Lab 1 – Book-Mark

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1 Introduction

In the 21st century, reading has gone to the wayside since the advent of new media and technologies such as video games and the internet (Jones, 2022, para. 12). Despite the mental benefits of reading a book, the appeal of sitting down and reading a book is just no longer a priority for many individuals in today’s day and age (Bavishi et. al., 2016). At the individual level, humans are inherently social creatures. Communicating, sharing, and learning from one another through various dialogue are all intrinsic behaviors that help us as humans grow and develop (Young, 2008). Book clubs are a medium that satisfies the human desire to form relationships with others, as well as the desire to learn and entertain. Due to the benefits of increased cognitive function as well as enjoyment, one might wonder, what is preventing individuals from joining book clubs?

As of 2017, only 5% of Americans partook in a book club or reading group - a small number in comparison to the <53% of American readers in 2017 (National Endowment for the Arts, 2019). For those who are wanting to remain socially and academically active, there are issues that arise outside the cumbersome task of finding a book club. Issues such as time conflicts between group members and the loss of members without a replacement may be large deterrents for those who are lucky enough to have found a book club. In addition to this, those who manage book clubs may have difficulty finding specific software that fits their needs in regard to the scheduling and management of said book club.

The solution to these issues comes in the form of Book-Mark - a mobile application that enables users to attend and manage virtual book clubs granting them the ability to interact with others in a fun and engaging environment. Book-Mark provides individuals a space in
which they can meet with individuals across the world to learn, grow, and have fun throughout the power of book clubs. Through trivia, reading streaks, and rewards, Book-Mark incentivizes individuals within a group to read and retain their read material.

2 Product Description

Book-Mark is a mobile application that allows users to find and create clubs based on books and interests. Book-Mark focuses on small groups to give users a more personal experience with other members and helps with sustaining group activity using machine learning.

2.1 Key Product Features and Capabilities

Book-Mark provides individuals with the ability to attend, host, and manage book clubs in the virtual environment. This online environment will act as a hub for individuals to communicate and interact with one another about their books. The scheduling of meeting times, ability to video call group members, and chat with group members in a small group setting. Book-Mark is the platform that allows readers to search for, join, and interact with a book club via a virtual, mobile medium.

Within Book-Mark, game-like elements are implemented within various features to enhance one’s reading experience. Entertainment through light competition is the aim of these game-like characteristics. One feature that adopts these characteristics is that of challenge questions. Challenge questions are a form of trivia generated by artificial intelligence. Users attempt to answer these trivia questions based on the recently read section in the book. Another feature that aims to bring this heir of competition is that of reading streaks. Users develop a reading streak by recording how many pages they have read everyday. Both challenge questions and reading streaks earn individuals points in exchange for badges that they may flaunt to others.
Features that do not contain the previously mentioned game-like elements also incorporate different forms of artificial intelligence. A notable feature is that of recommendations, in which users are provided with recommendations based on both user and club reading history. Artificial intelligence also provides the feature of providing groups with open-ended questions, helping to create a dialogue amongst group members.

Last but not least, the creation and use of specific chat rooms for the discussion of topics with spoilers is a significant and innovative function implemented within this software. Features such as these have an aim of fostering the development of relationships as well as the incentivizing of learning within a book club.

This application has multiple goals that it accomplishes. First, Book-Mark allows individuals to remain engaged in their pursuit of educating and/or entertaining themselves. By way of the chapter based trivia, reading streaks, and rewards, individuals will have much more incentive to read, rather than they’re own volition. Second, Book-mark provides users with the ability to connect and share their experience with others. Book-Mark acts as a platform from which individuals may interact and compete with one another in regard to sections read from the group's chosen book.

This product solves the problem of the lack of incentivisation within reading, as well as the lack of personalization and intimacy found within small groups. With the integration of game-like features into the hobby of reading, groups of readers, as well as the individual, will have even more of a draw towards this pass time.

2.2 Major Components (Hardware/Software)

As for the hardware components required to support this application, there are 2 that are of utmost importance. The first of the required hardware is that of an iOS or Android mobile
device. This device will be the main device from which users are capable of actively running the application. As for the second piece of hardware required for use of this application, a server is needed to act as the intermediary of data. This server may also come in the form of a standard laptop, desktop computer, dedicated server computer.

Referencing Figure 1 and its relation to hardware, users will first boot up the application from their mobile device. During start up, users will be met with two possible pages. Users may be met with a page asking them to sign up or log in, or they will be met with a page displaying information and chat options in regard to their current book club. From that point on, necessary data will be transmitted to the server. The server will contain user profiles, groups, and corresponding group members. In addition to this, data such as awards, reading streaks and other useful metadata will be held at this location.

As shown in the figure below, chapter summarization, and challenge question generation will occur by way of Natural Language Processing (NLP). NLP is a study within artificial intelligence regarding the comprehension of text. NLP grants individuals the ability to read and analyze text, outputting summarizations or questions about the read content. On the backend, information will be transmitted to and from the server based on user actions. For example, in the circumstance in which a user would like to create or search for a club the server will transmit information accordingly. In addition to this the server sends and receives data for the implementation of voice, text, and video communication. Application Programmable Interfaces (API) are interfaces that allow functional, pre-existing code to be run as a function or service on another project. Through API’s, the communication functionality is implemented.
The application will be developed solely in Java. Java is one of the leading software tools used for the creation of Android applications, and has proven itself to be a vital tool for the development of mobile applications. On the topic of iOS devices, devices made by Apple, applications must be developed in the programming language Swift; one of the only programming languages capable of developing iOS applications. One of the last vital languages used will be SQL, for its ability to manage databases. As to how these applications correspond with one another, much of the computation of rewards, application layout, and information transmission at the user level will be written in Swift or Java, respective to the user's device. From that point, information will be sent to the server, to then be managed using SQL.

When regarding required development tools, there are a number of required software that we are utilizing to develop and maintain Book-Mark. Java and Javascript, will be used throughout the development of the application. These programming languages all have their own
required tools to enable the developer to write with them. Java will be used in the process of developing the user application via Android Studios - an Integrated Development Environment (IDE) with a focus on the development of Android applications. This IDE grants developers the ability to emulate a variety of Android mobile devices to test their in-progress applications. Javascript will be used for the front end of the Book-Mark website, for users who would prefer to use the application on their computer.

3 Identification of Case Study

This product is largely aimed towards 3 audiences. Those who are current readers, looking to socialize with others, as well as individuals who are in search of a way to make reading more fun. Another example of the target audience are those who are in the field of education. Being able to manage groups of individuals and monitor their reading consistency and understanding of content would truly prove itself to be useful for those who educate others.

What all of these individuals have in common, is the want or need to enliven their reading experience. Book-Mark not only enlivens reading, but it makes reading more engaging, fun, and, thanks to the implementation of game-like elements, grants individuals the ability to confirm with themselves that they have some level of understanding of the content.

In regard to performing a case study, a small group of users interested in starting a book club who are willing to test the prototype and provide feedback would be perfectly suited for participation in the examination.

For the sake of stress testing the NLP of the application, a group of individuals who have a reasonably high reading level would be preferred, as more grammatically intricate books would need to be read by the artificial intelligence.
In the future, both students and educators could use this as a means of incentivizing reading within a group of individuals. As mentioned previously, being able to monitor and communicate with individuals regarding various topics of reading content would be a task completed with ease, with the help of Book-Mark.
4 Glossary

JetBrains IDEs: An Integrated Development Environment (IDE) is software designed to simplify the development process of applications by coordinating all programming and debugging tasks from a single application platform through its graphical user interface (GUI).

Toad for SQL Server: Short for Tools for Oracle Application Development, TOAD is a set of development tools used for application development, database development, or business intelligence and assists developers in deploying Oracle-based applications and Web services on the Windows platform.

GitLab: GitLab is a DevOps platform where software development and IT operations teams collaborate in one place. It aims to increase work efficiency and accelerate product delivery with better security.

React Native: React Native is an open-source UI software used to develop applications for Android, Android TV, iOS, macOS, tvOS, Web, Windows and UWP.

Spring Boot: An open source Java-based framework used to create a micro Service.

JSDoc 3: JSDoc 3 is an API documentation generator for JavaScript.

JavaDoc: A documentation generator created by Sun Microsystems for the Java language for generating API documentation in HTML format from Java source code.

Jest: A JavaScript testing framework built on top of Jasmine and maintained by Meta.

JUnit 5: a unit-testing framework in the Java ecosystem.
**MirrorFly**: An in-app voice, video & chat SDK provider built for businesses to integrate a communication solution on Android, iOS and Web platforms.

**AWS**: Amazon Web Services, or AWS, is a cloud computing platform from Amazon that provides customers with a wide array of cloud services.

**JavaScript**: JavaScript is a lightweight programming language used to build and manage dynamic and interactive web elements. It is considered both a client and server-side language.

**HTML**: Hypertext Markup Language (HTML) is the primary language standard used to organize and format web pages and other documents on the World Wide Web.

**CSS**: Short for Cascading Style Sheets, a new feature being added to HTML that gives both Web site developers and users more control over how pages are displayed.

**Java**: Java is a general purpose, high-level programming language first released by Sun Microsystems in 1995. It is designed to have as few implementation dependencies as possible, is free to use, and can run on all platforms. It is concurrent, class-based, and object-oriented.

**SQL**: SQL is a standardized query language for requesting information from a database. It is an abbreviation for structured query language and is pronounced as separate letters, although some users pronounce it see-kwell.
5 References


https://wistia.com/learn/marketing/the-science-behind-gamification


[23] https://readinggroups.org/news/why-join-a-reading-group - to be completed