

BookQ

BookQ Inc., Team 9

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Software Requirements Specification Document

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1 Purpose

Background: According to Pew Research, over 75% of Americans read or attempt to read a book each year. While this makes for a significant market for book sales, a sizable portion of this market is commanded by Amazon, a company founded in 1996 to obtain rare books online that has gradually implemented almost all other categories of physical goods into its inventory, as well as the service of server space rental. In addition, Amazon sells Kindles and tablet computers that store and display books. A major driver of book sales for Amazon is its subsidiary Goodreads, a company founded in 2006 and acquired by Amazon in 2013. Goodreads allows users to search a database of books, view annotations made by Kindle users in their books, read and write reviews for books, and create quizzes, polls, and discussions about books. Using this information, Amazon makes suggestions to users about which books they might want to read. A competitor, The Story Graph, also allows users to catalog and rate books, and makes suggestions based on this information. Unlike Goodreads, which is entirely free, The Story Graph has a subscription model to view detailed statistics and make customized graphs and collections.

Needs: A competitor to the extant products in this market must address the criticisms levied against those products and provide additional functionality and value for the customer. Criticisms of Goodreads under the ownership of Amazon include objections to monopolistic inclination of the parent company, that the rating system is easy to manipulate by bad actors, that the suggestion algorithm is fairly primitive, and a lack of transparency with respect to the process by which books are promoted or demoted in prominence. Criticisms of The Story Graph tend to center around the fact that it has fewer social features than Goodreads and does not natively integrate with Facebook and X for sharing books and reviews. Other needs not addressed by these other applications include offline functionality (for users who are away from Internet access), locating books from sources other than Amazon, and concerns over the privacy of the information being fed into the computer. It would also be prudent to address the need for coverage for titles that are not easily searchable: custom entries are necessary to make sure that every book is cataloged, including rare books and ones that have gone out of print. There is also a need in the market for a product whose funding source lacks the ulterior motive of Amazon without resorting to the freemium subscription model of The Story Graph; the business of the latter is more akin to a charity donation or a patronage than a justifiable purchase.

2 Scope

This application serves to bring innovation to literature discovery. Users are indirectly asked what kinds of books align with their interests through personality quizzes. From these quizzes' answers, literature that shares the same qualities as the user will be recommended. By using questions not particularly related to reading, users who are not avid readers, and thus do not know their reading interests at first, will be able to find a genre of books they will enjoy.

In addition to this overall functionality, BookQ will also include the following features. First, BookQ must provide the user with their library without Internet access. This means that book entry, notation, and cataloging, as well as retrieval of this information, should be locally stored for each user to allow this

application to operate even when away from reception or Internet access. As this information will be easily compressed text, this should not require an inordinate amount of storage space. Second, this product should, when connectivity is available, provide users with recommendations of books that align with attributes derived from their quiz scores, and periodically provide new personality quizzes to obtain more data about the user's interests. To this end, there should be integration with the catalogs of nearby libraries in addition to retailers. Third, this application should encourage authors of all calibers by making suggestions of popular and more obscure literature. Finally, this application should serve to uplift local bookstore owners through partnership: a source of additional income from this app beyond its purchase price could be commission from referrals.

3 User characteristics

3.1 Primary users

This product targets a diverse group of book enthusiasts. These readers, with their individual needs, will be considered the primary user group for BookQ:

General Readers: Education & Experience: Basic to intermediate literacy and familiar with digital reading platforms. On average, expect a journeyman level of familiarity with the subject area.

Technical Expertise: Moderate; prefer easy-to-use interfaces. Again, a journeyman level of expertise with the subject area.

Avid Readers & Collectors: Education & Experience: Often highly educated with extensive reading habits and familiarity with book tracking apps. Readers in this category are masters in this domain and will want suggestions that they would not otherwise consider.

Technical Expertise: Comfortable with advanced features but value usability. Avid readers are more likely to have a mastery of related technology and will appreciate additional functionality and information.

Privacy-Conscious Users: Education & Experience: Educated and wary of data privacy issues; prefer platforms that prioritize user privacy. Users who have the initiative to seek out a more secure alternative likely have a mastery of the subject matter.

Technical Expertise: Basic understanding of data security; value control over personal information. While their comprehension of underlying security will likely be on average at journeyman level, they will appreciate transparency in how their data is used and processed.

Social Readers: Education & Experience: Engage in social reading activities and appreciate features that allow sharing and community interaction. Their knowledge of literature is likely between novice and journeyman, but they are likely at least journeyman users of social applications.

Technical Expertise: Proficient with social media and seek integration with existing networks. On average, social readers are expected to have journeyman technical expertise.

Users with Accessibility Needs: Education & Experience: Varying educational levels with disabilities affecting digital interaction.

Technical Expertise: Rely on accessible design and assistive technologies.

Language learners:

Education & Experience: While possibly highly literate in a different language, this user group has a novice level of subject matter expertise in English. Therefore, lexical complexity will be of significant interest to them.

Technical Expertise: On average, someone who has the initiative to learn a new language will be expected to have at least journeyman technical expertise.

Linguistic skills: A new learner of a new language is expected to have at least a journeyman level of linguistic skill in their native language and a novice level of linguistic skill in their learned language. It may be of significant interest to such a person to read an English translation of a favorite book originally written in their native language to illustrate differences in figurative language.

The platform must offer a user-friendly experience that balances simplicity, advanced functionality, privacy, and accessibility to meet the diverse needs of these user groups

3.2 Secondary users

This product cannot function without other parts of the distribution ecosystem, including retailers, advertising affiliates, and people who have a tangential interaction with the application and recommend it to friends who are more inclined toward literature:

1. Retailers:

Education & Experience: The liaison between our businesses will be highly familiar with literature and have an exceptionally elevated level of literacy. This person is likely to have a degree in literature, computer science, business, or a combination of those diplomas. As the party are tasked with communicating with distributors, they are familiar with the market, but perhaps less so with software (a liaison from an online retailer will be more likely to be proficient with software). Overall, their subject matter experience should be master.

Technical Expertise and Attitude: Depending on the size of the bookstore company, the liaison may have significant technical knowledge and wish to conduct business through an API or wish to conduct business through email or another more personal method. Accommodating both types of order schema will maximize the number of retail partnerships we can make and therefore maximize our sale potential. Overall, their experience with technology related to the application should be journeyman to master. As some bookstore owners may have negative preconceptions toward online retailers, it is important that this application interface with retailers on their own terms.

2. Advertising affiliates:

Education & Experience: Advertising affiliates will come from a wide variety of educational backgrounds, but it should be expected that they have an expert level of proficiency in marketing and researching the subject matter they are pitching. In the

likely partners will also be familiar with at least one genre of literature. Overall, advertising partners should have a master level proficiency in the subject matter.

Technical Expertise and Attitude: While the level of technical expertise of advertising affiliates may not be extraordinarily high, they should already be well-versed in the technical requirements necessary to fulfill their role: operating social media applications, using hyperlinks, and understanding their role in directing customers to our application. In this area, although not generally, their technical expertise will be mastery. As avid users of social media applications, they should require no greater accommodation or assistance in using our application than any of our primary classes of user, and they are very likely to have a positive attitude toward technology.

3. Friends of Readers:

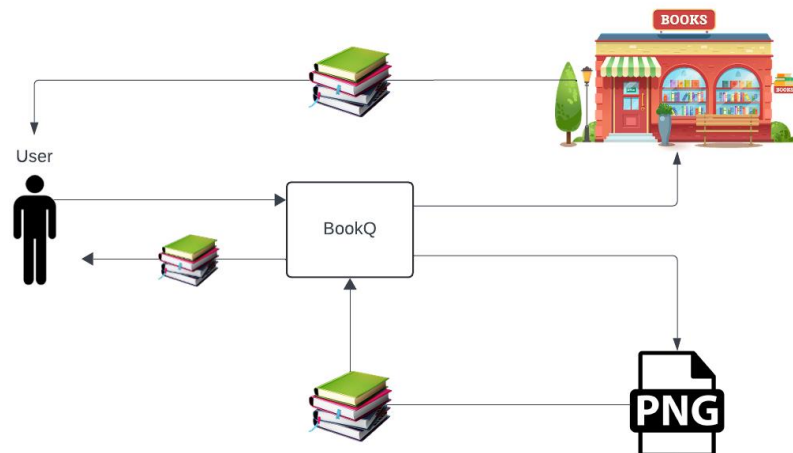
Education & Experience: It is difficult to generalize the education and experience of people who have friends or acquaintances who read but do not enjoy reading themselves, as even people with a high level of literacy may choose to forgo reading for pleasure. In the interest of access, the baseline assumption will be that their education and experience are minimal, that of a novice. This application should communicate its purpose quickly and without unnecessary complication.

Technical Expertise & Attitude: The relevant technical expertise of people who refer this app to others is presumed to be at least intermediate, as they will be likely using a computer when they encounter the application. If they lack interest in the application's aspiration, the ability to communicate its location (likely by hyperlink) is all that is necessary to serve their role in its dissemination. On balance, their presumed technical sophistication is novice, but a novice computer user is still able to share a hyperlink.

4 Product perspective

This **Product Perspective** section provides an overview of how **BookQ** fits within the larger ecosystem of software solutions, detailing its relationships with external systems and its intended use within the target market.

4.1 System Context



4.2 User interfaces

- 1) It is required that the system displays a "log in or new user" screen, and if "new user" is chosen, the user's first quiz instantly populates the screen.
- 2) The system must either display the book titles with images or without images as a concise list.
- 3) It is required that the system has at least a 720p screen.
- 4) It is required that the application has a fixed header bar which contains the navigation of the site to ensure that the user can always navigate to where they would like to go at any time.

4.3 Software interfaces

- 1) The system shall integrate with retailer APIs to fetch book availability and referral links.
- 2) The system shall interface with a relational database to manage user data, book listings, and retailer information.
- 3) The system shall provide a user-friendly search interface that allows users to filter their books by title, author, category, and year of publication.
- 4) The user should be able to enter and exit quizzes at any point while using the site.
- 5) The system should have a dashboard which is displayed upon logging in where the user can see their most recently viewed book.
- 6) The system shall let users save a list of books they intend to read.

4.4 Deployment requirements

1. Prior to this software installation, the user needs to have access to either the Google Play Store or the Apple App Store as these are where the software can be downloaded from. If none is available, Prior to installing this software the user needs to be able to use a Laptop or PC where there is internet access.

5 Assumptions and Dependencies

Dependencies

- 1) This software is dependent on multiple MySQL databases.
- 2) Dependent on access to a smart device such as Pc, Laptop, Phone or Tablet.

Assumptions

- 1) BookQ assumes that the user has a reliable internet connection or mobile data reception.
- 2) It also assumes that the user's browser is compatible with the html headers used in BookQ's software.
- 3) The user is using a device with screen dimensions of at least 1280x720 pixels.
- 4) It is assumed that the user has adequate local storage space to store downloaded book PDFs.

Update this section if dependencies are found

6 Specific requirements

R1. The system shall present to the user a quiz of variable length (the first question asked to the user shall be "how detailed of a quiz would you like to take?") consisting of either 5 or 10 questions, not including the question asking about quiz length.

R1.1 The quiz presented to the user shall ask multiple choice questions to determine which books held in the system's database have the shortest distance from user entry. Distance in the context of this system shall be defined as the magnitude of $\sqrt{w_1(x_1 - u_1)^2 + w_2(x_2 - u_2)^2 \dots + w_n(x_n - u_n)^2}$ where x is a value of a

book in the database, u is a value collected from the user based on the user's response to a question, and w is the weight the user assigned to that value.

R2 Values in the database shall be assigned based on attributes of the books (lexical level, genre, length, cost, age). Genre shall be a binary value: either the user input matches genre (4) , or it does not (0). All other factors will be assigned a value from 0 to 4.

R2.1 User will be asked for each question how important each database factor is to them, and this number (0 for "does not care at all", 1 for "care a little", 2 for "care a lot") shall be the value of w for that factor.

R3: The software should have space to store titles, years of publication, author names, and pricing so this information can be referred to continuously for accuracy.

R4. The software should have the capability to provide a PDF of a desired book for download.

R5. The system shall have functions to compare between prices of different booksellers to find the lowest price.

6.1 System Functional Requirements

- 1) As a returning user, I would like the application to store selections from my previous session so I can resume perusing from where I left off.
- 2) As a user who is interested in a book, I would like the application to forward me to a store that has this book to purchase, so that I don't have to go find the book myself.
- 3) As a user who has downloaded a book's pdf, I would like the file to be stored locally, so that I can read these titles without an internet connection.
- 4) As a new user to the site, I would like the ability to skip the personality quiz to come back to later so that I can explore the rest of the site immediately.
- 5) As an existing user, I want to see my dashboard when logging in, which shows my saved books, books which have been recommended to me based on my preferences, and books that I saved as possible future-reads to gather my books in one place.
- 6) As a user, I want to be able to like or dislike a book to make my recommendations as accurate as possible for a tailored experience.

6.2 Logical Database Requirements

- 1) The system shall use a relational database to store all book-related data.
- 2) The database shall include fields for book name, publication year, title, author, and categories.
- 3) The system shall utilize a MySQL database for efficient data storage and querying.
- 4) The database info to be stored must have appropriate data types and parameters that can be read by all the implemented functions.
- 5) The system should be able to go through and logically sort the best books for the user based on prices.

6.3 Software System Attributes

- 1) As a new user to the site, I would like the personality quiz to be conducted quickly (less than five minutes) so that I can explore the rest of the site quicker.
- 2) BookQ must be capable of handling at least 100 concurrent users without any degradation in performance or user experience.

6.3.1 Usability

- 1) For each quiz taken, the user should select at least one book that they save or purchase through an outside vendor.
- 2) Users must be able to successfully find a desired book using the search function with at least 90% accuracy on their first attempt, measured by correct search results within the top 5 listings.
- 3) Users must be able to navigate from the homepage to a specific book's page in no more than 3 clicks, ensuring a streamlined user experience.
- 4) New users should be able to complete their quiz and select a desired book within 10 minutes, with 95% of users reporting a positive experience during onboarding.
- 5) User recommendations shall always be based on the input provided, with no random suggestions at all.

6.3.2 Performance

- 1) The average time to complete a personality quiz must be less than 2 minutes if the user is instantly submitting questions.
- 2) The average time to view a book from application launch must be less than 8 seconds.
- 3) The average download time for a book must be less than 2 seconds per 100 pages.
- 4) A user should be able to set a limit for themselves as to how many books to read at once, which will be stored as a static value, possibly in an array.
- 5) The users should be able to set a budget for themselves.
- 6) Users should be able to save as many books as they want for later, which can be stored in a vector with no numerical limit.

6.3.3 Reliability/Dependability

- 1) Given that the system goes down, and the database is lost, a backup database will be loaded within 10 minutes to ensure that the site is not down for too long.
- 2) The database of the application is to be cached to backup databases every 10 minutes, saving the history of the last 3 databases.

6.3.4 Security

- 1) The system shall use HTTPS for all data exchanges to ensure secure communication.

- 2) The system shall let users delete their accounts, ensuring all their data is completely deleted.
- 3) Code management and access should only be allowed to be accessed by the administration of BookQ so that no bad actors have access to the backend data of the application.
- 4) BookQ shall not contain sensitive personally identifiable info about the user other than their name, age, and email to prevent it from being the target of attackers with malicious intent.

6.3.5 Maintainability

- 1) The system shall include clear internal and external documentation to make code easier to understand and modify.
- 2) The system shall allow external retailers to be added or removed easily through configuration files or a database, minimizing code changes.
- 3) The system shall use version control (Git) and a dependency manager to track updates and ensure smooth code maintenance.
- 4) The system shall have automated unit tests and a continuous integration process to detect and prevent bugs in future updates.
- 5) For maintainability, BookQ development should include efficient implementation which practices refactoring.
- 6) The system shall practice encapsulation which uses getter and setter functions to prevent redundant code or repetitive functions.