**HO CHI MINH CITY NATIONAL UNIVERSITY**

**UNIVERSITY OF NATURAL SCIENCES**
FACULTY OF INFORMATION TECHNOLOGY

# PA2

# PROJECT PROPOSAL

Subject: User Interface Design

**Instructor guides:**
MSc. Lê Khánh Duy
BSc. Hồ Tuấn Thanh
BSc. Phạm Nguyễn Sơn Tùng

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# A. INTRODUCTION

## 1. Group information

| GROUP 14 | | | |
|---|---|---|---|
| **No.** | **Student ID** | **Full name** | **Email** |
| **1** | 21127234 | Nguyễn Lê Anh Chi | nlachi21@clc.fitus.edu.vn |
| **2** | 21127235 | Nguyễn Xuân Quỳnh Chi | nxqchi21@clc.fitus.edu.vn |
| **3** | 21127495 | Lê Ngô Song Cát | lnscat21@clc.fitus.edu.vn |
| **4** | 21127659 | Bùi Ngọc Kiều Nhi | bnknhi21@clc.fitus.edu.vn |

## 2. Assign task

| No. | Responsibility | Task | Level of completion |
|---|---|---|---|
| **1** | Nguyễn Lê Anh Chi | 1.1, 1.2, 3.2 | 100% |
| **2** | Nguyễn Xuân Quỳnh Chi | 3.1, 3.2, 4.1 | 100% |
| **3** | Lê Ngô Song Cát | 2.3, 3.3, 4.2 | 100% |
| **4** | Bùi Ngọc Kiều Nhi | 2.2, 3.3, 4.3 | 100% |

# B. PROJECT PROPOSAL

## 1. Introduction

### 1.1. Purpose of the Proposal:

- The purpose of this proposal is to present the initial concepts for design solutions aimed at addressing the identified problems users face when learning English vocabulary through online flashcards.
- The proposal outlines the scope of the project, summarizes the user research conducted, and highlights key problems and potential solutions that will guide the development of an effective learning platform.

### 1.2. Scope of the Proposal:

- This proposal focuses on improving user experience when learning new English words through online flashcards but in a more engaging and interesting way, with the help of short contents and OCR.

## 2. User Research Summary

**2.1. Research Methods:** Interview, Observation, Try It Yourself.

### 2.2. Key Findings and Insights

- Observed several critical insights from the user research, including:
  - Difficulties and challenges encountered by users: Lack of Context, Confusing Similar Words, Disorganized Sets, Mixed Knowledge Levels, Customization Fatigue, and Lack of Engagement.
  - Strength of online flashcards: Structured Learning, Spaced Repetition, Customization, Multisensory Engagement, and Convenience.
  - How people usually learn new words naturally: Contextual Learning, Repetition and Usage, Interest and Motivation, and Mnemonics and Associations.

### 2.3. Selection of Key Problems to Solve:

- Based on the user research and analysis, the following key problems were selected for focused solution development:
  - Lack of Context for Words
  - Boring and Non-interactive Flashcards Design

## 3. Conceptual Design Solutions

### 3.1. Overview of the Design Concepts:

- In this section, we'll introduce the proposed design solutions aimed at addressing the primary user problems identified during the research phase. The design concepts focus on enhancing user experience by providing innovative and effective methods to overcome memory retention issues, ensuring contextual usage of vocabulary, and boosting motivation and engagement.

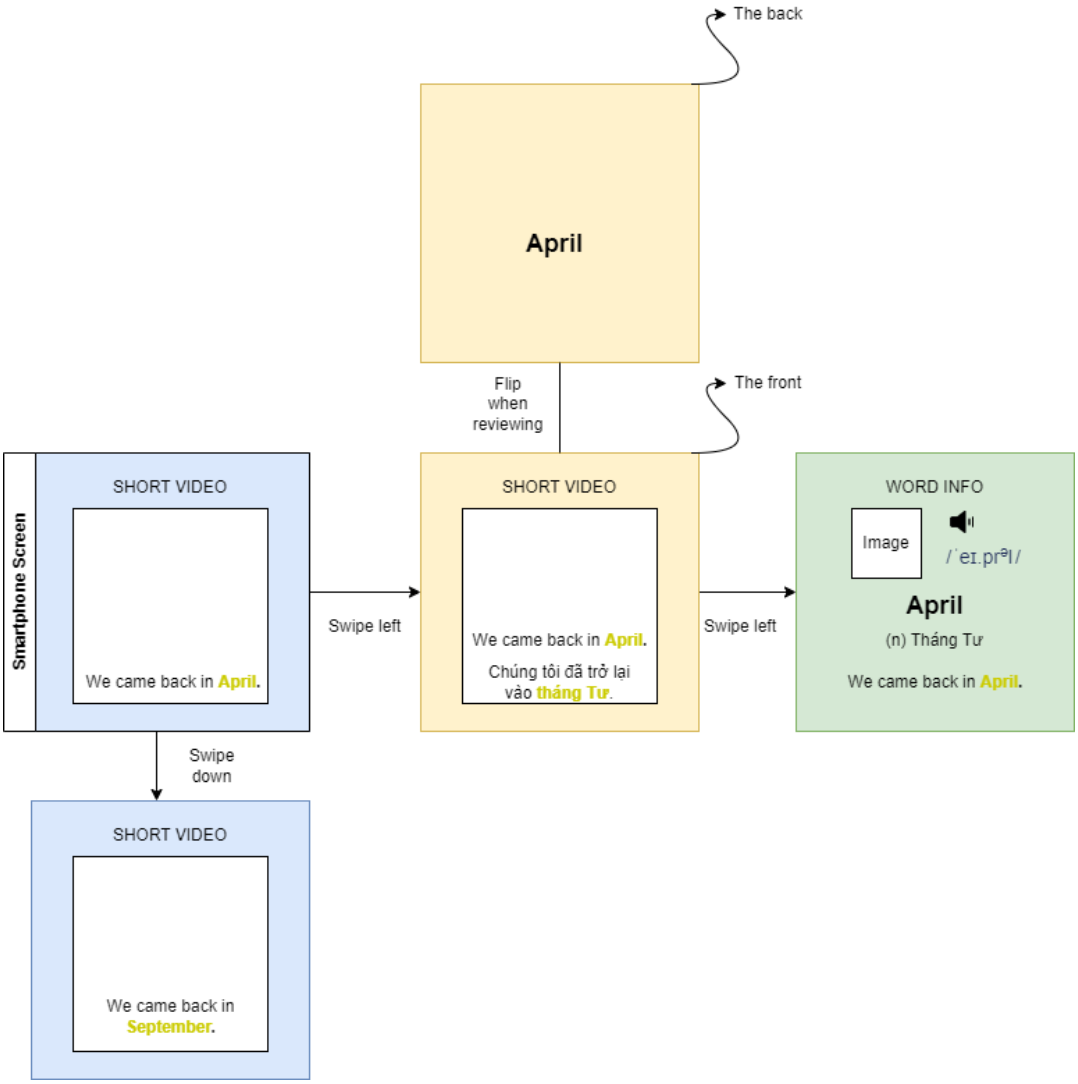
- Each conceptual solution has been crafted based on user needs and preferences, leveraging proven techniques and modern technology to create a good vocabulary learning platform. By integrating various interactive, personalized, and scientifically backed approaches, we aim to create a robust solution that significantly improves the vocabulary learning process for users.

### 3.2. Solution 1: English vocabulary learning application through flashcards

- **Description**: In response to the growing popularity of short-form content, we aim to develop a flashcard app that taps into users' natural vocabulary acquisition through engaging, bite-sized videos. This approach combines entertainment with education, making vocabulary learning seamless and enjoyable.
- **Key Features:**
  - **Integration with Short-Form Content:**
    - The app presents users with a curated selection of short videos, aligning with their interests and popular trends.
  - **Highlighted Vocabulary:**
    - Each video includes captions, with a specific new word highlighted to provide context. This word is chosen for its relevance and usefulness.
  - **Interactive Learning:**
    - Users interested in the highlighted word can swipe to the right to reveal the word information.
  - **Effortless Word-saving:**
    - Users can save the new word to their personal vocabulary list for future review by simply tapping a "Save" button.
  - **Spaced Repetition:**
    - We will schedule the review of learned vocabulary for users according to the Spaced Repetition method, since Spaced repetition enhances long-term retention and recall efficiency by strategically timing reviews to reinforce memory just before forgetting occurs.
  - **Comprehensive Flashcards Design:**
    The structure of a flashcard is as follows:
    1. **First Side:** A short video with English subtitles (engsub) providing the context for the word, with the word highlighted.
    2. **Second Side:** The same video, but with both English and Vietnamese subtitles (vietsub), with the word highlighted in both languages.
    3. **Third Side:** Information about the word, including an image, part of speech, pronunciation, meaning, and an example sentence from the video.
- **Learning process:**
  - **Learning New Words:**
    - On the smartphone screen, the learner will see the first side of the flashcard. They will watch the video and use the engsub to guess the meaning of the word in context. This guessing stimulates curiosity and engagement with the new word.

- Then, when the learner swipes left to the second side (second front side), they watch the video with added vietsub to check if their guess was correct.
- Finally, when the learner swipes left again to the third side, the word's information appears, helping them solidify their understanding and knowledge of the word.
- Learners can swipe up or down to move between different flashcards.

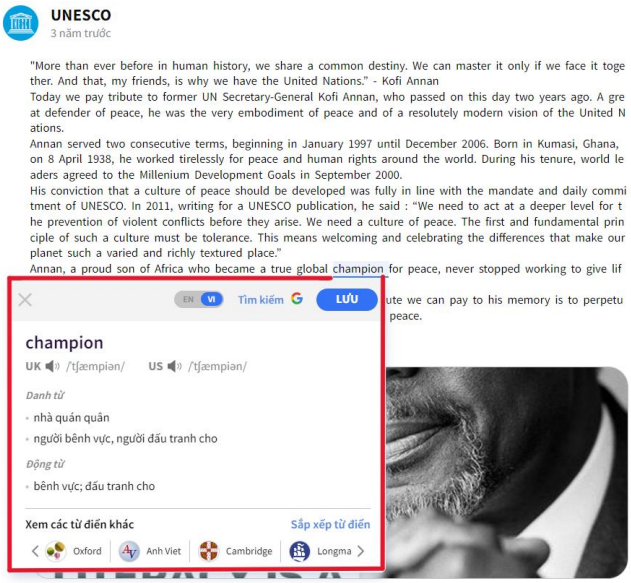
- **Reviewing Learned Words:**
  - The app also provides a feature to save new words to the learner's personal vocabulary list.
  - During review sessions, on the smartphone screen, the learner will first see the second side at the back (second back side), displaying the word they need to review. The learner will try to recall the word's meaning.
  - While reviewing, they can swipe left to see the word's information or swipe right to watch the context video again.



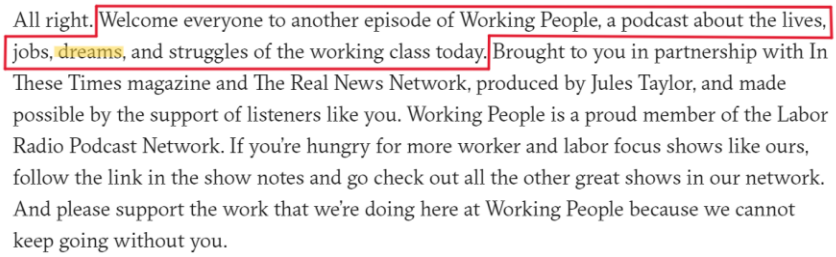
- **Benefits:**
  - **Contextual Learning**: Users learn new vocabulary within the context of engaging, relevant videos, which aids in better understanding and retention.
  - **Convenience**: The integration of vocabulary learning into short-form content makes the process enjoyable and non-disruptive.
  - **Engagement**: Leveraging popular short-form content keeps users engaged and motivated to learn.
  - **Advanced Technology**: Spaced repetition and multimedia integration ensure efficient learning and data processing.

### 3.3. Solution 2: Automatic flashcard creation application

- **Description:** Develop a sophisticated flashcard application that integrates seamlessly with users' daily activities on their smartphones or tablets. The app will enhance vocabulary learning by capturing new words in their real-life context and leveraging image processing technology for efficient data processing.
- Process of using the application: When learners encounter a new word in reading materials (e.g., e-books, Facebook posts, articles), they use the app to automatically retrieve information about the word. The app will then generate a flashcard and add it to the learner's personal list. The only task remaining for the learner is to add an example sentence into the flashcard, which is the one from the context where the word was found.
- **Key Features:**
  - **Seamless Integration:**
    - The app operates in the background, monitoring for user-selected words across various apps and platforms, such as Facebook, news readers, and more.
  - **Instant Information Display:**
    - Upon selecting a new word, the app displays a small, non-intrusive popup providing essential details about the word, including its definition, part of speech, and pronunciation.




- **Effortless Word Saving:**
  - Users can save the word by simply tapping the "Save" button on the popup. This triggers an automated process that enhances the user experience.
- **Context Preservation:**
  - The app captures a screenshot of the user's screen when the word is selected.
  - OCR (Optical Character Recognition) technology detects and extracts text from the screenshot, highlighting the new word within its original context.
  - The application then adds the contextual sentence into the card.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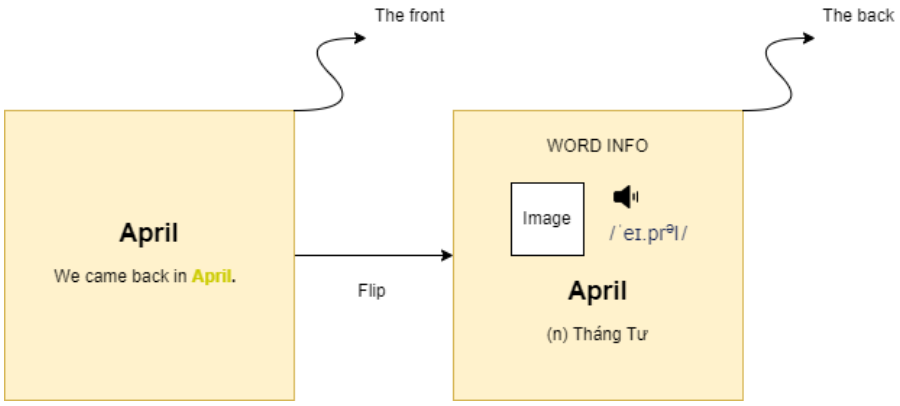
- **Comprehensive Flashcards:**

  The structure of a flashcard is as follows:
  - **The Front:** The word and a contextual example sentence from the screenshot (sourced from the user's reading).
  - **The Back:** Information about the word to be learned.

  Users can click or swipe to flip between the front and back of the card.




- **Enhanced Learning Experience:**
  - By preserving the context in which new words are encountered, the app aids in deeper understanding and better retention of vocabulary.
  - Spaced repetition algorithms schedule flashcard reviews, optimizing learning and memory retention.

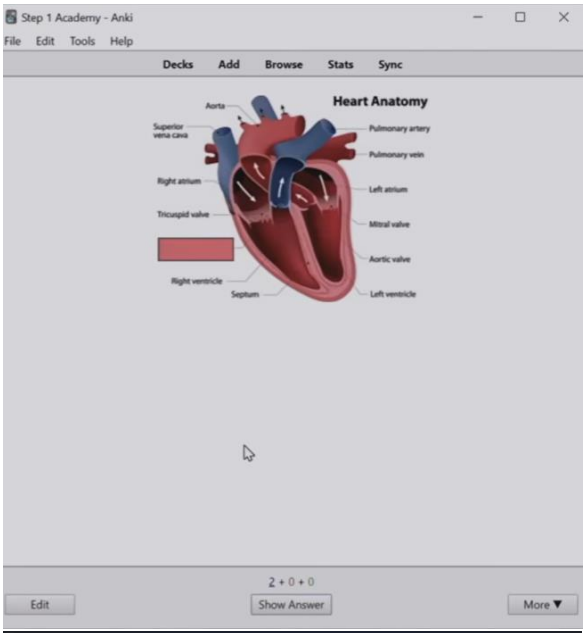
- **Benefits:**
  - **Contextual Learning:** Users learn new vocabulary within the context it was found, aiding in better understanding and retention.
  - **Convenience:** The app's seamless integration and automation make it easy for users to capture and learn new words without interrupting their regular activities.
  - **Advanced Technology:** Utilization of OCR and spaced repetition algorithms ensures efficient data processing and effective learning.

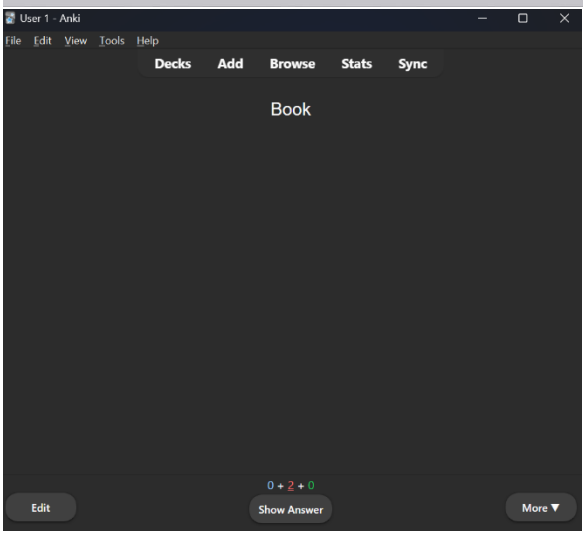
# 4. Comparison with Existing Solutions

## 4.1. Overview of Existing Solutions:

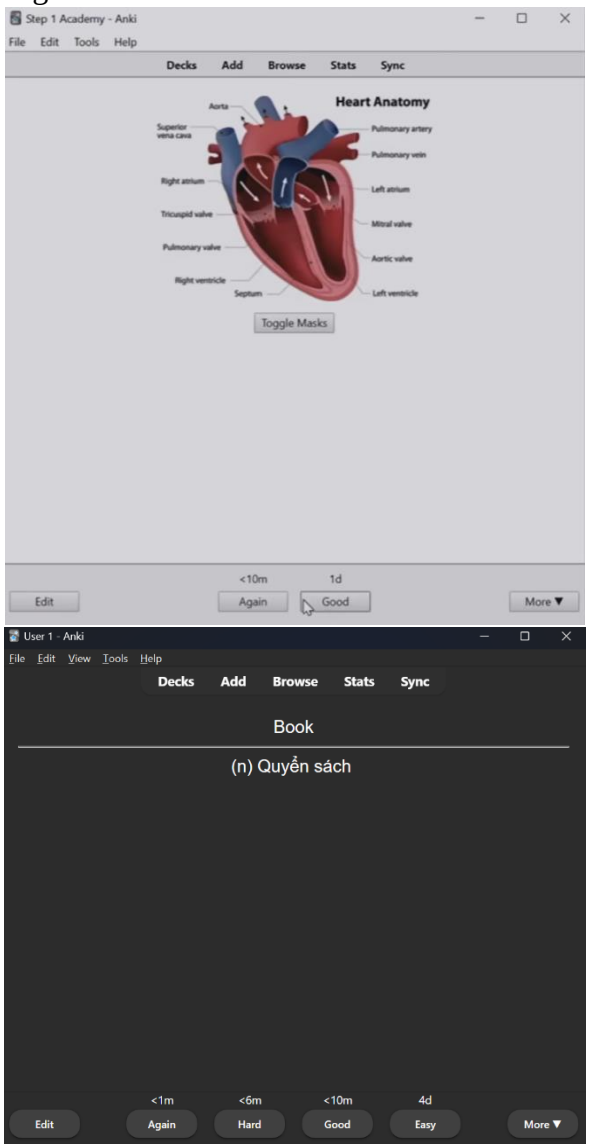
To provide context, we will first give a brief overview of solutions of some of the existing learning through flashcards applications/Websites in the market:

- Anki: The design of Anki flashcards is unattractive and monotonous, with low interactivity. Anki is merely a tool for creating flashcards, so learners must create their own sets, which leads to significant time spent finding materials and visual images for the words they want to learn. Additionally, users cannot add videos to the flashcards.
  The card before answering:

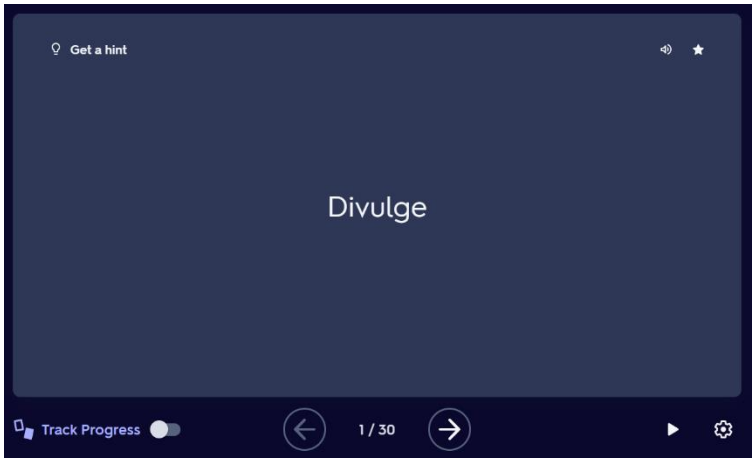

Step 1 Academy - Anki
File Edit Tools Help
Decks Add Browse Stats Sync
Heart Anatomy
Aorta
Superior vena cava
Right atrium
Tricuspid valve
Right ventricle
Septum
Pulmonary artery
Pulmonary vein
Left atrium
Mitral valve
Aortic valve
Left ventricle
2 + 0 + 0
Edit
Show Answer
More ▼


User 1 - Anki
File Edit View Tools Help
Decks Add Browse Stats Sync
Book
0 + 2 + 0
Edit
Show Answer
More ▼

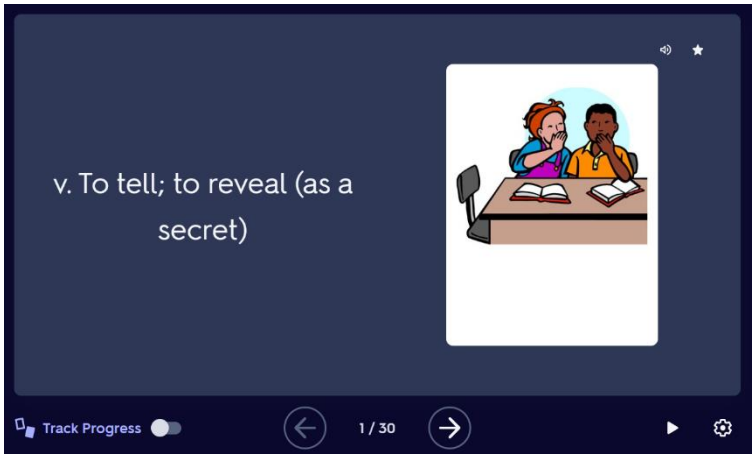
The card after answering:




- Quizlet: The design of Quizlet flashcards is monotonous, plain, and lacks interactivity (users only flip between the front and back of a flashcard). Sometimes, there are no contextual example sentences for the words.
  The front:




The back:




### 4.2. Gaps in Existing Solutions:

- **Lack of Context for Words:** Some flashcards often present vocabulary words in isolation with a definition or translation, without showing how the words are used in meaningful sentences or real-life situations.
- **Boring and Non-Interactive Flashcards Design:** Online flashcards are designed with a static, monotonous format, lacking interactive or engaging elements.
- **Spending a Lot of Time Creating a Custom Deck of Flashcards:** Creating custom flashcard decks can be a time-consuming process, involving selecting vocabulary, writing definitions, and possibly adding multimedia elements.
- **Lack of a Common Theme:** Flashcard decks consist of vocabulary words randomly selected or organized without a cohesive theme.

### 4.3. How the Proposed Solution Addresses These Gaps:

- **Lack of Context for Words:** For each flashcard for a word, we add context with a short video that highlights the word. This allows users to infer the word from the context and understand how it is used in real life. Learning words in context helps learners remember them longer. Additionally, videos are an engaging multimedia type that captures attention and makes the learning experience more enjoyable.

- **Boring and Non-Interactive Flashcards Design:** We improve the flashcard design to make the user's flashcard experience like their TikTok browsing experience.
- **Spending a Lot of Time Creating a Custom Deck of Flashcards:** We develop a tool to help learners save time on vocabulary creation by automatically generating flashcards with complete word information. The only task left for the learner is to add context to the word.
- **Lack of a Common Theme:** We offer a feature to build multiple sets of flashcards with a variety of themes. Learners can choose the themes they prefer.