TEAM BEANS

Vision Document

Wenzheng Kang

Michael Plante

Sabbir Ahmed

Trevor Swann

Ian Wittler

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1 Introduction

1.1 Purpose

The purpose of this document is to define the high-level needs and features of the GreenBox Audiobook Lending System (GBALS). It identifies the business opportunities present with this system, as well as stakeholders and end-users of the product, and describes the functionality required for each respective group. Constraints on the development of the product will also be discussed. The document is primarily intended to align the expectations of all stakeholders with those of the development team regarding the eventual product.

1.2 Scope

The scope of this document is limited to the GreenBox Audiobook Lending System that is to be designed by Team Beans in Summer 2022 as part of the Object-Oriented Analysis and Design course at Johns Hopkins University.

1.3 Definitions, Acronyms, and Abbreviations

Term	Definition
GBALS	GreenBox Audiobook Lending System
GUI	Graphical User Interface
API	Application Programming Interface
SSL	Secure Sockets Layer

Table 1.3 Terminology with Definition

2 Positioning

2.1 Business Opportunity

The GreenBox Audiobook Lending System has the potential to bring new innovative technology to a public library system. The Lending System will serve to be useful for library systems that cannot currently manage audiobooks around the clock without any human interaction needed during transactions. This system will allow customers to reserve audiobooks at kiosk locations and subsequently receive a pick-up time slot dependent upon the audiobooks' availability. This system reduces the need for mundane tasks by library employees (i.e., recording and handing audiobooks to every customer). Additionally, it allows customers to pick up audiobooks at their convenience with the system operating outside of normal operating business hours. While this system does handle customer verification, an audiobook user interface, and fines, it is assumed that those functionalities are already implemented by the associated public library. If that is not the case, then that would also be an additional benefit.

2.2 Problem Statement

The problem of inefficient audiobook lending practices affects customers and library employees. For library employees, the impact of the problem is wasted time personally handling each audiobook that is checked out of the library, which could be better utilized in handling other more important tasks. For customers, the impact of the problem is longer lines waiting for library employees to check out their selected audiobooks. Additionally, customers are limited to only checking out audiobooks during library hours, which is not ideal for busy customers who have limited time to run to the library.

A successful solution would include:

- 24/7 operating audiobook kiosk which allows customers to pick up and drop off audiobooks.

- A system that manages the availability of audiobooks in a kiosk.

- A system that can add/drop audiobooks by library employees.

- A GBALS website for searching/reserving the kiosk.

2.3 Product Position Statement

For library customers, who need a fast and convenient way to check out audiobooks. The Greenbook Lending Audiobook System is a self-checkout kiosk that is available to search, reserve, and pick up audiobooks 24/7. Unlike other audiobook lending systems, our product requires very minimal wait time from check-out to pick-up and no need for library employee interaction.

3 Stakeholder and User Descriptions

3.1 Market Demographics

Most libraries have limited to no support for audiobook services. Many customers who had previously borrowed books from libraries have opted to borrow audiobook versions of their physical counterparts for their convenience. Many customers are unable to carry and read their favorite books when performing tasks such as operating a vehicle, exercising, or any other activities that demand available hands. The newer and younger customers also tend to follow the trend and prefer audiobooks. GBALS is crucial for users who prefer to enjoy books in their audio format.

3.2 Stakeholder Summary

Name	Represents	Role
Investors	The Library System	The public library system took the initiative to implement GBALS into each of its branches
Employees	Library employees	The librarians need to be able to provide customer service to customers by checking inventory and making manual withdrawals.
	Library system administrators	The system administrators need to be able to troubleshoot any issues with the kiosks and help the library staff
Customers	Library customers	The customers need to be able to utilize the kiosks to search, reserve, and borrow the audiobooks available at a branch

Table 3.2 Stakeholder Summary of GBALS

3.3 User Summary

Name	Description	Stakeholder
Library staff	The librarians need to be able to inspect the inventory of the kiosks at their branches and rebalance their distributions.	Employees
Library system administrator	The system administrators need to be able to use the special administrator web interface to generate reports and manage inventory	Employees
Library customers	The customers are the key users for the GBALS and comprise the largest user group	Customers

Table 3.3 User Summary of GBALS

3.4 User Environment

The users of the GBALS are the library staff and system administrators and the customers visiting the library branches. The library staff members are expected to be technically literate to utilize their special cards to authenticate and access the GBALS kiosks. They may use the kiosks to inspect the local inventory and provide customer service when requested. The system administrators must have access to the special administrator web interface to perform troubleshooting, updating, and upgrading of the systems.

The largest expected group of users are the Library customers. They may access the GBALS via the kiosks on-site or the public web interface. The web interface requires the customer to have an internet connection. The customer must also have an account with the Library to utilize the features provided by GBALS.

3.5   Stakeholder Profiles

3.5.1 The Library System

Representative	Investors
Description	The Public Library System
Type	The public library system implementing GBALS into its branches
Responsibilities	The Library is the sole investor in the addition of the GBALS web interface and the kiosks in its branches
Success criteria	Completion of the pilot program to install the GBALS in the system
Involvement	The Library generates and reviews the requirements
Deliverables	None
Comments or issues	None

Table 3.5.1 The Profile of the Library System

3.5.2 The Library Employees

Representative	Employees
Description	Employees
Type	The employees working on-site at the Library branches
Responsibilities	Inspect and manage inventory via the kiosks using special cards for authentication
Success criteria	Ability to complete the responsibilities listed
Involvement	Provide regular feedback on the status and needs of GBALS
Deliverables	None
Comments or issues	None

Table 3.5.2 The Profile of the Library Employees

3.5.3 The Library System Administrators

Representative	Employees
Representative	Employees
Description	System administrators
Type	The system administrators with sufficient technical background to generate various reports and manage inventory
Responsibilities	Troubleshoot, update, and upgrade the kiosks using a special system administration web interface
Success criteria	Ability to complete the responsibilities listed

Involvement	Provide regular feedback on the status and needs of GBALS
Deliverables	None

Table 3.5.3 The Profile of the Library System Administrators

3.5.4 Customers

Representative	Employees
Representative	Customers
Description	Customers
Type	The customers at the library are interested in gaining access to audiobooks
Responsibilities	Search, reserve, and borrow the audiobooks available at the local branch
Success criteria	Ability to complete the responsibilities listed
Involvement	Provide regular feedback on the status and needs of GBALS
Deliverables	None

Table 3.5.4 The Profile of the Customers

3.6   User Profiles

3.6.1 The Library Staff

Representative	Employees
Representative	Employees
Description	Employees
Type	The staff employed by the Library with prior experience in tasks similar to the features provided by the kiosks
Responsibilities	Inspect and manage inventory via the kiosks using special cards for authentication
Success criteria	Ability to complete the responsibilities listed
Involvement	Testing the kiosks' abilities to retain inventory after stress testing before their release
Deliverables	None

Table 3.6.1 The User Profile of the Library Staff

3.6.2 The Library System Administrators

Representative	Employees
Representative	Employees
Description	System administrators

Type	The system administrators with sufficient technical background to generate various reports and manage inventory
Responsibilities	Troubleshoot, update, and upgrade the kiosks using a special system administration web interface
Success criteria	Ability to complete the responsibilities listed
Involvement	Thoroughly testing the limits of the kiosks before their release
Deliverables	None

Table 3.6.2 The User Profile of the Library System Administrators

3.6.3 Customers

Representative	Employees
Representative	Customers
Description	Customers
Type	Casual users with access to numerous but high-level features
Responsibilities	Search, reserve, and borrow the audiobooks available at the local branch
Success criteria	Ability to complete the responsibilities listed
Involvement	Provide feedback on user-experience
Deliverables	None

Table 3.6.3 The User Profile of the Customers

3.7 Key Stakeholder Goals/Needs

The key prompt perceived by the stakeholder or user is the lack of an audiobook lending system available for a public library system. All other goals and needs are derived from this prompt. The key stakeholder goals and needs are listed as follows.

Need	Priority	Concerns	Current solution	Proposed solution
System Realization	High	Failed pilot project	N/A	GBALS development.
System Safety	Critical	Safety vulnerabilities including data leaks and malicious attack	Customer Information is stored in the main library system.	Integration with safety-critical database systems.
System Maintenance	High	Inefficient, insufficient maintenance	N/A	Provide corrective, adaptive, and perfective maintenance.
Market Availability	Moderate	Low customer satisfaction and accessibility	N/A	Physical marketing printings, social media marketing, etc.

Commercial Viability	High	Low competence/profitability	N/A	Set a low-profit goal; Expect low profit during the first several months.

<p align="center">Table 3.7 Stakeholder Goals and Needs</p>

3.8 User Goals/Needs

The ultimate goal of the users is successful usage and smooth experience with the newly developed audiobook lending system. Therefore, the key question to arise for the users of the system would be: what characteristics of the system can contribute to their goal? The users' goals and needs are listed as follows.

Need	Priority	Concerns	Current solution	Proposed solution
User-Friendly GUI	High	Complicated GUI	N/A	Follow the same GUI strategy as the main library website.
Safe User's Environment	Critical	The user's account is not secure	Library Staff Security;	A lending account is secured with a credit card.
User Involvement	Moderate	Low involvement/ insufficient feedback	N/A	Open the CONTACT-US tab; the Customer Feedback survey is available at kiosks.
Easy-to-use Application	High	Long learning time	N/A	Follow the same dynamic design strategy as the main library website.

<p align="center">Table 3.8 User Goals and Needs</p>

4 Product Overviews

The GreenBox Audiobook Lending System features audiobook search, reservation, request to wait, and return of audiobooks. It is available 24/7/365 and will be periodically maintained. In this section, a high-level view of the capabilities of the audiobook lending system, interfaces to external applications, and system configurations will be discussed

4.1 Product Perspective

The audiobook lending project is developed to be a component of a complex public library system that consists of relevant systems and interfaces. According to the description, the GBALS website will become part of the library website. The audiobook lending system needs to work with the existing external systems such as the following.

- **Session management system.**

  A user's library website account session must be alive to use the GBALS. A session-checking algorithm stands outside the scope of the GBALS. It will be taken care of by the session management system of the library website.

- **User Authentication system.**

  A user must be authenticated to assess the kiosk. The authentication process is external to GBALS, but it is performed by the user authentication system by the library.

- **Library accounting system.**

  A user's account must be in good standing without an outstanding fine balance to be able to borrow an audiobook. The fine calculation will be taken care of by the library accounting system which is out of control by GBALS.

- **Account status management system.**

  The status of the user's account will be monitored by the existing library system which is out of the scope of GBALS.

- **Audiobook inventory and re-distribution system.**

  Even though stocking and emptying kiosks will be taken care of by the GBALS, inventory management and re-distribution will be at the library system level.

- **Customer Information Database**

  The main library system is responsible for storing all the customer information, while GBALS will retrieve customer information as needed.

The main user's environment will be the GBALS website. All users will need to have access to the internet to be able to use the website. Customers access the website to search for an audiobook and reserve it. System administrators can assess the website to perform administrative tasks using a special administrator web interface.

Another user's environment will be the kiosk location. Authenticated customers can pick up and return audiobooks at specific kiosk locations. Authenticated library employees can enter kiosks to perform listing and loading tasks.

4.2 Summary of Capabilities

As stated in the General Description of the problem, this project is a pilot project to be developed as a part of the library website. The key question to arise for the stakeholders and users of this system would be: what benefits would they care about the most?

Stakeholder/User benefit	Supporting features
Audiobooks can be reserved and picked up at kiosk locations. The whole process is done online.	Customers can access the GBALS website to set up a lending account and begin to borrow audiobooks.
Customers can quickly learn how to use GBALS.	An obvious and easy-to-find navigation tool will be provided to guide the customers from the main library website to the GBALS website.

Customers can use the same library account to access the audiobook lending account.	With a shared customer information database, the system allows customers to use the registered library card to set up a lending account.
Smooth and uninterrupted customer experience with the system.	Customers can place reservations online and pick them up at kiosks open for 324/4/365.
Customers can still borrow an audiobook which will become available in the future.	Request for a title can be placed online to join the queue waiting for available audiobooks.
Customers can cancel a reservation or request.	The system allows up to two days for customers to cancel.
Library employees can manage books at the kiosk locations.	The system distinguishes users from the kiosks—customers or library employees. If a library employee is present, the contents of the kiosk can be changed and fixed.
Library administrators can request reports of kiosk operations, status, and contents.	The system provides a special administrator web interface that can generate reports which enable a high-level review of system status.

Table 4.2 The Summary of Capabilities of GBALS

4.3 Assumptions and Dependencies

- Assumption 1: External systems listed in section 4.1 will have available APIs for the development of the GBALS.

- Assumption 2: Users of the website will have access to the internet.

- Assumption 3: Users hold credit cards to set up a lending account.

- Assumption 4: Hardware and construction at the kiosk will be external to the design of the GBALS

- Assumption 5: The main library website is well maintained and accessible.

- Assumption 6: Normal operation at the main library will not be affected during the development of the GBALS.

4.4 Licensing and Installation

To keep user data secure, verify ownership of the website, prevent attackers from creating a fake version of the site, and gain user trust, the GBALS website needs to obtain an SSL certificate on the web server. Free SSL web server providers such as Greenock-Express may be installed.

5 Product Features

5.1 Search

- Allow customers to find the titles they are looking for among the library inventory while on the website.

5.2 Reservation

- Allow customers to reserve titles for kiosk pickup for three days while on the website.
- Allow users to cancel unnecessary reservations early.

5.3 Request

- Allow customers to join a queue for reserving titles that are unavailable at a kiosk while on the website.
- Automatically create a reservation (see 5.2) and notify the customer when the title becomes available at the kiosk.
- Allow customers to remove themselves from the queue.

5.4 Borrow

- Allow customers to pick up reserved books from the kiosk.

5.5 Return

- Allow customers to return borrowed books to a kiosk.
- If returned late (after two weeks), issue a fine via the library accounting system.

5.6 Manage Kiosk Inventory

- Allow library employees to check kiosk contents.
- Allow library employees to add books to a kiosk.
- Allow library employees to remove books from a kiosk.

5.7 Generate Reports

- Allow administrators to retrieve system data via the web.

5.8 Manage System Inventory

- Allow administrators to check kiosk contents and book status via the web.
- Allow administrators to add titles to the system.
- Allow administrators to add or remove copies of books from the overall system inventory.

6   Constraints

6.1   Design Constraints

- The extent of knowledge and experience designing software

- Knowledge of Objected Oriented Design

6.2   Operational Constraints

- Team member availability

- Strength of remote collaboration

7   Reference

[1]   "Vision Document." Vision Document for a Requirements Project,
https://www.ibm.com/docs/en/elm/7.0.0?topic=requirements-vision-document.