Cue

by Project Orange

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What is your project?

Cue is a mobile application that allows its users to create and share flashcards for studying. Users of Cue will be able to create decks of flashcards and save them directly on their own personal cloud. If they choose, users can make their flashcard decks public so that other people can use them too. Alternatively, decks can be shared with specific users. Cue will also support an offline mode that will enable decks to be used even when the network is unavailable. Users will even be able to create copies of public decks so that they can fine-tune them to their needs.

Why is it interesting?

Cue reinvents the traditional method of using flashcards as a memorization aid with new functional and collaborative features. Students can use Cue to study alone, or make use of its collaborative features to study together with other students. Cue also allows students to search and discover public flashcard decks according to their interests.

Describe and justify your project selection.

Having studied at Waterloo for many years, we decided to reflect on our experiences as students and identify pain points we felt we could help alleviate. Some of the pain points we identified were studying and retaining course material. We decided on this project because we felt that we could leverage the use of technology to improve the student experience in a material way by creating new ways to study alone and study collaboratively.

Why does this project make sense in a mobile form factor?

Cue is a study tool that will be built with two things in mind: mobility and collaboration. The application will feature an offline mode that allows users to take their flashcard decks with them wherever they go. Users will be able to study anywhere they want like on the bus or in the car, turning their commute time into study time! In terms of collaboration, mobile devices have become the epicenters of connectivity. Cue will enable its users to share their decks with other users, or with the general public if they so choose. Cue hopes to foster a highly collaborative environment where users are encouraged both to create their own content and to reuse content from other users.

Functional Properties of Cue

1. Create, edit and delete flashcards
2. Synchronize flashcard decks with the user's personal cloud
3. Manage decks of flashcards
    1. Create, edit, and delete decks
    2. Share decks with specific users
    3. Create public decks that everyone can use
    4. Transfer ownership from one user to another
    5. Rate public decks
    6. Copy public decks
4. Offline mode
    1. Use and edit decks from the user's library without an Internet connection
    2. Synchronize changes made upon reconnection
5. "Play" decks
    1. Advance, go back
    2. Tap to flip the card
    3. Shuffle
    4. Mark specific cards that need to be reviewed again
    5. Play through the deck with all cards flipped answer-side up

User Scenarios

The first scenario in which users would interact with our system would be when they are looking to create flash cards as an additional tool for studying. Users would be required to go through their own personal notes and pick out important sections or facts that they believe require additional review. That information can then be condensed into flash card form through our application and be ready for personal use.

Flashcards will also be available online from those users that decided to publicly release their own decks and other users will be able to browse and search through public decks that are related to their own field of study.

The second scenario will be for when a user now has a deck of flashcards loaded on their phone, made by themselves or from a remote source, and is ready to study from them. The user can shuffle the deck and swipe through each individual card to test themselves. Along the way, users will be able to skip ahead, go back, and even mark cards that they want to review again. Once the user has swiped through the entire deck, they can go to a review page where the cards they marked will be shown to allow for review on topics that need further attention.

Nonfunctional properties of Cue

Dependability (Fault Tolerance)

Users will still be able to create, edit, and use decks from their libraries even when they have no Internet connection. On mobile devices, stable network connectivity cannot be assumed (e.g., a user may not have cellular service, a cellular data plan, or be connected to a WiFi network). Taking this into consideration, achieving Fault Tolerance in Cue will allow the app to continue functioning even in poor or no network conditions. This avoids having a single, easy point of failure for the app. For example, during a user's commute, they may not have cellular service while underground on the subway, but they may want to review their flashcards.

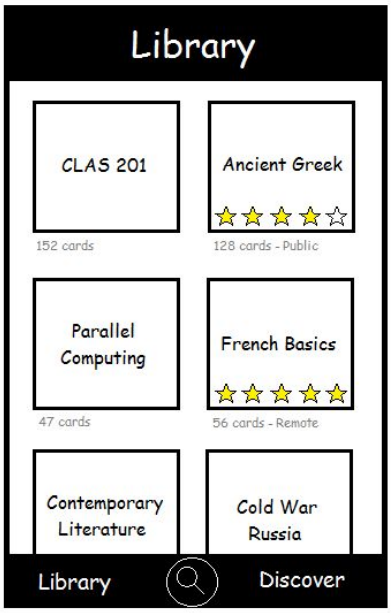
Scalability

The application will support the creation, viewing, and editing of decks containing up to 500 flashcards and will support up to 100 decks of flashcards in each user's library (device space permitting). By supporting at least 100 decks with at least 500 cards each, Cue will be able to provide a pleasing and consistent experience for users that stay within those limits. These limits are generous and should likely fill the needs of the vast majority of Cue's users.

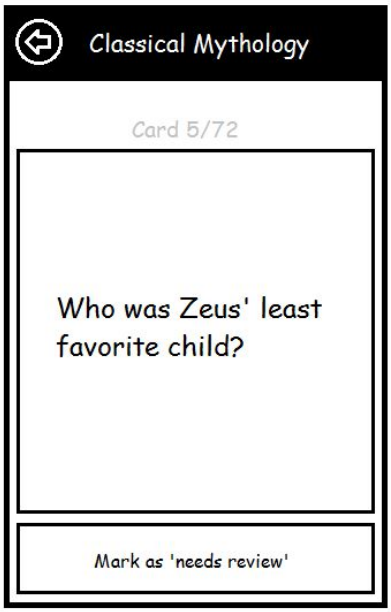
Portability

Our application will be able to run on both iOS 9+ and Android 5+ devices. On both platforms, it will retain all of its functional and nonfunctional properties. By having all of the same features on both platforms, none of Cue's users will feel excluded. It is also important to have a consistent experience that is device-agnostic.

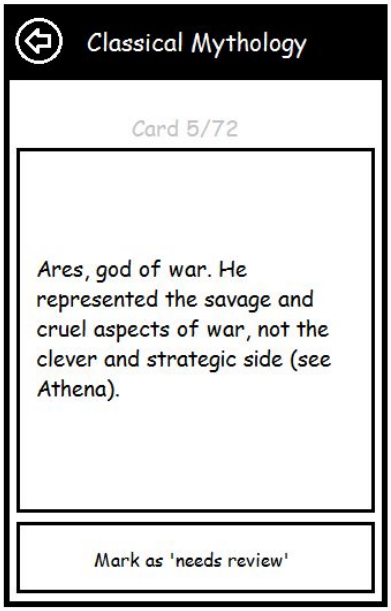
Low-Fidelity Mockups



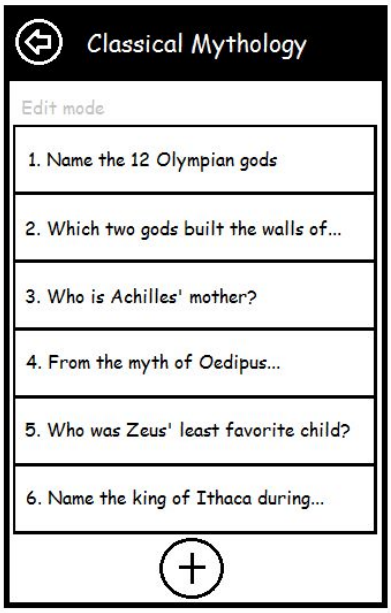
On the left, we have a library view showing a user's collection of flashcard decks. Decks that are owned by the user and are public have ratings, so do remote decks that this user has included in their library. At the bottom, users can tap the search icon to search for public decks, or tap the discover button to see popular and highly rated decks.



Here we have a user part-way through a deck of flashcards. The user can return to the previous screen by hitting the back button in the top left corner. The user can go back or forward by swiping right or left respectively. If the user needs to spend more time studying this particular card, they can mark it as "needs review". If the user wants to see the opposite side of the flash card, they can simply tap the card to turn it over (see next image).



Here we can see the opposite side of the flashcard from the previous image. The user can perform all of the same actions from here as they could in the previous state where the flashcard was showing its other side.



In this image, the user has entered edit mode on the “Classical Mythology” deck. From this overview, the user can delete cards from the deck, add new cards, or select existing cards to edit. The user can exit this mode by pressing the back button in the top left corner.