displaying the "Display Email Address" webpage requesting the following information on the browser of the user's personal computer:
    - The "Enter User Alias" message
    - The user's alias
3. The user uses the "Display Email Address" webpage to send the following information to the GPM:
    - The alias of the user of the desired email address
4. The GPM shall respond by displaying the "Email Address" webpage requesting the following information on the browser of the user's personal computer:
    - The "Requested Email Address" message
    - The user's email address
5. The user uses the "Email Address" webpage to acknowledge the email address to the GPM.

Postconditions

- The GPM displays on the "GPM Home" webpage on the browser of the user's personal computer.

Categorization

- **Volatility**: Medium
- **Frequency**: Medium
- **Criticality**: Medium
- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.5.5.2 Exceptional Path: User Not Found

Path Requirement

The GPM shall enable a user to review their own feedback history.

Externals

- User (Client)

Preconditions

- The GPM displays on the "GPM Home" webpage on the browser of the user's personal computer.
- The GPM does not record the user having the desired email address as active.

Interactions

1. The user uses the "GPM Home" webpage to send a "Display Email Address" request to the GPM.
2. The GPM shall respond by displaying the "Display Email Address" webpage requesting the following information on the browser of the user's personal computer:
   - The "Enter User Alias" message
   - The user's alias
3. The user uses the "Display Email Address" webpage to send the following information to the GPM:
   - The alias of the user of the desired email address
4. After verifying that no active user account exists for the desired user alias, the GPM shall respond by displaying the "Email Address Failed" webpage containing the following information on the browser of the user's personal computer:
   - The "User Not Found" message
5. The user uses the "Email Address Failed" webpage to acknowledge the invalid user alias to the GPM.

Postconditions

- The GPM displays on the "GPM Home" webpage on the browser of the user's personal computer.

Categorization

- **Volatility**: Medium
- **Frequency**: Medium
- **Criticality**: Medium
- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.5.6 Use Case: User Reviews Personal Account Status

Use Case Requirement

The GPM shall enable users to review the status of their accounts.

Business Justification

- Users want to know their current account status, especially how much they owe.

Requirements Trace

- AVS OG-U-TBD) Review Personal Account Status

Use Case Paths

- Normal:
    - Account Status Displayed
- Exceptional:
    - None

3.2.5.6.1 Normal Path: Account Status Displayed

Path Requirement

The GPM shall enable users to display the status of their individual accounts.

Externals

- User (Client)

Preconditions

- The GPM displays the "Seller" webpage on the browser on the user's personal computer.

Interactions

1. The user uses the "Seller" webpage to send a "Review Account Status" request to the GPM.
2. The GPM shall respond by displaying the seller's "Account Status" webpage containing the following information on the browser of the user's personal computer:
    - User alias
    - Account status (open, suspended, closed)
    - For each auction for which fees are due:
        - The item being auctioned
        - The title of the item being auctioned
        - The state of the auction (open, closed, cancelled)
        - The start date of the auction
        - The end date and time of the auction
        - The auction specific fees
    - The current balance due.
    - The balance that is 30 days past due.
    - The balance that is 60 days past due.
    - The balance that is 90 days past due.
3. The user uses the "Account Status" webpage to acknowledge reviewing his/her account to the GPM.

Postconditions

- The GPM displays the "Seller" webpage on the browser on the user's personal computer.

Categorization

- **Volatility**: Medium
- **Frequency**: Low
- **Criticality**: Medium
- **Probability of Defects**: Medium

- **Risk**: Medium

3.2.5.7 Use Case: User Inquires Regarding Personal Account

Use Case Requirement

The GPM shall enable users to inquire regarding their accounts including status, current balance, and payment history.

Business Justification

- Sellers want to request answers if their payment history does not match the payments they have made.

Requirements Trace

- AVS OG-U-TBD) User Inquires Regarding Personal Account

Use Case Paths

- Normal:
    - Inquiry Successfully Made
- Exceptional:
    - None

3.2.5.7.1 Normal Path: Inquiry Successfully Made

Path Requirement

The GPM shall enable users to send email inquiries regarding their accounts.

Externals

- User (Client)

Preconditions

- The GPM displays the "Seller" webpage on the browser on the user's personal computer.

Interactions

1. The user uses the "Seller" webpage to send a "Make Account Inquiry" request to the GPM.
2. The GPM shall respond by displaying the "Make Account Inquiry" webpage containing the following information on the browser of the user's personal computer:
    - The "Make Account Inquiry" message
    - The seller's alias
3. The user uses the "Make Account Inquiry" webpage to send an "Account Inquiry" request containing the following information to the GPM:
    - The seller's inquiry
4. The GPM shall respond by displaying the "Account Inquiry Registered" webpage containing the following information on the browser of the user's personal computer:
    - The "Account Inquiry Registered" message
    - The seller's alias
    - The seller's inquiry
5. The user uses the "Account Inquiry Registered" webpage to acknowledge that the inquiry was registered to the GPM.

Postconditions

- The GPM has registered the inquiry regarding the user's account.

Categorization

- **Volatility**: Medium

- **Frequency**: Low
- **Criticality**: Medium
- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.5.8 Use Case: GPM Emails Invoice

Use Case Requirement

When requested by an accountant, the GPM shall email monthly invoices to sellers who have an outstanding balance of at least minimum billing balance and who have not provided a credit card.

Business Justification

- Invoices are the source of income from the GPM.

Requirements Trace

- AVS OG-AC-2) Invoice Sellers

Use Case Paths

- Normal:
    - Balance Charged to Credit Card
    - Balance Due from User
- Exceptional:
    - Outstanding balance less than minimum billing balance

3.2.5.8.1 Normal Path: Balance Charged To Credit Card

Path Requirement

If the user has an outstanding balance of at least the minimum billing balance and has provided a credit card, then the GPM shall email a monthly invoice to the user that notifies the user that the credit card was charged.

Externals

- Accountant (Client)
- User (Server)

Preconditions

- The seller has an outstanding balance of at least the minimum billing balance
- The seller has provided a credit card.
- The accountant has requested that monthly invoices be sent.

Interactions

1. The GPM shall email a monthly invoice containing the following information to the seller:
    - The seller's name
    - The seller's alias
    - The invoice month and year
    - For each auction that closed in the month covered by the invoice:
        - The auction number
        - The auction type (Regular, Reserve, Dutch)
        - The item title
        - The auction closing date and time
        - The listing fee

- − The final sale fee
- − The total auction fee
- − The service fees (if any):
  - − Past due service fee
  - − Insufficient funds service fee
  - − Credit card declined fee
- − The total seller fees due:
  - − Currently due
  - − 30 days past due
  - − 60 days past due
  - − 90 days past due
- − The "Fees Deducted from Credit Card" message.

Postconditions

- • The GPM emailed an invoice to the user that notified the user that the user's credit card has been charged the outstanding balance.

Categorization

- • **Volatility**: Medium
- • **Frequency**: High
- • **Criticality**: High
- • **Probability of Defects**: Medium
- • **Risk**: High

3.2.5.8.2 Normal Path: Balance Due From User

Path Requirement

If the user has an outstanding balance of at least the minimum billing balance and has not provided a credit card, then the GPM shall email a monthly invoice to the user requesting payment.

Externals

- • Accountant (Client)
- • User (Server)

Preconditions

- • The seller has an outstanding balance of at least the minimum billing balance
- • The seller has not provided a credit card.
- • The accountant has requested that monthly invoices be sent.

Interactions

2. The GPM shall email a monthly invoice containing the following information to the seller:
   - − The "Pay Monthly Invoice" message.
   - − The seller's name
   - − The seller's alias
   - − The invoice month and year
   - − For each auction that closed in the month covered by the invoice:
     - − The auction number
     - − The auction type (Regular, Reserve, Dutch)

- The item title
- The auction closing date and time
- The listing fee
- The final sale fee
- The total auction fee
- The service fees (if any):
  - Past due service fee
  - Insufficient funds service fee
  - Credit card declined fee
- The total seller fees due:
  - Currently due
  - 30 days past due
  - 60 days past due
  - 90 days past due

Postconditions

- The GPM emailed an invoice to the user requesting payment of the outstanding balance.

Categorization

- **Volatility**: Medium
- **Frequency**: High
- **Criticality**: High
- **Probability of Defects**: Medium
- **Risk**: High

3.2.5.8.3 Exceptional Path: Outstanding Balance Less than Minimum Billing Balance

Path Requirement

The GPM shall not email monthly invoices to sellers who have an outstanding balance of less than the minimum billing balance.

Externals

- Accountant (Client)

Preconditions

- The seller has an outstanding balance of less than the minimum billing balance
- The accountant has requested that monthly invoices be sent.

Interactions

1. None.

Postconditions

- None.

Categorization

- **Volatility**: Medium
- **Frequency**: High
- **Criticality**: Low
- **Probability of Defects**: Low

- **Risk**: Medium

3.2.5.9 Use Case: GPM Requests Credit Card Authorization

Use Case Requirement

When requested by an accountant, the GPM shall charge the credit cards of sellers who have an outstanding balance of at least the minimum billing balance and who have provided a credit card.

Business Justification

- Invoices are the source of income from the GPM.
- Credit cards are a convenience to users.
- Credit card debits occur more rapidly than check payments due to email invoices.

Requirements Trace

- AVS OG-AC-2) Invoice Sellers

Use Case Paths

- Normal:
    - Authorization approved
- Exceptional:
    - Outstanding balance less than the minimum billing balance
    - Authorization declined

3.2.5.9.1 Normal Path: Authorization Approved

Path Requirement

If the user has an outstanding balance of at least the minimum billing balance and has provided a credit card, then the GPM shall bill their credit card for the outstanding balance.

Externals

- Accountant (Client)
- Authorization Processor Gateway (Server)

Preconditions

- The accountant has requested that monthly invoices be sent.
- The seller has an outstanding balance of at least the minimum billing balance.
- The seller has provided a credit card.
- The seller's credit card has at least the current balance due available.

Interactions

1. The GPM shall send a credit card authorization request containing the following information to the Authorization Processor Gateway:
    - A sequence number
    - The credit card number
    - The credit card expiration date
    - The name on the credit card
    - The outstanding balance to be charged to the card.
2. The Authorization Processor Gateway sends an authorization approved response containing the following information to the GPM:
    - A sequence number

> - An authorization number
> - The amount approved

Postconditions

- The GPM has obtained authorization from the Authorization Processor Gateway.
- The GPM has recorded the transaction in the seller's account, whereby the transaction includes:
  - The date and time
  - The debit of the outstanding balance.
  - The source of the funds (the seller's credit card).

Categorization

- **Volatility**: Medium
- **Frequency**: High
- **Criticality**: High
- **Probability of Defects**: Medium
- **Risk**: High

3.2.5.9.2 Exceptional Path: Outstanding Balance Less than Minimum Billing Balance

Path Requirement

If the user has an outstanding balance of less than the minimum billing balance, then the GPM shall not bill their credit card.

Externals

- Accountant (Client)

Preconditions

- The accountant has requested that monthly invoices be sent.
- The seller has an outstanding balance of less than the minimum billing balance
- The seller has provided a credit card.

Interactions

1. None.

Postconditions

- None.

Categorization

- **Volatility**: Medium
- **Frequency**: High
- **Criticality**: Low
- **Probability of Defects**: Low
- **Risk**: Medium

3.2.5.9.3 Exceptional Path: Authorization Declined

Path Requirement

If the Authorization Processor Gateway declines the credit card when the GPM attempts to authorize payment for the user's outstanding balance, then the GPM shall request the billing clerk to send a paper invoice.

Externals

- Accountant (Client)
- Authorization Processor Gateway (Server)

Preconditions

- The accountant has requested that monthly invoices be sent.
- The seller has an outstanding balance of at least the minimum billing balance.
- The seller has provided a credit card.
- The credit card does not have sufficient funds to cover the outstanding bill.

Interactions

1. The GPM shall send a credit card authorization request containing the following information to the Authorization Processor Gateway:
   - A sequence number
   - The credit card number
   - The credit card expiration date
   - The name on the credit card
   - The outstanding balance to be charged to the card.
2. The Authorization Processor Gateway sends an authorization declined response containing the following information to the GPM:
   - A sequence number
3. The GPM shall respond by emailing a credit card declined notification containing the following information to the seller:
   - The "Credit Card Declined" message
   - The seller's name
   - The seller's alias
   - The invoice month and year
   - The amount for which authorization was requested
   - The resulting credit card declined fee that was billed to the user's account
   - The total amount now due

Postconditions

- The GPM has not obtained authorization from the Authorization Processor Gateway.
- The GPM has emailed a Credit Card Declined Notification to the user.
- The GPM has charged the "Credit Card Declined" fee to the user's account.
- The GPM has requested a Billing Clerk to send a paper invoice to the user.

Categorization

- **Volatility**: Medium
- **Frequency**: Low
- **Criticality**: High
- **Probability of Defects**: High
- **Risk**: Medium

3.2.6   User Support Agent

The subsection specifies the functional requirements primarily associated with user support agents.

Definition

A *user support agent* is the role played by an employee who provides a human interface for the GPM to the users.

Responsibilities

A user support agent has the following responsibilities:

- Handle user inquiries.
- Sanction users who violate the user agreement.

Required Capabilities

A user support agent needs the following required technical expertise, experience, and training to effectively interact with GPM:

- Good people skills for dealing with users.

Use Case Diagram
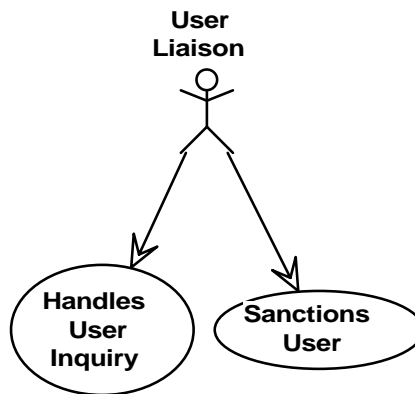
Figure 11: User Support Agent Use Case Diagram

Use Cases

- User Support Agent Handles User Inquiry
- User Support Agent Sanctions User

3.2.6.1 Use Case: User Support Agent Handles User Inquiry

Use Case Requirement

The GPM shall enable user support agents to handle user inquiries.

Business Justification

- Sellers must be able to request clarification as to why payments have not been credited or why a questionable amount has been credited to their accounts.

Requirements Trace

- AVS OG-UL-1) Handle User Inquiries

Use Case Paths

- Normal:
  - Inquiry Handled
- Exceptional:
  - None

3.2.6.1.1 Normal Path: Inquiry Handled

Path Requirement

The GPM shall enable a user support agent to handle an inquiry from a user.

Externals

- User Support Agent (Client)

Preconditions

- The GPM displays the "User Support Agent" screen on the user support agent's personal computer.

Interactions

1. The user support agent uses the "User Support Agent" screen to send a "Handle User Inquiry" request to the GPM.
2. The GPM shall respond by displaying a "User Inquiry" screen containing the following information on the user support agent's personal computer:
   - For each user inquiry in the set of the next ten user inquiries to be handled:
     - The user's name
     - The user's alias
     - The user's inquiry
     - The date and time of the user's inquiry
3. After selecting a user's inquiry and handling the inquiry (optionally execute Use case: Receiving Clerk Records Seller Payment), the user support agent uses the "User Inquiry" screen to send the following information to the GPM:
   - The user support agent's answer to the user's inquiry
4. The GPM shall respond by emailing the following information to the user:
   - The "User Inquiry Response" message
   - The user's name
   - The user's alias
   - The date and time of the user's inquiry
   - The user's inquiry
   - The user support agent's answer to the user's inquiry
5. The GPM shall respond by displaying a "User Inquiry Handled" screen on the user support agent's personal computer.
6. The user support agent uses the "User Inquiry Handled" screen to acknowledge the handling of the user inquiry to the GPM.

Postconditions

- The GPM has emailed the user an answer to his/her inquiry from the user support agent.

Categorization

- **Volatility**: Medium
- **Frequency**: Medium
- **Criticality**: High
- **Probability of Defects**: Medium
- **Risk**: High

3.2.6.2 Use Case: User Support Agent Sanctions User

Use Case Requirement

The GPM shall enable user support agents to suspend or ban users who violate the user agreement.

Business Justification

- GPM needs a way to deter and remove users who violate the user agreement.

Requirements Trace

- AVS OG-UL-2) Sanction Users (Temporary Suspension)
- AVS OG-UL-3) Sanction Users (Permanent Banning)

Use Case Paths

- Normal:
  - User Temporarily Suspended
  - User Permanently Banned
- Exceptional:
  - User Account Closed

3.2.6.2.1 Normal Path: User Temporarily Suspended

Path Requirement

The GPM shall enable a user support agent to temporarily suspend a user who violates certain parts of the user agreement.

Externals

- User Support Agent (Client)

Preconditions

- The GPM displays the "User Support Agent" screen on the user support agent's personal computer.
- The user has violated the user agreement in a manner justifying temporary suspension.

Interactions

1. The user support agent uses the "User Support Agent" screen to send a "Sanction User" request to the GPM.
2. The GPM shall respond by displaying the "Sanction User" screen requesting the following information on the user support agent's personal computer:
   - The user's alias
3. The user support agent uses the "Sanction User" screen to send the following information to the GPM:
   - The user's name
   - The user's alias
   - The part of the user agreement violated by the user.
   - The circumstances (i.e., date, time, user action) of the violation.
   - The sanction (temporary suspension).
   - The duration of suspension.
4. The GPM shall respond by emailing a suspension notification containing the following information to the user:
   - The "User Suspended" message including the duration.
   - The user's name
   - The user's alias

- The part of the user agreement violated by the user.
- The circumstances (i.e., date, time, user action) of the violation.

5. The GPM shall respond by displaying a "User Sanctioned" screen containing the following information on the user support agent's personal computer:
    - The "User Suspended" message including the duration.
    - The user's name
    - The user's alias
    - The part of the user agreement violated by the user.
    - The circumstances (i.e., date, time, user action) of the violation.

6. The user support agent uses the "User Sanctioned" screen to acknowledge the sanctioning of the user to the GPM.

Postconditions

- The GPM records the status of the user as suspended until the suspension duration is over.
- The GPM has emailed the user a sanction notification from the user support agent.

Categorization

- **Volatility**: Medium
- **Frequency**: Low
- **Criticality**: Medium
- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.6.2.2 Normal Path: User Permanently Banned

Path Requirement

The GPM shall enable a user support agent to permanently ban a user who violates certain parts of the user agreement.

Externals

- User Support Agent (Client)

Preconditions

- The GPM displays the "User Support Agent" screen on the user support agent's personal computer.
- The user has violated the user agreement in a manner justifying permanent banning.

Interactions

1. The user support agent uses the "User Support Agent" screen to send a "Sanction User" request to the GPM.
2. The GPM shall respond by displaying the "Sanction User" screen requesting the following information on the user support agent's personal computer:
    - The user's alias
3. The user support agent uses the "Sanction User" screen to send the following information to the GPM:
    - The user's name
    - The user's alias
    - The part of the user agreement violated by the user.
    - The circumstances (i.e., date, time, user action) of the violation.
    - The sanction (permanent banning).

4. The GPM shall respond by emailing a suspension notification containing the following information to the user:
   – The "User Banned" message
   – The user's name
   – The user's alias
   – The part of the user agreement violated by the user.
   – The circumstances (i.e., date, time, user action) of the violation.

5. The GPM shall respond by displaying a "User Sanctioned" screen containing the following information on the user support agent's personal computer:
   – The "User Banned" message
   – The user's name
   – The user's alias
   – The part of the user agreement violated by the user.
   – The circumstances (i.e., date, time, user action) of the violation.

6. The user support agent uses the "User Sanctioned" screen to acknowledge the sanctioning of the user to the GPM.

Postconditions

- The GPM records the status of the user as banned.
- The GPM has emailed the user a sanction notification from the user support agent.

Categorization

- **Volatility**: Medium
- **Frequency**: Low
- **Criticality**: Medium
- **Probability of Defects**: Medium
- **Risk**: Medium

3.2.6.2.3 Exceptional Path: User Account Closed

Path Requirement

The GPM shall enable a user support agent to record the permanent banning of a user, even if the user's account is already closed.

Externals

- User Support Agent (Client)

Preconditions

- The GPM displays the "User Support Agent" screen on the user support agent's personal computer.
- The user has violated the user agreement in a manner justifying permanent banning.

Interactions

1. The user support agent uses the "User Support Agent" screen to send a "Sanction User" request to the GPM.
2. The GPM shall respond by displaying the "Sanction User" screen requesting the following information on the user support agent's personal computer:
   – The user's alias
3. The user support agent uses the "Sanction User" screen to send the following information to the GPM:
   – The "User Account Closed" message

- − The user's alias
- − The part of the user agreement violated by the user.
- − The circumstances (i.e., date, time, user action) of the violation.
- − The sanction (permanent banning).

4. The GPM shall respond by emailing a suspension notification containing the following information to the user:
   - − The user's alias
   - − The part of the user agreement violated by the user.
   - − The circumstances (i.e., date, time, user action) of the violation.
   - − The sanction (permanent banning).

5. The GPM shall respond by displaying a "User Sanctioned" screen containing the following information on the user support agent's personal computer:
   - − The "User Sanctioned" message
   - − The user's alias
   - − The part of the user agreement violated by the user.
   - − The circumstances (i.e., date, time, user action) of the violation.
   - − The sanction (permanent banning).

6. The user support agent uses the "User Sanctioned" screen to acknowledge the sanctioning of the user to the GPM.

Postconditions

- The GPM records the status of the user as banned.
- The GPM has emailed the user a sanction notification from the user support agent.

Categorization

- **Volatility**: Medium
- **Frequency**: Low
- **Criticality**: Medium
- **Probability of Defects**: Medium
- **Risk**: Medium

4 Data Requirements

This section specifies the data requirements on the GPM system.

4.1 Billing Cycle

4.2 Fee Schedule

This subsection specifies the following data requirements associated with the "fee schedule" data component:

4.2.1 Listing Fees

Listing fees charged to users for placing a listing with the GPM shall include the following:

- Buyer Listing Fees:
  - Reverse Auction
  - Wish-To-Buy Notification.

- Seller Listing Fees:
  - Direct Sale.
  - Dutch Auction.
    - The listing fee for a Dutch auction based on the following formula:
      - The per item fee.
      - The maximum listing fee.
  - Yankee Auction.
    - The listing fee for each of the following ranges of minimum bid (Yankee auction) or initial price per item (direct sale):
      - $0.01 - $9.99.
      - $10.00 - $24.99.
      - $25.00 - $49.99.
      - $50.00 - $499.99.
      - $500.00 - $4,999.99.
      - $5,000.00 and up.

4.2.2 Purchase Fees

Purchase fees per item purchased for the following ranges:

Final Purchase Price in USD	Initial Purchase Fee
$0.01 - $9.99	
$10.00 - $24.99	
$25.00 - $49.99	
$50.00 - $499.99	
$500.00 - $4,999.99	
$5,000.00 and up	

All fees are positive.

For a single type of auction, the fee for a range is less than or equal to the fee for the next higher range.

4.2.3   Service Fees

Users can be charged the following service fees:

- The account balance past due service fee.
- The insufficient funds service fee.
- The credit card declined fee.

Listing Fees:

The listing fee for each of the following ranges of minimum bid (Yankee auction) or initial price per item (direct sale):

$0.01 - $9.99.

$10.00 - $24.99.

$25.00 - $49.99.

$50.00 - $499.99.

$500.00 - $4,999.99.

$5,000.00 and up.

The listing fee for a Dutch auction based on the following formula:

The per item fee.

The maximum listing fee.

Final Sale Fees:

The final sales fee per item sold for of the following ranges:

$0.01 - $9.99.

$10.00 - $24.99.

$25.00 - $49.99.

$50.00 - $499.99.

$500.00 - $4,999.99.

$5,000.00 and up.

4.3   Messages

The "Invalid Fee" message including the fee and the value entered by the accountant. For, example:

"You entered <value> for <fee identifier>, but fees may not be negative."

"You entered <value> for <fee identifier>, but the fee must be greater than or equal to $2.00, which is the fee for the next lower range."

4.4   Reports

This section specifies the data requirements concerning reports generated by the GPM system.

4.4.1   Feedback Summary Report

The feedback summary report shall contain the following information:

- The title of the report.
- The date and time that the report was generated.
- Month and year of the transactions (i.e., purchases) covered by the report
- Summary information:
  - The total number of feedback comments registered.
  - The total number of positive comments registered.
  - The total number of neutral comments registered.
  - The total number of negative comments registered.
- Feedback about successful buyers:
  - The total number of feedback comments registered.
  - The total number of positive comments registered.
  - The total number of neutral comments registered.
  - The total number of negative comments registered.
- Feedback about successful sellers:
  - The total number of feedback comments registered.
  - The total number of positive comments registered.
  - The total number of neutral comments registered.
  - The total number of negative comments registered.
- Excessive negative feedback:
  - The total number of active users with four or more negative comments in the 90 days prior to the generation of the report.
  - A list of these active users receiving excessive negative feedback including:
    - Name.
    - Identifier.
    - Total number of negative comments in the previous 90 days.
    - Number of negative comments as a buyer.
    - Number of negative comments as a seller.

4.4.2   Fees Summary Report

4.4.3   Invoice Summary Report

The invoice summary report shall contain the following information:

- The title of the report.
- The date and time that the report was generated.
- Month and year of the invoices covered by the report
- For invoices sent during the month:
  - The number of invoices sent
  - The total amount billed
  - The number of payments received
  - The total amount received
- For invoices sent during the previous quarter:

- The number of invoices sent
- The total amount billed
- The number of payments received
- The total amount received
- The total amount past due

4.4.4   Listings Summary Report

The listings summary report shall contain the following information:

- Title of the report
- Date and time that the report was generated
- Month and year of the listings covered by the report
- For each listing that was open during the month and year, sorted first by listing type, second by listing status (open, closed), and third by listing opening date:
  - The listing identifier
  - The seller identifier
  - The following date information:
    - Listing open date
    - Listing duration
    - Listing close date
  - The following item information:
    - Item identifier
    - Item description
    - Item categorization
    - Item Quantity
  - The following bid information:
    - Optional reserve price
    - Minimum starting bid
    - Maximum bid increment
    - Highest bid
    - Winning bid
    - Winning buyer

4.4.5   User Summary Report

The user summary report shall contain the following information:

- Title of the report
- Date and time that the report was generated
- Month and year of the listings covered by the report
- For each user who has a status of TBD:
  - TBD

4.5   User Account Information

4.6   User Restrictions

Maximum Account Balance

Maximum Past Due Balance

5 System Quality Requirements

This section specifies the required system quality factors that are not related to the specific functional requirements documented in the use case model.

5.1 Accessibility

This subsection specifies the following requirements associated with the degree to which the system must be accessible to people with disabilities:

- ACC-1) Any graphical user interfaces of the GPM shall be usable by persons with color blindness.
- ACC-2) Any graphical user interfaces of the GPM shall use an adequate font size to be usable by persons with limited visual acuity.

5.2 Auditability

This subsection specifies the following requirements associated with the degree to which the system must support independent auditing of its transactions and finances:

- AUD-1) The GPM shall maintain a record for 1 year of each invoice.
- AUD-2) The GPM shall maintain a record for 1 year of each payment.
- AUD-3) The GPM shall maintain a record for 1 year of each auction including:
  - Auction identifier
  - Item title and description
  - Auction type
  - Seller
  - Bid history
  - Auction results
  - Start and end dates and times
  - Winning buyers (if any)
  - Winning bid(s)
- AUD-4) The GPM shall maintain a record for 1 year of each user inquiry and response.

5.3 Branding

This subsection specifies the following requirements associated with the degree to which the system must support the brand of GPMC.

5.4 Configurability

This subsection specifies the following requirements associated with the degree to which the system must exist in multiple simultaneous configurations or variants:

5.4.1 Variant Capabilities

- There are no requirements for multiple variants of the GPM.

5.4.2 Internationalization

- There are no requirements for internationalization envisioned because the initial releases of the GPM will be restricted to users within the United States.

5.4.3 Personalization

- The degree of personalization is an open issue that has not been resolved.

5.5   Correctness

This subsection specifies the following requirements concerning the degree to which the system can contain defects and still be acceptable to the customer.

5.5.1   Latent Defects

This subsection specifies the following requirements concerning the maximum number of allowable latent defects in released work products.

- COR-1) The maximum number of latent bugs per unit of software shall not exceed TBD for any release.
- COR-2) The maximum total number of known latent bugs by category[9] shall not exceed:
  - Minor = TBD.
  - Significant = TBD.
  - Critical = TBD.
- COR-3) The maximum number of tests that can fail when the system is shipped shall not exceed TBD.

5.5.2   Accuracy

This subsection specifies the following requirements concerning the degree of correctness of the system's outputs:

- COR-4) Values of money shall be correct to the nearest penny.
- COR-5) Values of time shall be correct to the nearest second.

5.5.3   Precision

This subsection specifies the following requirements concerning the resolution of the system's numerical outputs:

- COR-6) Values of money shall be precise to the nearest penny.
- COR-7) Values of time shall be precise to the nearest second.

5.5.4   Timeliness

This subsection specifies the following requirements concerning the degree to which the system must ensure that its persistent information is current (i.e., up-to-date):

- COR-8) When one user updates some data, the system shall ensure that other users shall automatically see the update within 2 seconds.
- COR-9) The GPM shall not return requested information to an external that is more than one second obsolete.
- COR-10) The system shall automatically transfer "old" information from on-line storage to off-line archives after TBD days.
- COR-11) The system shall permanently delete[10] "obsolete" information from all storage after TBD days.

---

[9] Critical defects prevent the use of essential system capabilities and have no work-arounds. Significant defects do have work-arounds. Minor defects are merely inconvenient or annoying to the user.

[10] Note that these requirements should not conflict with any auditability requirements.

5.6 Efficiency

This subsection specifies the following requirements associated with the degree to which the system effectively uses its resources:

- EFF-1) The GPM shall not require users to permanently download software to their computers.

5.7 Extensibility

This subsection specifies the following requirements associated with the degree to which the system can be modified to meet changing requirements or goals.

- EXT-1) The GPM shall be easily extendable to enable sellers to sell services as well as goods.
- EXT-2) The GPM shall be easily extendable to enable buyers to obtain insurance.
- EXT-3) The GPM shall be easily extendable to enable buyers to place their seller payments in escrow until satisfactory delivery.
- EXT-4) The GPM shall be easily extendable to the buyer to use their credit card to buy electronic money from GPM, which is then used to pay the seller.
- EXT-5) The GPM shall be easily extendable to allow the seller to automatically relist the auction if there are no winners.
- EXT-6) The GPM shall be easily extendable to sellers to specify a take it price.
- EXT-7) The GPM shall be easily extendable to allow fixed price sales (i.e., minimum bid = take it price).

5.8 Installation

This subsection specifies the following usability requirements associated with the ease with which the system can be installed.

- INS-1) The typical user shall not average more than 5 minutes to install or upgrade any required GPM software on his/her personal computer.
- INS-2) The user and employee shall be clearly informed about all system requirements for successfully installing any GPM software (e.g., required browser, operating system, memory, etc.).
- INS-3) It shall not average more than 5 minutes to install or upgrade the software on employee's personal computers.
- INS-4) It shall not average more than 10 minutes to install or upgrade the software on the GPM servers.

5.9 Interoperability

This subsection specifies the following requirements associated with the ease with which the system can be integrated with other system (e.g., browsers, legacy applications, and required databases).

- The GPM shall interoperate with the following browsers:
  – IOP-1) Internet Explorer 4.0
  – IOP-2) Netscape Navigator 4.0

5.10 Maintainability

This subsection specifies the following requirements associated with the ease with which the system can be maintained:

- M-1) The GPM shall permit the swapping and upgrade of hardware without down time.
- M-2) The GPM shall permit the upgrade of software without down time.
- M-3) The Mean Time To Fix (MTTF) shall not exceed one person day.

5.11 Operational Availability

This subsection specifies the following requirements associated with the percent of time that the system must function correctly.

- OA-1) By release 0, the GPM shall provide actors with a minimum operational availability of 99%.
- OA-2) By release 1, the GPM shall provide actors with a minimum operational availability of 99.9%.
- OA-3) By release 2, the GPM shall provide users a minimum operational of 99.99%.
- OA-4) By release 3, the GPM shall provide actors a minimum operational availability of 99.99%.

5.12 Performance

This subsection specifies the following requirements associated with the speed with which the system shall function.

5.12.1 Capacity

This subsection specifies the following requirements concerning the minimum number of objects that the system can support:

- PER-1) The system shall support a minimum of 10,000 simultaneous open sales.
- PER-2) The system shall support a minimum of 50,000 sales per year.
- PER-3) The system shall support a minimum of 50 employees.
- PER-4) The system shall support a minimum of 500,000 users.
- PER-5) The system shall support a minimum of 10,000 simultaneous interactions.

5.12.2 Latency

This subsection specifies the following requirements concerning the maximum time that is permitted for the system to execute specific tasks (i.e., system operations) or use case paths end to end:

- PER-6) The typical seller shall be able to register an item for auction within 10 minutes.
- PER-7) The typical buyer shall be able to find relevant items (if any) within 5 minutes.
- PER-8) The typical buyer shall be able to place a bid within 3 minutes.

5.12.3 Response Time

This subsection specifies the following requirements concerning the maximum time that is permitted for the system to respond to requests:

- PER-9) All system responses shall occur within 30 seconds.

5.12.4 Throughput

This subsection specifies the following requirements concerning how many executions of a given system operation or use case path must the system be able execute in a unit of time:

- TBD

5.13 Portability

This subsection specifies the following requirements associated with the ease with which the system can be moved from one environment (e.g., hardware, operating system) to another.

- The GPM shall enable users to use the following environments (e.g., platform and operating system) to interact with the GPM:
  - User Personal Computer:
    - POR-1) PC with minimum of Pentium I chip, 16 meg of RAM, and a 28.8 K modem

- − Operating Systems:
  - − POR-2) Windows'95
  - − POR-3) Windows'98
  - − POR-4) Windows'NT

5.14 Reliability

This subsection specifies the following requirements associated with the reliability (e.g., mean time between failures, number of failures per unit time) of the system.

- REL-1) The mean time between failures (MTBF) shall exceed 3 months.

5.15 Reusability

This subsection specifies the following requirements associated with the degree to which the system can be used for purposes other than originally intended (e.g., as part of other applications).

- REU-1) The GPM shall incorporate a database continuous availability layer.
- REU-2) The GPM shall reuse common classes such as name, address, telephone number, and currency.
- REU-3) The GPM shall reuse software for sending emails.

5.16 Robustness

This subsection specifies the following requirements associated with the degree to which the system continues to properly function under abnormal circumstances.

- ROB-1) The GPM should gracefully handle invalid input (i.e., detect invalid input, request valid input, and not crash) from all externals:
  - − The human actors.
  - − The Authorization Processor Gateway.
- ROB-2) The GPM should gracefully handle hardware failures (i.e. provide hot failover, notify the system operator, and not crash).

5.17 Safety

This subsection specifies the following requirements associated with the degree to which the system does not directly or indirectly (e.g., via inactivity) cause accidental harm to life or property (e.g., loss of money or data).

- SAF-1) The GPM shall not accidentally lose user account information.
- SAF-2) The GPM shall accurately calculate user fees.
- SAF-3) The GPM shall not accidentally lose auction information.

5.18 Scalability

This subsection specifies the following requirements associated with the degree to which the system can scale (e.g., can handle more simultaneous users or clients, can store more information in its databases).

- SCA-1) The GPM shall be able to scale as follows:

Release	Open Sales	Sales Per Year	Total Employees	Total Users	Simultaneous Interactions
0	10	N/A	10	10	10
1	10,000	50,000	50	500,000	10,000
2	25,000	250,000	250	5,000,000	50,000
3	100,000	1,000,000	500	10,000,000	250,000

5.19 Security Requirements

This subsection documents the security requirements that specify the extent to which the GPM shall protect itself and its sensitive data and communications from accidental, malicious, or unauthorized access, use, modification, destruction, or disclosure.

5.19.1   Identification Requirements

This subsection documents the identification requirements that specify the extent to which the GPM shall identify its externals (e.g., human users and external applications) before interacting with them:

- **Accountant** – A minimum of 99.999% of the time, the GPM shall identify the accountant before permitting him or her to perform the following accountant use cases:
    - Accountant Generates Financial Reports
    - Accountant Updates the Fee Schedule
    - Accountant Updates User Restrictions

- **Buyer** – A minimum of 99.99% of the time, the GPM shall identify the buyer before permitting him or her to perform the following buyer use cases:
    - Buyer Reviews Personal History
    - Buyer Registers Feedback About Seller
    - Buyer Registers for Notification of Future Sales
    - Buyer Places Bid On Item
    - Buyer Modifies Bid On Item
    - Buyer Buys Item At Direct Sale
    - Buyer Places Sealed Offer At Decreasing Price Sale
    - Buyer Modifies Sealed Offer

- **Security Officer** – A minimum of 99.% of the time, the GPM shall identify the security officer before permitting him or her to perform the following security officer use cases:
    - Security Officer Generates Security Reports

- **Seller** – A minimum of 99.99% of the time, the GPM shall identify the seller before permitting him or her to perform the following seller use cases:
    - Seller Registers Sale
    - Seller Modifies Sale
    - Seller Cancels Sale
    - Seller Reviews Personal Feedback History
    - Seller Reviews Personal Sales

- **User** – A minimum of 99.99% of the time, the GPM shall identify the user before permitting him or her to perform the following user use cases:
    - User Registers User Account
    - User Maintains User Account
    - User Displays Own Feedback History
    - User Obtains User Email Address
    - User Reviews Personal Account Status
    - User Inquires Regarding Personal Account

- **User Support Agent** – A minimum of 99.999% of the time, the GPM shall identify the user support agent before permitting him or her to perform the following user use cases:
    - User Support Agent Handles User Inquiry
    - User Support Agent Sanctions User

5.19.2 Authentication Requirements

This subsection documents the authentication requirements that specify the extent to which the GPM shall verify the identity of its externals (e.g., human users and external applications) before interacting with them:

- **Accountant** – A minimum of 99.999% of the time, the GPM shall verify the identity of the accountant before permitting him or her to perform the following accountant use cases:
    − Accountant Generates Financial Reports
    − Accountant Updates the Fee Schedule
    − Accountant Updates User Restrictions
- **Buyer** – A minimum of 99.999% of the time, the GPM shall verify the identity of the buyer before permitting him or her to perform the following buyer use cases:
    − Buyer Reviews Personal History
    − Buyer Registers Feedback About Seller
    − Buyer Registers for Notification of Future Sales
    − Buyer Places Bid On Item
    − Buyer Modifies Bid On Item
    − Buyer Buys Item At Direct Sale
    − Buyer Places Sealed Offer At Decreasing Price Sale
    − Buyer Modifies Sealed Offer
- **Security Officer** – A minimum of 99.999% of the time, the GPM shall verify the identity of the security officer before permitting him or her to perform the following security officer use cases:
    − Security Officer Generates Security Reports
- **Seller** – A minimum of 99.999% of the time, the GPM shall verify the identity of the seller before permitting him or her to perform the following seller use cases:
    − Seller Registers Sale
    − Seller Modifies Sale
    − Seller Cancels Sale
    − Seller Reviews Personal Feedback History
    − Seller Reviews Personal Sales
- **User** – A minimum of 99.99% of the time, the GPM shall verify the identity of the user before permitting him or her to perform the following user use cases:
    − User Registers User Account
    − User Maintains User Account
    − User Displays Own Feedback History
    − User Obtains User Email Address
    − User Reviews Personal Account Status
    − User Inquires Regarding Personal Account
- **User Support Agent** – A minimum of 99.999% of the time, the GPM shall verify the identity of the user support agent before permitting him or her to perform the following user use cases:
    − User Support Agent Handles User Inquiry
    − User Support Agent Sanctions User

5.19.3 Authorization Requirements

This subsection documents the authorization requirements that specify the access and usage privileges of authenticated users and client applications:

- **Accountant** – A minimum of 99.999% of the time, the GPM shall restrict the performance of all accountant use cases to persons who a security officer has currently designated as accountants.

- **Buyer** – A minimum of 99.99% of the time, the GPM shall restrict the performance of the following buyer use cases to persons who have successfully registered as a user, who are not currently suspended, and who are not permanently banned:
  - Buyer Reviews Personal History
  - Buyer Registers for Notification of Future Sales
  - Buyer Places Bid On Item
  - Buyer Modifies Bid On Item
  - Buyer Buys Item At Direct Sale
  - Buyer Places Sealed Offer At Decreasing Price Sale
  - Buyer Modifies Sealed Offer

- **Buyer** – A minimum of 99.99% of the time, the GPM shall restrict the performance of the following buyer use cases to persons who have successfully registered as a user, who are not currently suspended, who are not permanently banned, and who have successfully bought from the seller:
  - Buyer Registers Feedback About Seller

- **Security Officer** – A minimum of 99.999% of the time, the GPM shall restrict the performance of all security officer use cases to persons who a different security officer has currently designated as a security officer.

- **Seller** – A minimum of 99.99% of the time, the GPM shall restrict the performance of the following seller use cases to persons who have successfully registered as a user, who are not currently suspended, and who are not permanently banned:
  - Seller Registers Sale
  - Seller Modifies Sale
  - Seller Cancels Sale
  - Seller Reviews Personal Feedback History
  - Seller Reviews Personal Sales

- **User** – A minimum of 99.99% of the time, the GPM shall verify the identity of the user before permitting him or her to perform the following user use cases:
  - User Registers User Account
  - User Maintains User Account
  - User Displays Own Feedback History
  - User Obtains User Email Address
  - User Reviews Personal Account Status
  - User Inquires Regarding Personal Account

- **User Support Agent** – A minimum of 99.999% of the time, the GPM shall restrict the performance of all user support use cases to persons who a security officer has currently designated as a user support agent.

5.19.4 Immunity Requirements

This subsection documents the immunity requirements that specify the extent to which the GPM shall protect itself from infection by unauthorized harmful programs (e.g., computer viruses, worms, and Trojan horses):

- **Scanning** – The GPM shall scan all entered or downloaded data and software against the published definitions of known computer viruses, worms, Trojan horses, and other similar harmful programs.

- **Disinfection** – If possible, the GPM shall disinfect any data or software found to contain such a harmful program.

- **Prevention** – The GPM shall delete the infected file if it cannot disinfect the infected data or software.
- **Current Definitions** – The GPM shall daily update its list of published definitions of known harmful programs.
- **Notification** – The GPM shall notify a member of the security team if it detects a harmful program during a scan.

5.19.5 Integrity Requirements

This subsection documents the integrity requirements that specify the extent to which the GPM shall protect its data and communications from intentional corruption via unauthorized creation, modification, or deletion:

- **Communications** – The GPM shall protect a minimum of 99.999% of its communications from unauthorized intentional corruption during transit including communications with the:
  - Employees:
    - Accountants
    - Security Officers
    - User Support Agents
  - Users:
    - Buyers
    - Sellers
  - Authorization Processing Gateway (for Credit Card Authorizations)
- **Persistent Data** – The GPM shall protect a minimum of 99.999% of its persistent data from unauthorized intentional corruption including:
  - Account Information
  - Accounting Information
  - Feedback Information
  - Transaction Information
  - Sale Information
  - Security Information
  - User Inquiry Information

5.19.6 Intrusion Detection Requirements

This subsection documents the intrusion-detection requirements that specify the extent to which the GPM shall detect attempted access or modification by unauthorized individuals or programs:

- **Repeated Authentication Failure** – A minimum of 99.99% of the time, the GPM shall notify the security officer within one minute if it cannot successfully verify the identity of any actor in less than four attempts within any one-hour period.
- **Authorization Failure** – A minimum of 99.99% of the time, the GPM shall notify the security officer within one minute if any actor attempts to perform a use case for which it is unauthorized.

5.19.7 Nonrepudiation Requirements

This subsection documents the nonrepudiation requirements that specify the extent to which the GPM shall prevent a party to one of its interactions (e.g., message, transaction) from denying having participated in all or part of the interaction:

- **Accountant:**
  - **Accountant Updates Fee Schedule** – A minimum of 99.999% of the time that an accountant updates the fee schedule, the GPM shall make and store a tamper-proof record including the following information:

- Accountant name and identifier
- Date and time
- Updated fees information (fee type, original value, and new value)

- **Accountant Updates User Restrictions** – A minimum of 99.999% of the time that an accountant updates a user restriction, the GPM shall make and store a tamper-proof record including the following information:
  - Accountant name and identifier
  - Date and time
  - Restriction information (i.e., restriction type, original value, and new value)

- **Buyer:**
  - **Buyer Registers Feedback About Seller** – A minimum of 99.999% of the time that a buyer registers feedback about a seller, the GPM shall make and store a tamper-proof record including the following information:
    - Buyer name and identifier
    - Date and time
    - Feedback information (i.e., seller, sale, sale type, sale date, feedback comments)
  - **Buyer Registers for Notification of Future Sales** – A minimum of 99.9% of the time that a buyer registers for notification of future sales, the GPM shall make and store a tamper-proof record including the following information:
    - Buyer name and identifier
    - Date and time
    - Search criteria (i.e., item categories, keywords, seller)
  - **Buyer Places Bid On Item** – A minimum of 99.999% of the time that a buyer places a bid on one or more items at an auction, the GPM shall make and store a tamper-proof record including the following information:
    - Buyer name and identifier
    - Date and time
    - Sale information (e.g., identifier, type = 'auction', status)
    - Bid information (e.g., bid amount, the bid type, the desired quantity)
  - **GPM Notifies Buyer Of Being Outbid** – A minimum of 99.9% of the time that GPM notifies a buyer about being outbid at an auction, the GPM shall make and store a tamper-proof record including the following information:
    - Buyer name and identifier
    - Date and time email sent
    - Sale information (e.g., identifier, type = 'auction', status, item name, item description, current bid amount)
    - Buyer's bid information (e.g., bid amount, quantity desired)
  - **Buyer Modifies Bid On Item** – A minimum of 99.999% of the time that a buyer modifies the buyer's existing bid on one or more items at an auction, the GPM shall make and store a tamper-proof record including the following information:
    - Buyer name and identifier
    - Date and time
    - Sale information (e.g., identifier, type = 'auction', status)
    - Original and modified bid information (e.g., bid amount, the bid type, the desired quantity)
  - **Buyer Buys Item At Direct Sale** – A minimum of 99.999% of the time that a buyer buys one or more items at a direct sale, the GPM shall make and store a tamper-proof record including the following information:

- Buyer name and identifier
- Date and time
- Sale information (e.g., identifier, type = 'direct', status)
- Purchase information (e.g., item name, item description, purchase price, quantity purchased)
- **Buyer Places Sealed Offer At Decreasing Price Sale** – A minimum of 99.999% of the time that a buyer places a sealed offer on one or more items at a decreasing price sale, the GPM shall make and store a tamper-proof record including the following information:
  - Buyer name and identifier
  - Date and time
  - Sale information (e.g., identifier, type = 'decreasing price', status)
  - Offer information (e.g., offer amount, the desired quantity)
- **Buyer Modifies Sealed Offer** – A minimum of 99.999% of the time that a buyer modifies the buyer's existing sealed offer on one or more items at a decreasing price sale, the GPM shall make and store a tamper-proof record including the following information:
  - Buyer name and identifier
  - Date and time
  - Sale information (e.g., identifier, type = 'decreasing price', status)
  - Original and modified sealed offer information (e.g., offer amount, the desired quantity)
- **Security Officer:**
  - **Security Officer Assigns Internal Role** – A minimum of 99.999% of the time that a security officer assigns an internal role, the GPM shall make and store a tamper-proof record including the following information:
    - Security officer name and identifier
    - Date and time
    - Assignment information (i.e., person's name, identifier, and role)
  - **GPM Notifies Security Officer of Security Violation** – A minimum of 99.999% of the time that the GPM notifies a security officer of a security violation, the GPM shall make and store a tamper-proof record including the following information:
    - Security officer name and identifier
    - Date and time
    - Violation information (i.e., violation type, notification form)
- **Seller:**
- **User:**
- **User Support Agent:**

5.19.8 Privacy Requirements

The privacy goal of the GPM is to ensure the confidentiality of all information entrusted to it, whether stored or communicated, except for such information that an operational requirement explicitly makes public.

The following privacy requirements specify the extent to which the GPM shall support anonymity and keep its confidential data and communications private from unauthorized individuals and programs.

- **User Privacy** – A minimum of 99.999% of the time, the GPM shall restrict access as indicated to the following confidential user information, whether communicated or stored:
  - Credit Card Information (restricted to the user, accountants, and user support agents):
    - The credit card number (employees may only see the last 4 digits)
    - The credit card expiration date
    - The name on the credit card

- Financial Information (restricted to the user, accountants, and user support agents):
  - Account Balance
  - Past Due Amount
- Password Information (restricted to the user and user support agents):
  - Password
  - Password Confirmation
- Postal Address (restricted to the user and user support agents):
  - Street Address
  - City
  - State
  - Zip Code
- Telephone Number (restricted to the user and user support agents)

5.19.9   Security Auditing Requirements

This subsection specifies the following privacy requirements:

- TBD

5.19.10 Survivability Requirements

This subsection specifies the following privacy requirements:

- TBD

5.19.11 Physical Protection Requirements

This subsection specifies the following privacy requirements:

- TBD

5.19.12 System Maintenance Security Requirements

This subsection specifies the following system-maintenance requirements:

- SEC-20) The GPM shall ensure that authorized modifications during maintenance will not inadvertently allow unauthorized individuals access to the system.

5.20 Testability

This subsection specifies the following requirements associated with the ease with which the system can be tested.

- TST-1) TBD

5.21 Usability

This subsection specifies the following requirements associated with the ease with which the system can be used.

- The application shall enable at least 90% of a statistically valid sample of representative novice users to:
  - Register as a seller within 10 minutes.
  - Register an auction within 5 minutes.
  - Place a bid on a given item within one minute.
  - Provide feedback on a seller within 3 minutes.

- The application shall enable at least 90% of a statistically valid sample of representative experienced users to:
    - Register as a seller within 5 minutes.
    - Register an auction within 2.5 minutes.
    - Place a bid on a given item within 30 seconds.
    - Provide feedback on a seller within 2 minutes.

- USE-5) The average seller shall be able to learn to register a sale within 5 minutes.

- USE-6) The average buyer shall be able to learn to find relevant items within 3 minutes.

- USE-7) The average buyer shall be able to learn to place a bid or offer within 3 minutes.

- USE-8) The typical user shall be able to freely, easily, and quickly navigate between relevant webpages.

6   System Constraints

The section documents the major architecture, design, and implementation constraints on the system.

6.1   Business Rules

The subsection documents all required data design constraints.

6.2   Data and Content Constraints

The subsection documents all required data constraints.

6.2.1   Databases

The subsection documents all required design constraints regarding the use of databases.

- None

6.3   Hardware Constraints

The subsection documents all required constraints associated with minimum or actual hardware.

- None

6.4   Software Constraints

The subsection documents all required software constraints.

6.4.1   High-Level Languages

The subsection documents all required design constraints associated with the use of high-level programming languages.

- SYSDC-HLL-1) Application server software shall be written in Java.
- SYSDC-HLL-2) Employee client software shall be written in Java.
- SYSDC-HLL-3) User client software shall be written in DHTML, CSS, and JavaScript webpages.
- SYSDC-HLL-4) Where practical, data shall be defined and documented using XML.

6.5   Industry Standards

The subsection documents all required design constraints associated with industry standards.

DC-STD-1) The system shall conform to ISO 10646 (Unicode UTF-8) and ISO 10646-1 (Unicode UTF-16) standards for character set encoding.

- www.unicode.org
- ftp.informatik.uni-erlangen.de/pub/doc/ISO/charsets/ISO-10646-UTF-8.html
- ftp.informatik.uni-erlangen.de/pub/doc/ISO/charsets/ISO-10646-UTF-16.html

DC-STD-2) The system shall conform to ISO 4217, codes for the representation of currencies.

- www.xe.net/gen/iso4217.htm

DC-STD-3) The system shall conform to ISO 31, codes for units of measure.

- www.unece.org/trade/rec/rec20en.htm

DC-STD-4) The system shall conform to ISO639-1 Languages, codes for the representation of languages.

- http://sunsite.berkeley.edu/amher/iso_639.html

DC-STD-5) The system shall conform to ISO 3166-1, codes for the representation of names of countries.

- www.din.de/gremien/nas/nabd/iso3166ma/codlstp1/index.html

DC-STD-6) The system shall conform to ISO 8601, representation of dates and times.

- www.state.ak.us/local/akpages/ADMIN/info/iso8601.htm

6.6 Legal and Regulatory Constraints

The subsection documents all required design constraints associated with legal and regulatory constraints.

- None

Appendices

This section documents the following appendices:

- Envisioned Future Enhancements
- Open Issues
- Major TBDs
- Assumptions

A. Envisioned Future Enhancements

TBD

B. Open Issues

This appendix documents the following open issues to be resolved:

- How long should user accounts be stored as deleted after being deleted by the user?
- Should the GPM force users to update their passwords on a regular basis? If so, how often.
- Should there be buyer fees (e.g., for insurance and escrow services)?
- Should escrow include seller's items in addition to winning buyers payment?
- Should sellers be allowed to update their auction including lowering the minimum bid, lowering the reserve price, increasing the quantity, and adding a picture? If so, when?
- In how many ways can the results of searches be sorted?
- Can a buyer use their credit card to pay for electronic money from GPM, which pays the seller?
- Can auctions that do not have winners be automatically relisted?
- Are keywords input by sellers, or are they input by buyers and run against the item title and description?
- Should we allow first buyer discounts to spur on bidding?
- Should the start of auctions be delayed briefly to allow time to change/cancel the auction?
- If the instant win price = the minimum bid, then it is a fixed price sale rather than an auction.
- Should there be a limit on the dollar amount and number of transactions in a time period for a user?
- Should FAQs be on a general information page basis rather than their own page?

C. Major TBDs

This appendix documents the following major TBDs:

- Add direct sales including fixed-price and decreasing price:
  - Buyer
  - Seller
  - Accountant fees
- Remove unnecessary GUI information.
  - Buyer
- Do not allow seller to select winning buyer.
- Add instant win price.
- Require the reading of the user agreement as part of registration.
- Add correctness requirements.
- Requirements for Release 4:

- Escrow
- Insurance
- Auction of services
- Do consistency check in preparation for inspection:
    - Consistency with SRS content and format standard
    - Internal consistency:
        - Do similar use case paths have similar structures?
    - Consistency with PG
- Hold inspection
- Iterate based on inspection results
- Publish

D. Assumptions

TBD