

BLINDARY (WIT.AI)

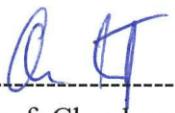
MISTER CHAYUT UPATHAM
MISS JIRATTIKARN SASITHORN
MISS THITIRAT SUNTARAPORNPOL

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REQUIREMENTS FOR
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Mr. Chayut	Upatham
Miss Jirattikarn	Sasithorn
Miss Thitirat	Suntarapornpol

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Project Committee



(Asst. Prof. Chonlameth Arpnikanondt, Ph.D.)

Member and Project Advisor



(Mr. Suthat Ronglong)

Member and Co-Project Advisor



(Asst. Prof. Bunthit Watanapa, Ph.D.)

Member



(Asst. Prof. Chakarida Nukoolkit, Ph.D.)

Member

Project title	Blindary (Wit.ai)
Project Credit	3
Candidates	Mister Chayut Upatham Miss Jirattikarn Sasithorn Miss Thitirat Suntarapornpol
Advisor	Asst. Prof. Chonlameth Arpnikanondt, Ph. D
Program	Bachelor of Science
Field of Study	Computer Science (English Program)
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Abstract

Before the Internet became so common, reading a book was the best way to gain knowledge and information. However, it has always been hard for the blind to find braille books to read because they are very expensive and most are in English. However nowadays, people can access content on the Internet easily by using a smartphone or laptop. So, we decided to do the Blindary project. The aim was to provide more alternatives for the blind to access books, specifically for people in Thailand. This project was divided into two groups which were audiobook production and audiobook playback production. Our group was audiobook playback production. Using the audiobooks provided by the other group, we made a website for the blind to listen to the audiobooks. In addition, our website was designed to be easily accessible for the blind. Therefore, the blind can use many devices to access the website. Also, we used natural language processing(NLP) so that blind users can interact with the website. We asked a group of blind people several questions about problems that they had faced while surfing the Internet and their expectations of an audiobook website. Finally, we delivered an effective and suitable audiobook website for the blind.

Keywords: Blindary/ Wit.ai API / blind/ NLP/ Youtube IFrame API/
Google Book API/ audiobook/ online library

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CHAPTER 1

INTRODUCTION

1.1 Background

Nowadays, the number of people who can access the Internet is increasing. They are not only people who can see like us but also people with disabilities, particularly blind people. The blind can use both computers and smartphones as do people who can see. An application that many blind people are using currently is Read for the Blind. It helps blind people access books and short stories. However, the current version of Read for the Blind cannot meet all the demands of users. Also, there are some other problems with the application. The blind need to have a smartphone to use the application. Android smartphones cannot adjust the speed of the speech, but iOS smartphones can. Also, some of the blind do not have a smartphone, so they cannot use this application. After we learned about the problems, we decided to create a new application on a web platform that can be used by all devices. This web application is going to help blind people access audiobooks and short stories. We have separated the project into two parts. One part is audiobook production, and the other part is audiobook playback. Both parts are going to be developed by separate teams. Our group will focus on the audiobook playback. Meanwhile, the other group will focus on audiobook production.

1.2 Objectives

After we observed the difficulties of accessing books for the blind, we understood why they cannot read books like other people. Mostly, the ways to find and access books are difficult. So, we decided to make a new web application that is easy for the blind to use. We will make a web application so that the blind can access the books that they want by using a UI specifically designed for the blind. Then blind people can request books that they want and find books that they want to listen to in our application by category. Moreover, we are going to put the content in a grid pattern. For example, the buttons will have the same size and same gaps on each page. Also, we will use colors in the UI that the color blind can see easily. We will use AI to help users interact with the application.

1.3 Scope

- Build AI that is able to interact with the blind
- Make an audiobook player
- Request new books for the blind
- Create a user friendly interface

1.4 Expected Benefits

- Improve the chances of the blind being able to access content
- Meet the needs of blind users

CHAPTER 2

FEASIBILITY STUDY

2.1 Introduction

In Thailand, there are about 600,000 blind people. In other words, about 1% of the Thai population is blind. Most of the blind have less opportunities to learn new things because they cannot see. So, it is hard for them to read books unlike other people, and it is harder for them to learn unlike people who can see. Although there are some applications for smartphones that can help the blind access books, not all blind people have smartphones. For these reasons, we want to help blind people by creating a website that helps them access many kinds of books. The blind can access the website by many devices that can connect to the Internet, such as smartphones, tablets and computers. Also, this website will help the blind to learn new things and gain more knowledge. They will easily access the website and listen to the audiobooks that they want because we will design the website especially for the blind.

2.2 Problem Statement

Blind people cannot access books like other people do. Most applications and websites are not designed for blind people, so they have to spend time to become familiar with them before they can use them. Most applications cannot meet the needs of blind people, and some applications are not designed for color blind people, who cannot see colors in applications correctly. Moreover, the designs of applications have to be specifically made for the blind. Because of this, we will use Usable Accessibility Design to create our web application. This means the buttons in our application will be the same size and aligned in grids. In addition, we will use AI that interacts with the blind when they are searching for books and using control commands on the playback page.

2.3 Related Research and Project

2.3.1 Read for the Blind

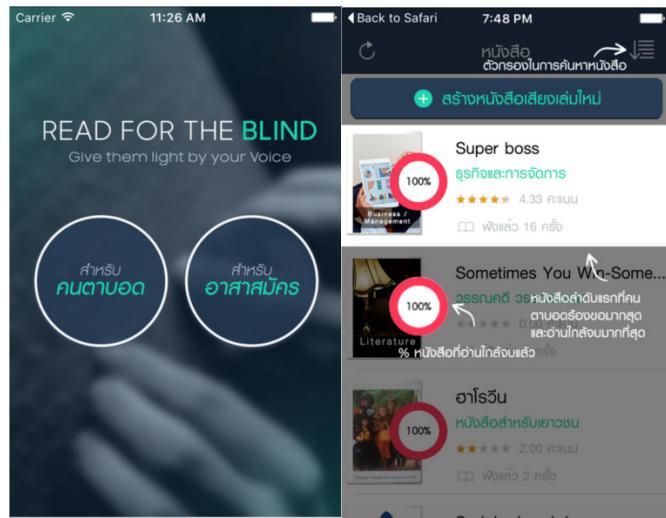


Figure 2.1: Read for the Blind Application

Read for the Blind is an application from the Thailand Association of the Blind. The system is divided into two parts, which are the volunteers part and the blind part. Volunteers can help blind people by reading a book, recording their voice, or uploading a recording. To use the blind part, the blind need to log in first, so they must get an ID from the Thailand Association of the Blind. After that, they can choose which books they want to listen to. Also, they can choose which reading voice they like to listen to.

2.3.2 TAB2Read

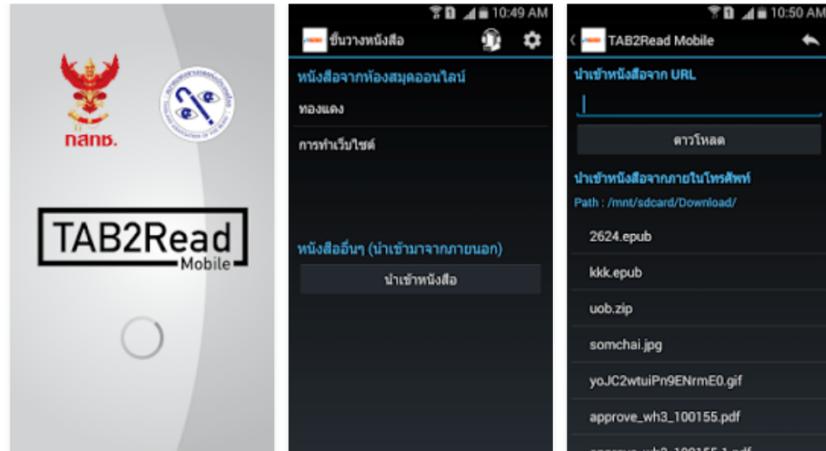


Figure 2.2: TAB2Read Application

The TAB2Read application is also provided by the Thailand Association of the Blind, but it is only for blind people. This application is a DAISY audiobook format reader. It can read books or text to the blind. To use this application, users import books to their device. Users can control the speed and volume of audiobooks by themselves.

2.3.3 Smart AudioBook Player

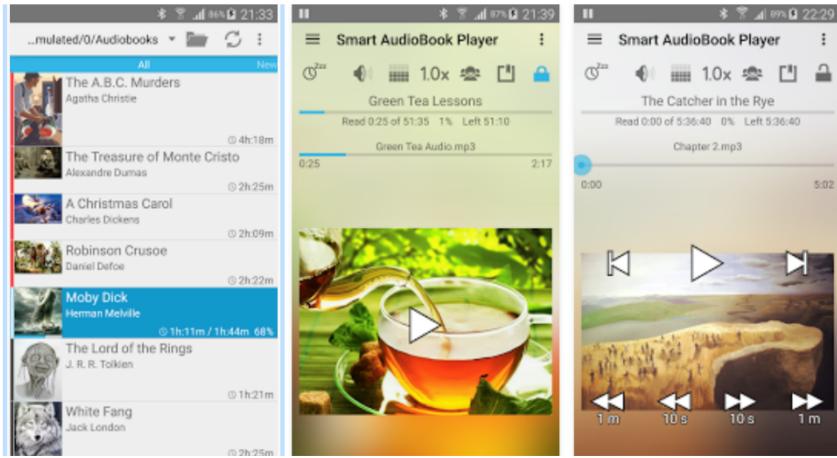


Figure 2.3: Smart AudioBook Player Application

The Smart AudioBook Player application was made by Alex Kravchenko. It is designed especially for playing audiobooks. However, this application is not designed for use by blind people, so it can be hard for blind people to use it.

2.4 Requirement Specifications

- Can log in by using username
- Can connect their device to the Internet
- Can allow users to control speed of playback
- Can recommend books
- Can receive feedback from users
- Can allow users to ask for new books by typing or saying a book's name to search for it

2.5 Implementation Techniques

2.5.1 Software

- Brackets
- Sublime
- Cyberduck
- Photoshop

2.5.2 Computer Languages

- PHP
- HTML
- JavaScript

2.6 Deliverables

- Documentation
- Source code of the application
- Poster

2.7 Implementation Plan

2.7.1 Task Description

Table 2.1 shows the duration and description of each task and how each task is related to other tasks.

Table 2.1: Task Description

Task No.	Description	Duration(days)	Dependencies
T1	Brainstorm to select a topic	1	-
T2	Discuss the project	1	T1
T3	Find the details that are necessary for the project	3	T2
T4	Submit draft topic	1	T3
T5	Research technical details	5	T4
T6	Submit draft-proposal	2	T5
T7	Find more information about users	10	T6
T8	Discuss the scope	2	T7
T9	Identify the problem	1	T7
T10	Submit chapters 1-2	1	T8, T9
T11	Prepare for feasibility presentation	14	T10
T12	Feasibility Presentation	1	T11
T13	Discuss the problem and poster	10	T12
T14	Improve document and make the poster	10	T12
T15	Submit chapters 1-2 and poster	1	T13, 14
T16	Discuss the problem with real users	3	T15
T17	Submit chapter 3	1	T16
T18	Design Presentation	1	T17
T19	Edit chapters 1-3	5	T18
T20	Submit chapters 2-3 and poster	1	T19

Table 2.1: Task Description (cont.)

Task No.	Description	Duration(days)	Dependencies
T21	Develop an alpha version	80	T20
T22	Test and debug the application	20	T21
T23	Demo Alpha software	1	T22
T24	D-Day for Beta software	1	T23

2.7.2 Gantt Chart

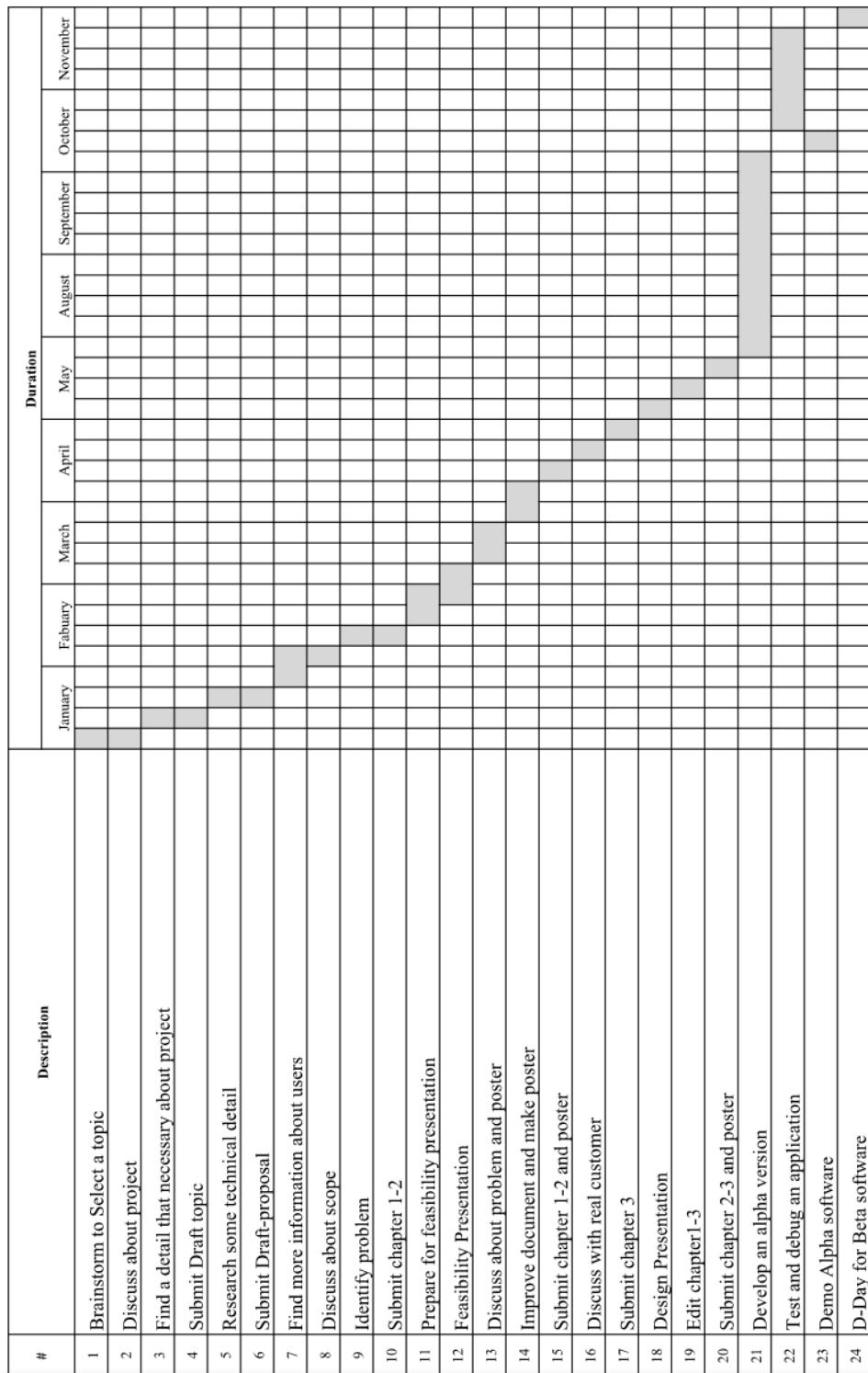


Figure 2.4: Gantt Chart

Figure 2.4 shows the schedule of project. The schedule plan helps us to work more efficiently by showing when we should finish each task.

2.8 Project Success and Failure

This part shows the main tasks of the two groups and shows the information that the two groups have to share together.

2.8.1 Task

2.8.1.1 Playback

- Design the user interface for the blind
- Test the user interface for accessibility
- Design the database for the blind
- Make audio able to play on the website
- Make it so users can control the speed of the audio
- Use NLP to help users to search for audiobooks
- Connect with the production part of the project
- Test and fix bugs

2.8.1.2 Production

- Design the user interface
- Design and maintain the database
- Use Google Books APIs to search for and retrieve book information
- Develop a voice recording system
- Provide an audio editor tool on the website
- Upload and manage each user's voice
- Use YouTube to store the audio
- Connect with the playback part of the project
- Get book suggestions and feedback from the blind
- Testing and debugging

2.8.1.3 Information that we have share together

- Audio recordings of audiobooks
- Feedback of the blind
- Book suggestions from the blind

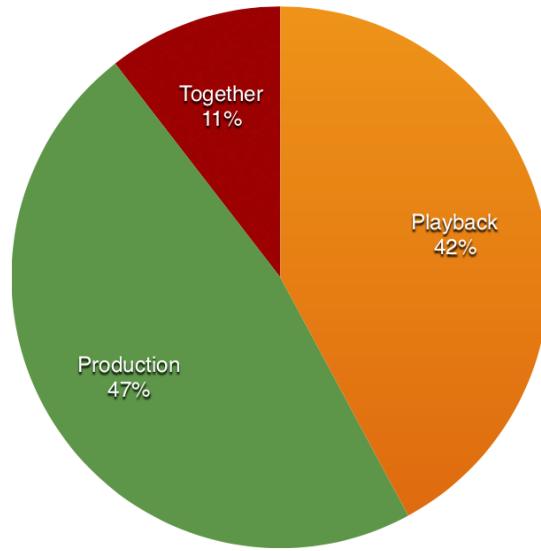


Figure 2.5: Percentages of Tasks

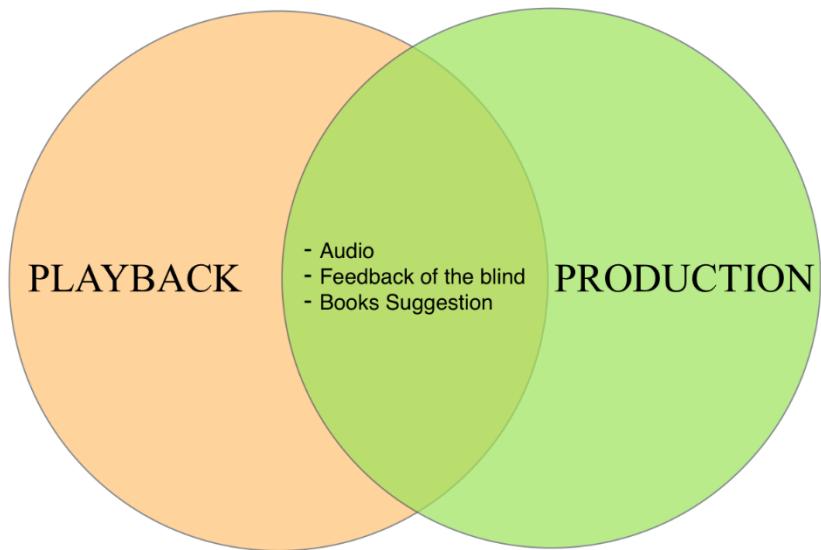


Figure 2.6: Information that the Two Groups Share

Figure 2.5 shows the proportions of tasks in Blindary by percentage. The information that the two groups share is shown in figure 2.6

2.8.2 Program Success Rate

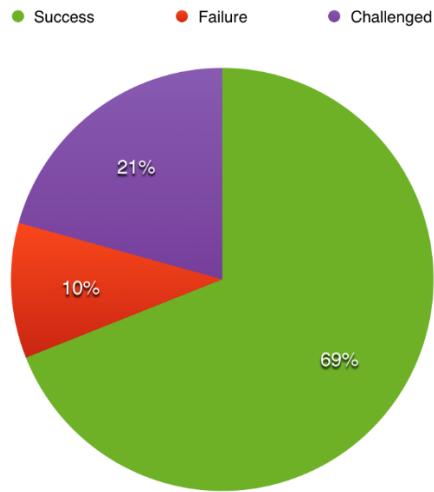


Figure 2.7: Percentages of Success, Failure and Challenge

Figure 2.7 shows the success percentage, failure percentage, and challenged percentage of the project. We have listed some possible successful accomplishments and problems that can occur during our project below.

2.8.2.1 Success

- The project is finished on time
- The project meets all requirements
- The blind can use the website with easy access
- The website can use the data from the other group

2.8.2.2 Challenged

- It might take a longer time than we expected to complete the project
- Some problems with technical details might occur
- The website has to be easy for the blind to use
- The website has to be able to combine the functions from both two groups

2.8.2.3 Failure

- The project may not have been well planned
- Not enough communication may occur between the two groups

If the other group does not finish on time, we plan to make a prototype of the audiobook and use it in the Blindary website instead.

CHAPTER 3

SYSTEM ANALYSIS AND DESIGN

3.1 Introduction

This chapter describes the design of the project. System analysis and design is one of the most important tasks in a project because a better design can help to reduce problems that might happen in the future. Especially, this chapter is about the appearance of the website. First, it covers how to make the website easy for the blind to use. Second, it covers the design of the database which is made to work efficiently with the website. This chapter also includes the use-case diagram, flow chart, and more.

3.2 Existing System Analysis

There are some applications and websites that were made for the blind, but most are mobile applications. Table 3.1 shows the comparison of the Blidary website to the existing mobile applications.

Table 3.1: Existing System Analysis

Application Name	Existing Mobile Applications	Blidary Website
Read for the Blind	Can be used only on smartphones	Can be used both on computers and smartphones
Read for the Blind, Tab2Read	Search for books by typing	Search by typing or voice command
Read for the Blind, Tab2Read	Cannot comment on audiobooks	Can send feedback to volunteers
Read for the Blind, Tab2Read	Cannot request books directly	Can request books directly

3.3 User Requirement Analysis

This section describes how the users interact with the system. Users of this web application can do the following.

User

- Create an account
- Adjust playback speed of an audiobook
- Control audiobook playback to move position backward and forward
- Comment on and review an audiobook
- Give feedback to volunteers
- Search for books by typing or voice command
- Select books from recommended lists
- Select books from categories
- Request new books that are not yet available
- Change user interface to color blindness mode

Administrator

- Check user the disability ID card that users must use to register
- Add new users

3.4 System Design

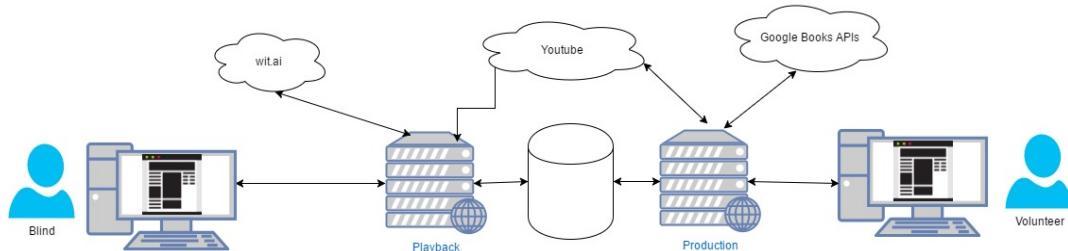


Figure 3.1: The System Design of Audiobook Production and Audiobook Playback

Blindary is a website that combines two services together, which are audiobook production and audiobook playback. Both audiobook production and audiobook playback use the same database to store data, but audiobook production and audiobook playback have different target users. Audiobook production provides audiobooks for blind users while audiobook playback provides services for the blind users. So, audiobook production and audiobook playback were separated to make each website easy to maintain. In audiobook playback, the blind users access the website via the Internet. When a user searches for audiobook to listen to, the system gets a list of books for the user. After the user selects the book, the system gets the link stored in the database and plays the audio from a specified Youtube link.

Blind users have two ways to search for audiobooks in our website, which are by typing or speaking. Audiobook playback uses Wit Speech API from Wit.ai to capture the speech of the user and transform it into text. Then Wit.ai is used to get

keywords from the text. After that, the website responds to the input. The audioplay playback also uses Youtube IFrame Player API to make the audiobook player for the blind hide the Youtube link and video.

3.4.1 Sequential Diagram

3.4.1.1 Feedback Phase of the Application

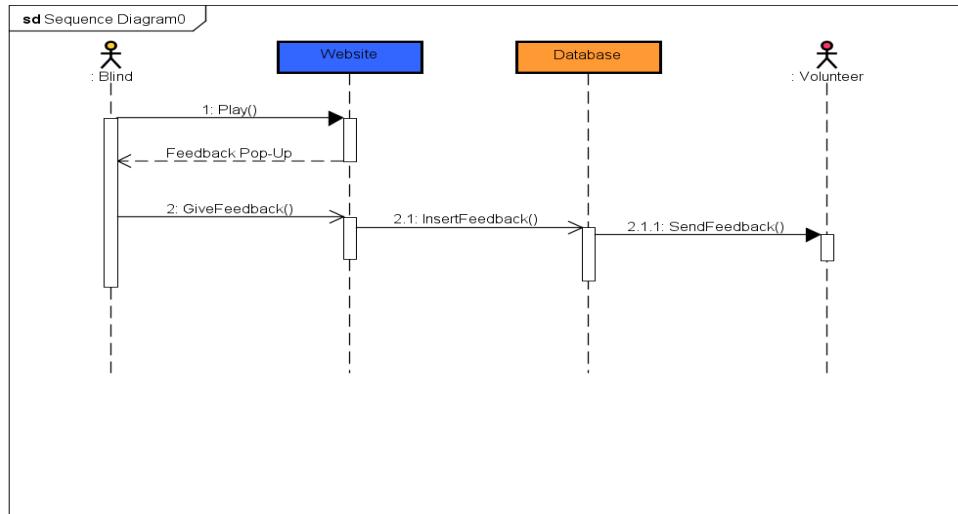


Figure 3.2: Feedback Phase Sequential Diagram

Figure 3.2 shows how a blind user gives feedback to volunteers about an audiobook that they have read. After the blind user has listened to the audiobook, he/she receives a form from the website for giving feedback to volunteers. However, giving feedback is optional for users. The user can either give feedback or ignore the form. If they give feedback, the feedback details are stored in the database, and the audiobook production website lets volunteers know if they got feedback by sending a notification to volunteers.

3.4.2 Use-Case Diagram

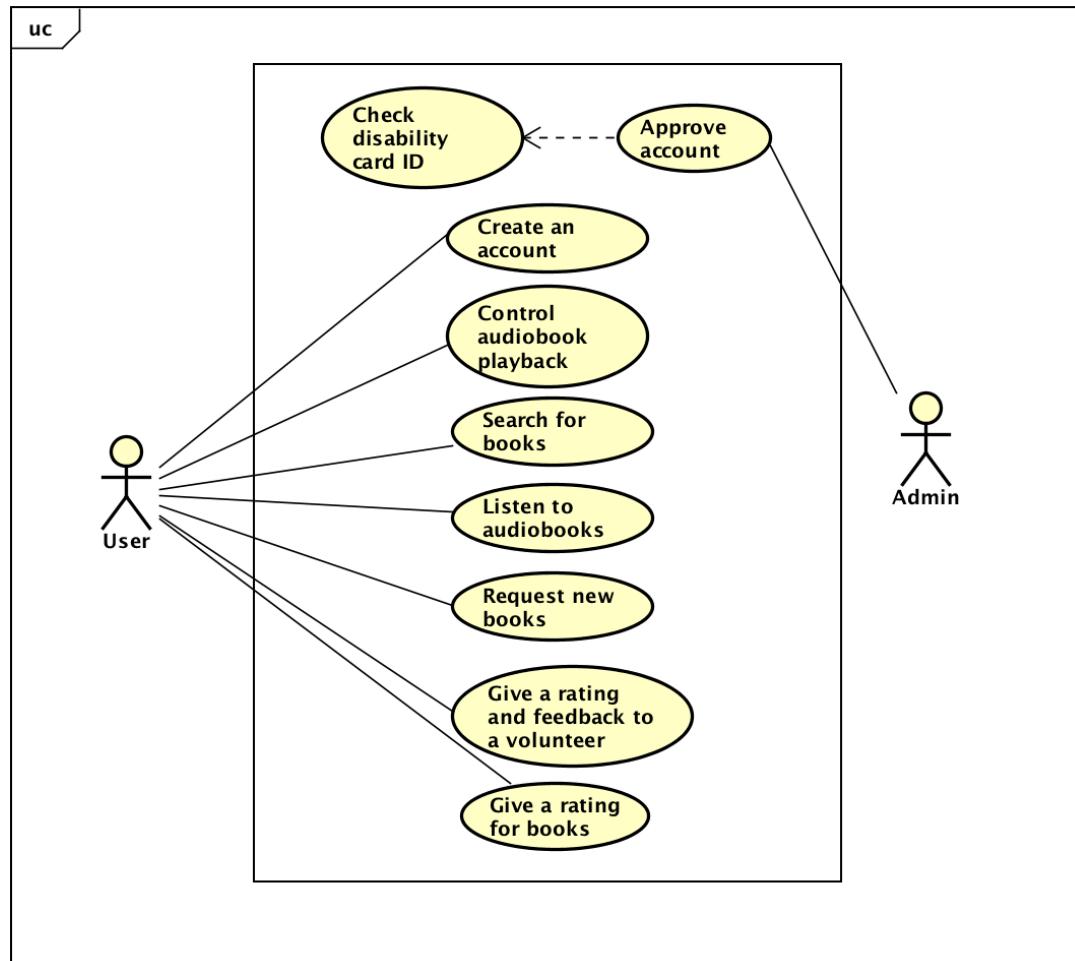


Figure 3.3: The Use-Case Diagram of Blindary from the Playback Side

Figure 3.3 shows the ways how blind users and administrators can interact with the website. First, users have to register by using a disability ID card and filling in some personal information to create an account. The administrator checks the blind person's personal information and gives the user ability to access to the website. Users can control an audiobook by themselves. They can search for a book by typing or speaking keywords at the search page. They can request books not already on the website or give a rating and feedback to volunteers, such as if they want any improvements or if it is good enough. Moreover, users can give a rating to each book that they have listened to.

3.4.3 Entity Relationship Diagram (ER diagram)

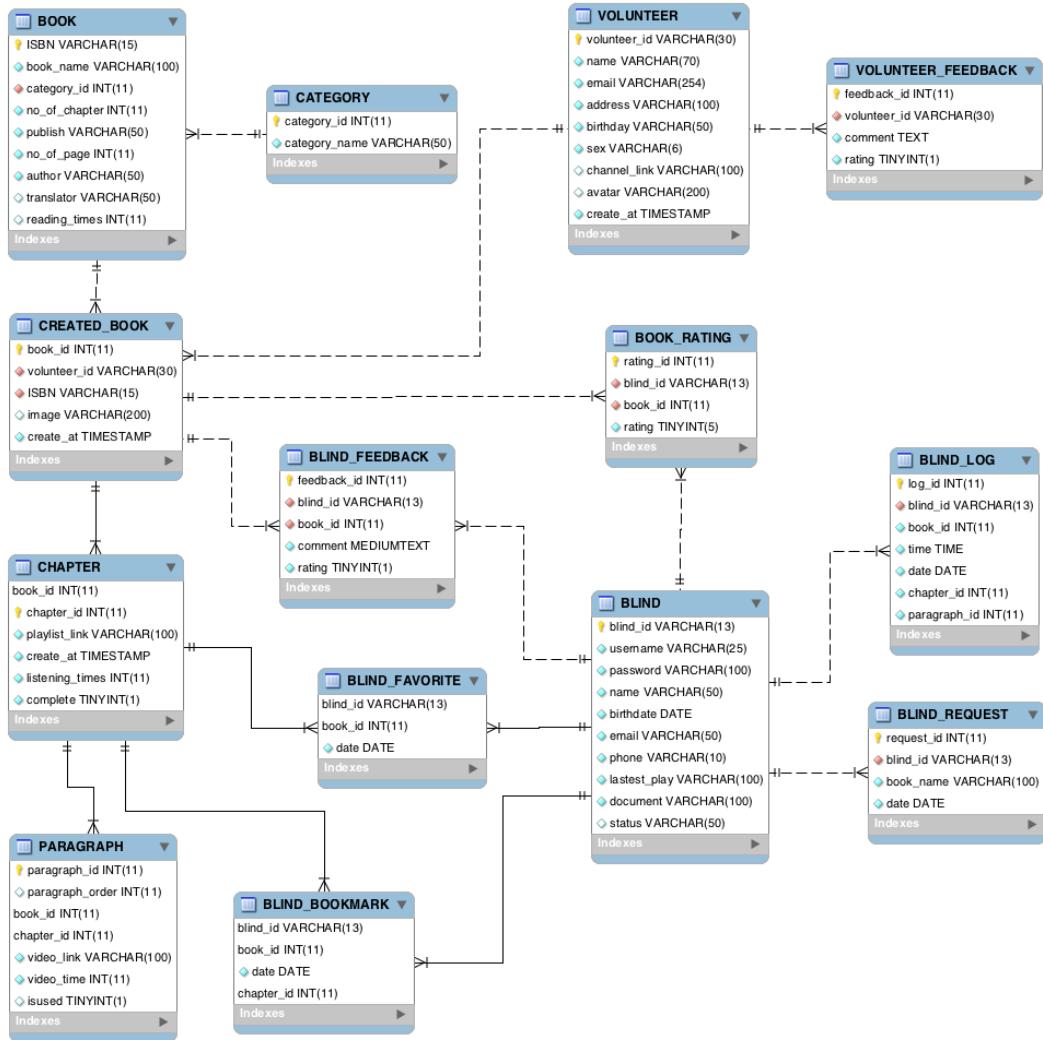


Figure 3.4: The ER Diagram of Blinary

Figure 3.4 shows the database of Blinary for both the audiobook playback and audiobook production. However, our group focused on the playback tables that are shown in figure 3.6 below.

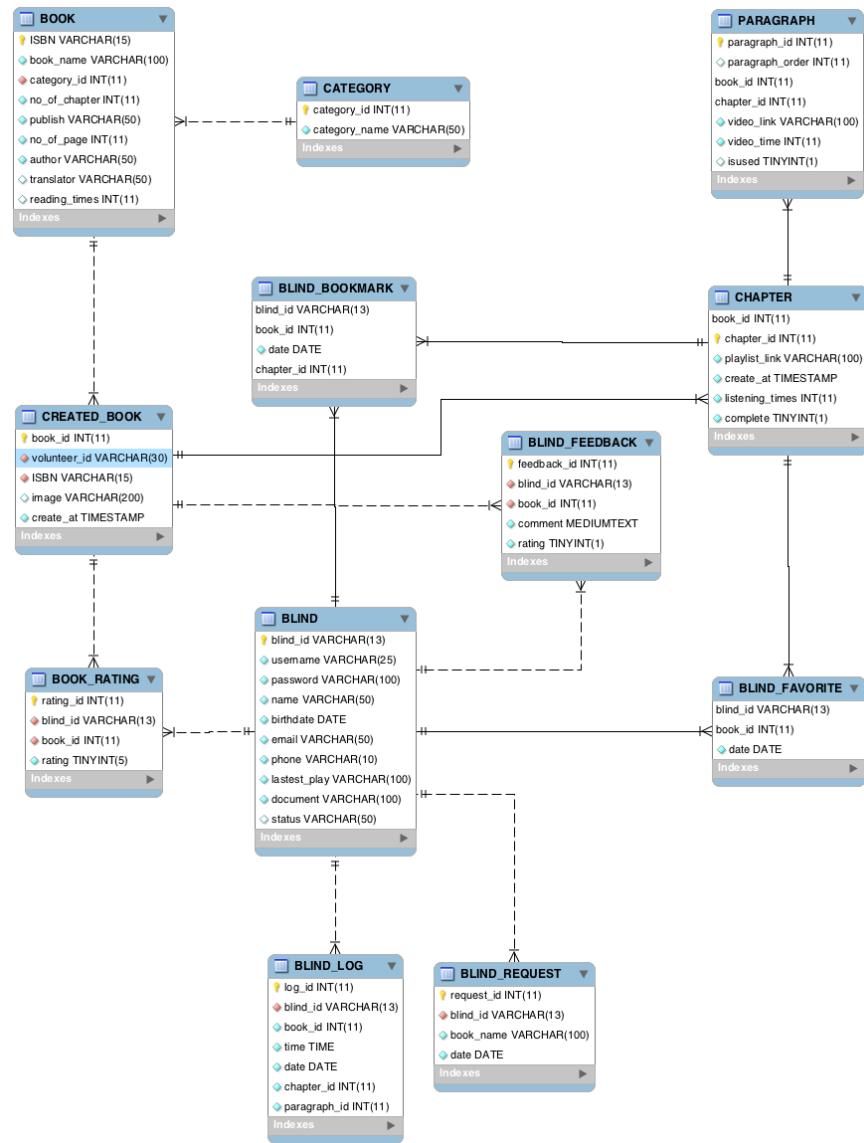


Figure 3.5: The ER Diagram of the Playback Side

Figure 3.5 shows the tables of Blinary on the playback side. All user information is stored in the **BLIND** table. This contains each username and password for logging into the system. What each user reads are stored in the **BLIND_LOG** table. This table is used to bookmark a chapter that a user wants and is used to mark books as favorites for later listening. It stores requests for books that are not in the system. Moreover, the blind who listen to an audiobook can give feedback to volunteers who produce the audiobooks.

3.4.4 Data Dictionary of System

A data dictionary is a description of the data in database and covers each table. It can help people to understand more about what data is kept in each table.

Table 3.2: BLIND Table

Field name	Description	Data type	Data length	Key
blind_id	Disability ID	varchar	13	PK
username	Username for logging into the system	varchar	25	
password	password	varchar	100	
name	Name of user	varchar	50	
birthdate	User's birthdate	date		
email	User's email	varchar	50	
phone	User's phone number	varchar	10	
lastest_play	Link to the last audio that a user listened to before closing the website	varchar	100	
document	Directory of each user's identification document	varchar	100	
status	Status of a user e.g. approved, not approved, pending	varchar	50	

Table 3.3: BLIND_LOG Table

Field name	Description	Data type	Data length	Key
log_id	Log ID	integer	11	PK
blind_id	Disability ID	varchar	13	FK
book_id	ISBN or ID of an audiobook	varchar	11	
date	Date that a user listened to an audiobook	date		
chapter_id	Chapter that a user listened to	int		
paragraph_id	Paragraph that a user listened to	int		

Table 3.4: BLIND_BOOKMARK Table

Field name	Description	Data type	Data length	Key
book_id	ISBN or ID of an audiobook	integer	11	PK
blind_id	Disability ID	varchar	13	FK
chptr_id	Chapter that a user listened to	varchar	10	
date	Date that a user bookmarked an audiobook	timestamp		

Table 3.5: BLIND_FAVORITE Table

Field name	Description	Data type	Data length	Key
book_id	ISBN or ID of an audiobook	integer	11	PK
blind_id	Disability ID	varchar	13	FK
date	Date that a user favorited an audiobook	timestamp		

Table 3.6: BLIND_REQUEST Table

Field name	Description	Data type	Data length	Key
request_id	Request ID	integer	11	PK
blind_id	Disability ID	varchar	13	FK
book_name	Name of a requested book	varchar	100	
date	Date requested	date		

Table 3.7: BLIND_RATING Table

Field name	Description	Data type	Data length	Key
rating_id	Rating ID	integer	11	PK
blind_id	Disability ID	varchar	13	FK
book_id	ISBN or ID of an audiobook	integer	11	FK
rating	Rating of a book	tinyint	5	

Table 3.8: BLIND_FEEDBACK Table

Field name	Description	Data type	Data length	Key
feedback_id	Feedback ID	integer	11	PK
blind_id	Disability ID	varchar	13	FK
book_id	ISBN or ID of an audiobook	integer	11	FK
comment	Comment to a volunteer	midiumtext		
rating	Rating that a user gave to an audiobook	tinyint	5	

Table 3.9: CHAPTER Table

Field name	Description	Data type	Data length	Key
book_id	ISBN or ID of an audiobook	integer	11	PK
chapter_id	ID of a chapter	integer	11	FK
playlist_link	Link of a chapter playlist	varchar	100	FK
create_at	Time that a chapter was created	timestamp		
listening_times	Time(s) that it was listened to	integer	11	
complete	Status of the chapter (completed or not complete)	tinyint	1	

Table 3.10: PARAGRAPH Table

Field name	Description	Data type	Data length	Key
paragraph_id	ID of a paragraph	integer	11	PK
paragraph_order	Second ID of a paragraph	integer	11	FK
book_id	ISBN or ID of audiobook	integer	11	FK
chapter_id	Chapter ID that a paragraph came from	integer	11	
video_link	Link to the paragraph	varchar	100	
video_time	Time of this video	integer	11	
isused	Status of the paragraph	tinyint	1	

3.4.5 User Interface

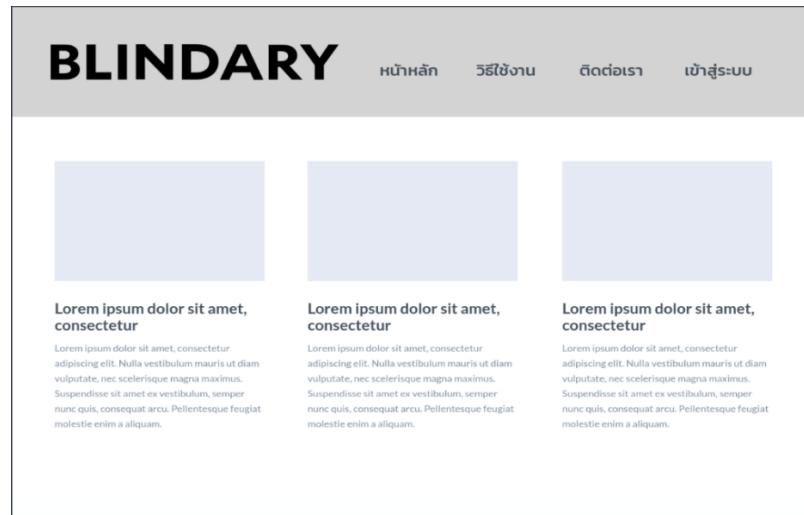


Figure 3.6: Home Page

Figure 3.6 shows the first page seen when a user opens the website. It contains news and announcements from the website and related information for the blind. Users can log into the website by clicking on “เข้าสู่ระบบ” button.



Figure 3.7: Log In Page

Figure 3.7 shows the log in page. If a user forgets his/her password, the user can click on “ลืมรหัสผ่าน” button to request to a new password or on Contact Us for Help. If person is not a member yet, the user can register by clicking on “สมัครสมาชิก” button.

The screenshot shows the registration page for the website 'BLINDARY'. At the top, there is a navigation bar with links: 'หน้าหลัก' (Home), 'วิธีใช้งาน' (How to use), 'ติดต่อเรา' (Contact us), and 'เข้าสู่ระบบ' (Log in). The main form is titled 'ลงทะเบียน' (Register) in bold. It contains several input fields: 'ชื่อจริง' (Real name), 'นามสกุล' (Surname), 'วัน/เดือน/ปีเกิด' (Birth date), 'เลขบัตรประจำตัวคนพิการ' (ID card number), 'อีเมลล์' (Email), 'เบอร์ที่สามารถติดต่อได้' (Phone number), 'ชื่อผู้ใช้' (User name), 'รหัสผ่าน' (Password), 'ยืนยันรหัสผ่าน' (Confirm password), and a file upload field 'เอกสารยืนยันตัวตน' (Identification documents) with a 'Browse' button. Below the form is a blue decorative bar.

Figure 3.8: Registration Page

Figure 3.8 shows the registration page. At this step, the blind may ask another person to register for them if they cannot register by themselves. The user has to fill in the form and upload documents that are necessary to identify himself/herself.

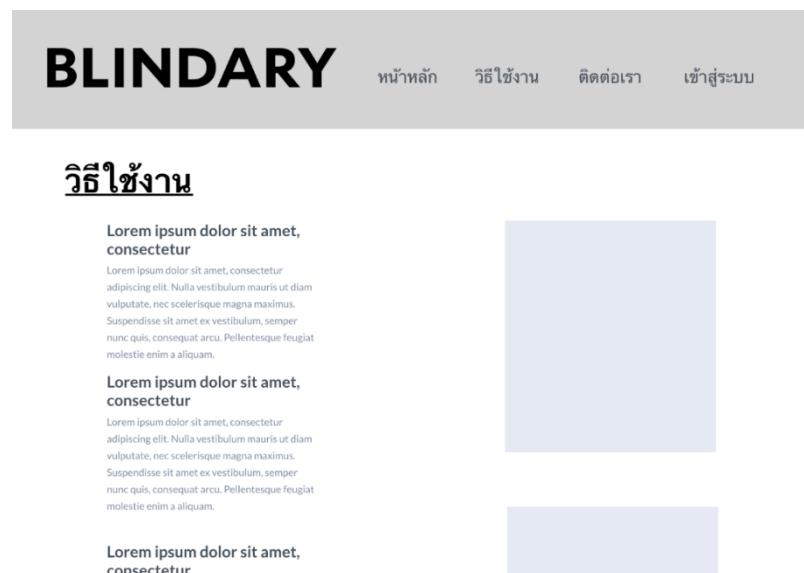


Figure 3.9: Instruction Page

Figure 3.9 shows the instruction page. For people who might not be familiar with using a website, it provides instructions of how to use the website. Clicking “วิธีใช้งาน” will make it easier to use the website.

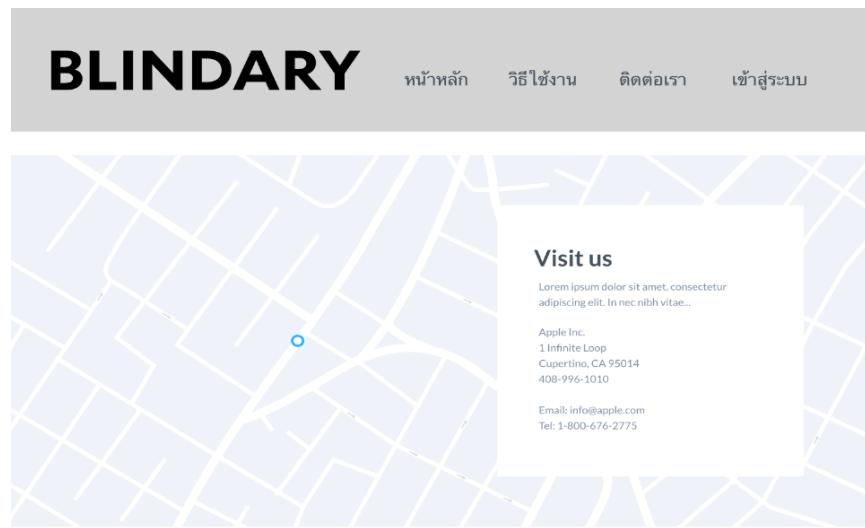


Figure 3.10: Contact Us Page

Figure 3.10 shows the contact us page. Users can contact the administrator if any problems occur or if the user wants to know further information.

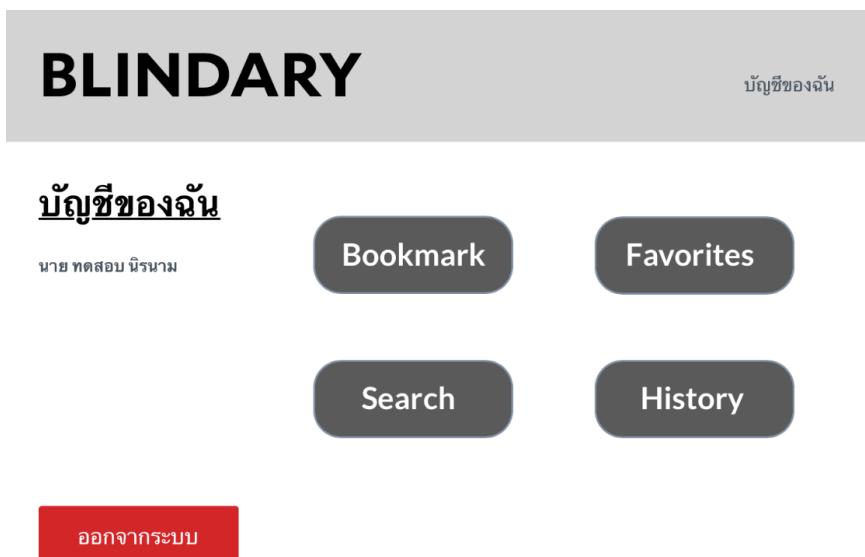


Figure 3.11: Profile Page

Figure 3.11 shows the profile page of a user. After users log into the website, it takes users to this page. It contains the name of the user, and five buttons which are bookmark, favorites, search, history and log out.

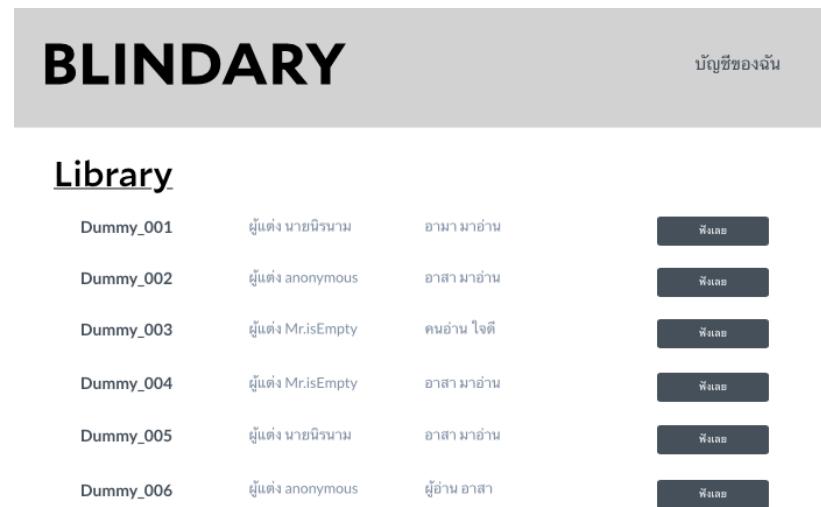


Figure 3.12: Library Page

Figure 3.12 shows the list of audiobooks that a user can find by using the search function or choosing the view all audiobooks function.



Figure 3.13: Bookmark Page

Figure 3.13 shows the bookmark page where users can bookmark audiobooks that they want to listen to later.

Dummy_001	ผู้แต่ง นายนิรนาม	อาสา มาอ่าน	<button>เพิ่มลง</button>
Dummy_003	ผู้แต่ง Mr.isEmpty	ผู้อ่าน ใจดี	<button>เพิ่มลง</button>
Dummy_004	ผู้แต่ง Mr.isEmpty	อาสา มาอ่าน	<button>เพิ่มลง</button>
Dummy_006	ผู้แต่ง anonymous	อาสา มาอ่าน	<button>เพิ่มลง</button>

Figure 3.14: Favorite page

Figure 3.14 shows the favorites page. Users can add audiobooks that they like to the favorites list. By using favorites, users can listen to audiobooks that they like more easily.

Dummy_003	ผู้แต่ง Mr.isEmpty	อาสา มาอ่าน	<button>เพิ่มลง</button>
Dummy_004	ผู้แต่ง Mr.isEmpty	อาสา มาอ่าน	<button>เพิ่มลง</button>
Dummy_005	ผู้แต่ง นายนิรนาม	ผู้อ่าน ใจดี	<button>เพิ่มลง</button>
Dummy_001	ผู้แต่ง นายนิรนาม	อาสา มาอ่าน	<button>เพิ่มลง</button>
Dummy_006	ผู้แต่ง anonymous	ผู้อ่าน อาสา	<button>เพิ่มลง</button>
Dummy_002	ผู้แต่ง anonymous	ผู้อ่าน อาสา	<button>เพิ่มลง</button>

Figure 3.15: History Page

Figure 3.15 shows the history page. The website keeps a list of audiobooks that a user has listened to. Also, users can delete the history list by clicking the Clear History button.

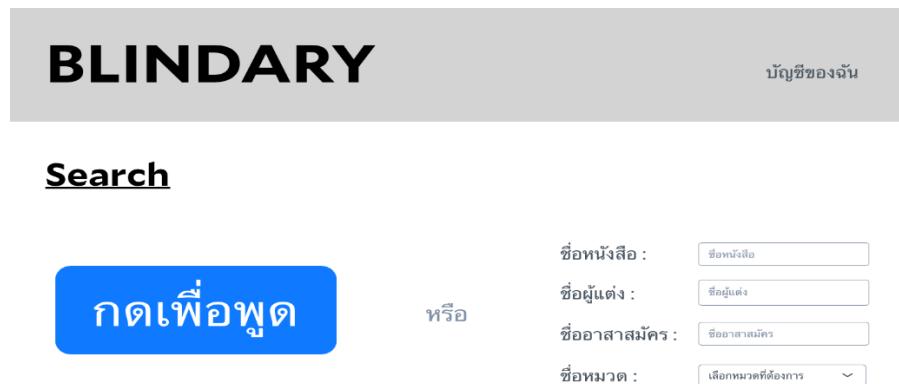


Figure 3.16: Search Page

Figure 3.16 shows the search page. Users can choose how they want to search for audiobooks. Users can tell the bot to help them or they can type in the details of an audiobook.



Figure 3.17: Audiobook Player Page

Figure 3.17 shows the audiobook player page. After users click the ฟังเลย button, it takes users to this page. On this page, users can select audiobooks by pressing the buttons. Also, they can set the playback speed of audiobooks to be slower or faster than normal. The player control buttons are arranged in a pattern that has the same size of buttons and the same amount of space between buttons. So, blind users can use the website more easily. Moreover, on devices that have a touch screen like smartphones and tablets, users can drag their finger around and listen to a voice over.

CHAPTER 4

SYSTEM FUNCTIONALITY

4.1 Introduction

This chapter describes the main functions and test plan of the system. First, the main functions section describes how the user interacts with the website. Next, the test plan of the project section consists of the description of each test case and its results.

4.2 Main Functions

Table 4.1: User and Administrator Main Functions

User Type	Functions
User	Register for an account on the Blidary website Log into the Blidary website View all audiobooks View the history of audiobooks previously listened to Play an audiobook Select audiobook chapters Select audiobook paragraphs Bookmark an audiobook Favorite an audiobook Give a rating for an audiobook Give feedback to volunteers Search for an audiobook by using voice command Search for an audiobook by typing Adjust the audiobook playback speed Request a new book Share an audiobook to Facebook Share an audiobook to Twitter
Administrator	Log in as an administrator of the Blidary website Approve a user account View user information and documents

4.2.1 Registration Page

Figure 4.1: Registration Page

Figure 4.1 shows the registration page where users have to fill all textfields to register and then upload a file to the website to prove that the user is blind, such as an image of their disability ID card. After the user clicks the “ลงทะเบียน” button, the website gives them a reply message such as shown below in figure 4.2.



Figure 4.2: Registration Response Message

Figure 4.2 shows the response message after registration.

4.2.2 Log In Page

BLINDARY หน้าแรก วิธีการใช้งาน ติดต่อเรา เข้าสู่ระบบ

Figure 4.3: Log In Page

Figure 4.3 shows the log in page where the system requires input of a correct username and password to log into the website.

4.2.3 Library Page

BLINDARY ห้องสมุด บัญชีของร้าน ตัวหนาหนาแน่นสือ วิธีการใช้งาน ออกจากรอบ

ห้องสมุด

Show 10 entries

ชื่อเรื่อง	ผู้แต่ง	ผู้อ่าน	Rating	
A Beautiful Mind	Sylvia Nasar	Natcha Yensoung	0.0	เลือกตอน
Harry Potter and the Deathly Hallows (Book 7)	Rowling, J.K.	Aloha poppo	0.0	เลือกตอน
Harry Potter og de vises sten	J k	Aloha poppo	0.0	เลือกตอน
Nemo	Someone	ggiftgy nun	5.0	เลือกตอน
The Fellowship of the Ring	John Ronald Reuel Tolkien	Aloha poppo	4.0	เลือกตอน
The Ivory Tower and Harry Potter	Lana A. Whited	Salisa Cct	0.0	เลือกตอน
กลุ่มที่นักฟันธงชื่น ลิลเดอร์	กิตติ ใจที่พัฒนาขึ้น	ggiftgy nun	0.0	เลือกตอน
กลุ่มที่นักฟันธงชื่น ลิลเดอร์	กิตติ ใจที่พัฒนาขึ้น	Salisa Cct	0.0	เลือกตอน
กินดองผู้อ่านไปให้ก่อนหน้าตลอดกาล สไตล์หนอนอินยัง	ลิลเดอร์	Salisa Cct	0.0	เลือกตอน
เขียนการเด็ก ชุด นิทานจากเพื่อนศรี	ตอบรัก	Aloha poppo	4.5	เลือกตอน

Previous 1 2 3 Next

Figure 4.4: Library Page

Figure 4.4 shows the library page where users can view a list of audiobooks. The user can limit the number of audiobooks shown on each page, and the user can sort the audiobooks by clicking the table header.

4.2.4 History Page

The screenshot shows a table titled "ประวัติการฟัง" (History of Listening) with columns for "ชื่อเรื่อง" (Title), "ผู้แต่ง" (Author), and "วันที่ฟัง" (Date). The table lists 20 entries, each corresponding to a book from the "The Country of the Blind" series by H.G. Wells, with details like "Nemo เล่ม 1 ยองหน้าที่ 1" and "H.G. Wells" as the author.

ชื่อเรื่อง	ผู้แต่ง	วันที่ฟัง
Nemo เล่ม 1 ยองหน้าที่ 1	Someone	2017-11-13 14:59:04 ฟังเสียง
มนุษย์การเด็ก สูตร นิตยานุญาตที่มนุษย์ ตอนที่ 1 ยองหน้าที่ 1	ออกล็อก	2017-11-13 12:21:19 ฟังเสียง
มนุษย์การเด็ก สูตร นิตยานุญาตที่มนุษย์ ตอนที่ 1 ยองหน้าที่ 3	ออกล็อก	2017-11-13 11:58:35 ฟังเสียง
มนุษย์การเด็ก สูตร นิตยานุญาตที่มนุษย์ ตอนที่ 1 ยองหน้าที่ 2	ออกล็อก	2017-11-13 11:54:52 ฟังเสียง
มนุษย์การเด็ก สูตร นิตยานุญาตที่มนุษย์ ตอนที่ 1 ยองหน้าที่ 1	ออกล็อก	2017-11-13 11:53:12 ฟังเสียง
มนุษย์การเด็ก สูตร นิตยานุญาตที่มนุษย์ ตอนที่ 1 ยองหน้าที่ 3	ออกล็อก	2017-11-13 11:38:51 ฟังเสียง
มนุษย์การเด็ก สูตร นิตยานุญาตที่มนุษย์ ตอนที่ 1 ยองหน้าที่ 2	ออกล็อก	2017-11-13 11:37:07 ฟังเสียง
มนุษย์การเด็ก สูตร นิตยานุญาตที่มนุษย์ ตอนที่ 1 ยองหน้าที่ 1	ออกล็อก	2017-11-13 11:25:20 ฟังเสียง
มนุษย์การเด็ก สูตร นิตยานุญาตที่มนุษย์ ตอนที่ 1 ยองหน้าที่ 1	ออกล็อก	2017-11-13 11:24:59 ฟังเสียง
มนุษย์การเด็ก สูตร นิตยานุญาตที่มนุษย์ ตอนที่ 1 ยองหน้าที่ 1	ออกล็อก	2017-11-13 11:17:31 ฟังเสียง
ดินแดนคนตาบอด (The Country of the Blind) ตอนที่ 1 ยองหน้าที่ 3	นาย. จี. เวลลส์ (H. G. Wells.)	2017-11-13 10:19:32 ฟังเสียง
ดินแดนคนตาบอด (The Country of the Blind) ตอนที่ 1 ยองหน้าที่ 2	นาย. จี. เวลลส์ (H. G. Wells.)	2017-11-13 10:19:20 ฟังเสียง

Figure 4.5: History Page

Figure 4.5 shows the history page. After login, the website takes users to the “บัญชีของฉัน” page. The user has to click the “ประวัติการฟัง” button to visit the history page. On the history page, it shows the last 20 items that a user has listened to. Certain details are shown which are the book’s title, book’s author, and the date and time that the user listened to it. Moreover, the user can click the “ฟังเลย” button to listen to a book.

4.2.5 Search Page

The screenshot shows the search page with a search bar containing "ค้นหาหนังสือ". Below the search bar are four input fields: "ชื่อหนังสือ" (Book Title), "ชื่อผู้แต่ง" (Author), "ชื่อภาษาต่างประเทศ" (Foreign Language Title), and "ชื่อหมวด" (Category). A large microphone icon with the text "กดเพื่อพูด" (Press to speak) is positioned above the search bar. Below the microphone is a "พิมพ์" (Type) button. To the right of the microphone is a "ค้นหา" (Search) button.

Figure 4.6: Search Page

Figure 4.6 shows the search page where the user can search by typing or speaking. For speaking, the user has to click the “กดเพื่อพูด” button and then speak the desired words. When the user has finished speaking, the user has to click the “พูด” button. After this has been done, the system searches using keywords in the speech.

4.2.6 Audiobook Player Page

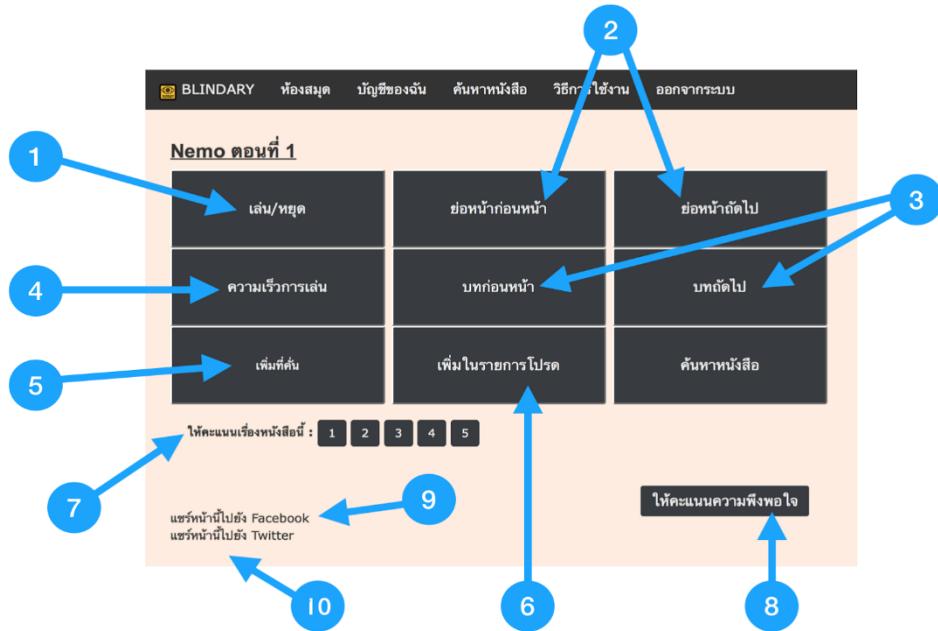


Figure 4.7: Audiobook Player Page

Figure 4.7 shows the audiobook player page. After the users clicks the “ฟังเลย” button on any page, the website takes the user to the audiobook player page. There are 10 main functions on this page:

1. Play or pause audio
2. Go to previous or go to next paragraph
3. Go to previous chapter or next chapter
4. Adjust the audiobook playback speed
5. Add or remove a chapter bookmark
6. Add or remove an audiobook favorite
7. Give a rating for the current audiobook
8. Give feedback to volunteer
9. Share the current chapter to Facebook
10. Share the current chapter to Twitter

4.2.7 Audiobook Request Page

Figure 4.8: Audiobook Request Page

Figure 4.8 shows the audiobook request page. After login, the website takes users to the “บัญชีของฉัน” page. The user has to click the “ส่งคำขอเพิ่ม” button to visit the audiobook request page. On the audiobook request page, the user can enter an ISBN number or book title to request an audiobook that is not in the website. After the user fills in an ISBN number or book title, the user has to click the “ส่งคำขอ” button.

4.2.8 Administrator Log In Page

The administrator can log into the website by using the same login page as the user(Figure 4.3), but after login, the website takes the administrator to the administrator page.

4.2.9 Administrator Page

Name	Username	Phone	Email	Status	Register Date	Document
เกส ภู	v	1213131313	d@ho.om	ปกติ	2017-09-24 17:57:59	ดูรายละเอียด
อุรุฉ รุ่ง	s	0100101010	s@s.com	รายการตรวจสอบ	2017-11-18 16:02:20	ดูรายละเอียด
พนักงาน ผู้管	www		thitirat.suntara@gmail.com	ปกติ	2017-10-28 17:29:58	ดูรายละเอียด
ธนาพีพัชร์ งาม	user	0988383647	ts@a.com	ปกติ	2017-10-13 22:33:32	ดูรายละเอียด
ดาวน์โหลด ใจเดียว	eiei	1213131313	dekirku.kana@a.com	รายการตรวจสอบ	2017-09-24 17:57:59	ดูรายละเอียด
ทดสอบ ทดสอบ	asdf			ปกติ	2017-09-24 17:57:59	ดูรายละเอียด
ทดสอบ ทดสอบ	tt	1111111111	mda@kf.cpm	รายการตรวจสอบ	2017-09-24 17:57:59	ดูรายละเอียด

Figure 4.9: Administrator Page

Figure 4.9 shows the administrator page. On this page, administrator can search for users by using the search text field. The administrator can view more details of each user by clicking the “ข้อมูลเพิ่มเติม” button.

4.2.10 Approval Page

The screenshot shows a user profile page. At the top, there is a navigation bar with icons for Home, สถานะปกติ (Normal Status), รายการตรวจสอบ (Checklist), and ออกจากระบบ (Logout). Below the navigation bar, there is a placeholder for a profile picture. To the right of the placeholder is a placeholder for an ID card labeled 'บัตรประจำตัวคนพิการ ID Card for PWD'.

ข้อมูลส่วนตัว

ชื่อ-นามสกุล : ชื่อจริง นามสกุลจริง
รหัสประจำตัวคนพิการ : 12112017
วันเดือนปีเกิด : 16/01/80
Email : blind@blind.com
Username : blinduser
Status :

Figure 4.10: Approval Page

Figure 4.10 shows the approval page where the administrator checks a person's details before approving the person to use the website.

4.3 Test Plan and Test Results

Table 4.2: Test Plan and Test Results

Function	Test Case	Test Flow	Expected Output	Actual Output	Result
Login	User enters both a correct username and password	User entered both a username and password correctly	Takes user to member page	Took user to member page	Passed
	User leaves username field blank	User left the username field blank	Prompts user to enter username	Prompted user to enter username	Passed
	User enters an incorrect username or password	User entered an incorrect username or password	Prompts user to try again	Prompted user to try again	Passed
Register	User enters an available disability number	User entered an available disability number	Shows user that user can use this number	Showed user that user can use this number	Passed

Table 4.2: Test Plan and Test Results (cont.)

Function	Test Case	Test Flow	Expected Output	Actual Output	Result
Register	User enters a disability number that was already used	User entered a disability number that was already used	Shows user disability number was already used	Showed user disability number was already used	Passed
	User enters an available email	User entered the email correctly	Shows user can use the email	Showed user can use the email	Passed
	User enters an email that was already used	User entered an email that was already used	Shows the email was already used	Showed the email was already used	Passed
	User enters an available username	User entered the username correctly	Shows user can use this username	Showed user can use the username	Passed
	User enters a username that was already used	User entered a username that was already used	Shows the username was already used	Showed the username was already used	Passed
Bookmark	User clicks add to bookmark button	User clicked add this chapter to bookmarks on player page	Change text in button to be “ลบที่คั่น”	Changed text in button to be “ลบที่คั่น”	Passed
	User clicks remove from bookmark button	User clicked remove this chapter from bookmarks on player page	Change text in button to be “เพิ่มที่คั่น”	Changed text in button to be “เพิ่มที่คั่น”	Passed
Favorite	User clicks add to favorites	User clicked add this book to favorites	Change text in button to be “เพิ่มในรายการโปรด”	Changed text in button to be “เพิ่มในรายการโปรด”	Passed

Table 4.2: Test Plan and Test Results (cont.)

Function	Test Case	Test Flow	Expected Output	Actual Output	Result
Favorite	User clicks to remove from favorites	User clicked to remove this book from favorites	Change text in button to be “ลบจากรายการโปรด”	Changed text in button to be “ลบจากรายการโปรด”	Passed
Rate audiobook	User gives a rating to audiobook	User gave a rating to audiobook	Show text as “ให้คะแนนหนังสือแล้ว”	Showed text as “ให้คะแนนหนังสือแล้ว”	Passed
Search	User searches available audiobooks by typing	User entered text on search form	Lists the audiobook that matches the search result	Listed audiobook that matched the search result	Passed
	User searches for unavailable audiobooks by typing	User entered text on the search form	Nothing happens	Nothing happened	Passed
	User searches for an available audiobook by using voice command	User clicked “กดเพื่อพูด” and spoke a voice command	Lists the audiobook that matches the search value	Listed the audiobook that matched the search value	Passed
	User searches for an unavailable audiobook by using a voice command	User clicked “กดเพื่อพูด” and spoke a voice command	Nothing happens	Nothing happened	Passed
Book Request	User makes an ISBN request	User completed the ISBN field correctly	Shows user that the request was sent	Showed user that the request was sent	Passed

Table 4.2: Test Plans and Test Results (cont.)

Function	Test Case	Test Flow	Expected Output	Actual Output	Result
Book Request	User makes a request with an ISBN that was already requested	User completed an ISBN that was already requested	Shows user that this book is in process	Showed user that this book is in process	Passed
	User requests an invalid ISBN	User entered ISBN that does not match with Google Book API	Shows user that the website does not find this ISBN	Showed user that the website did not find this ISBN	Passed
	User makes a request by using a book title	User entered the book title field correctly	Shows user that the request was sent	Showed user that the request was sent	Passed
	User requests a book title that was already requested	User entered a book title that was already requested	Shows user that this book is in process	Showed user that this book is in process	Passed

CHAPTER 5

SUMMARY AND SUGGESTIONS

5.1 Introduction

This chapter summarizes all details of the project. First, the project summary describes the project briefly. Second, the problems that were encountered and their solutions are covered. Lastly, suggestions for further development of the Blindary project are given.

5.2 Project Summary

Blindary is a website that combines two services together which are audiobook production and audiobook playback. For blind users, the audiobook playback service published audiobooks that were created by the audiobook production service. The website was designed to support easy access. Using the search function, users have two ways to search for audiobooks in the website, which are by typing or speaking. The audiobook playback service uses Wit.ai API to capture the speech of the user and also makes the system understand the meaning of the user's speech.

5.3 Problems Encountered and Solutions

5.3.1 Wit.ai API

Wit.ai API supports the Thai language, but we had to train the NLP API to understand a given sentence by using many examples because Wit.ai API is not designed especially for use with the Thai language. So, we sent the search page to many people to get more patterns of sentences to train the NLP API.

5.3.2 DAISY Digital Talk Book

First, we tried to use DAISY as a player, but we found that DAISY API contained a lot of problems. After that, we found Youtube IFrame API which made creating the player easier than if we had used DAISY.

5.3.3 Audiobook Player

The audiobook player has to show the book title with the current chapter. The audiobook player page contains many functions and each function has to work properly whenever it is used. When we used PHP, the website seemed to be slow. So, we used JavaScript to call each function because we wanted the player to work without reloading the page, and we wanted it to update the chapter number without any mistakes.

5.3.4 Registration Page

If users use Safari as their browser, users can type alphabet characters in the birth date field on the registration page. This should be impossible. So, we had to add a new JavaScript function to validate this field before users can submit the form.

5.4 Suggestions for Further Development

5.4.1 Audiobook Player with Wit.ai

Developers should use Wit.ai in the audiobook player to help the user control the player more easily. Then the user could control it by using voice command.

5.4.2 Natural Language Processing

Developers could find another natural language processing service that supports the Thai language better and with more accuracy than Wit.ai

5.4.3 User Interface

Developers should run Lighthouse in Chrome DevTools when there is some change in the user interface. Developers could use the audits for the accessibility function and get a score that is generated by Lighthouse of more than 90. Each audit has a reference document that explains each response message and how to fix the user interface.

REFERENCES

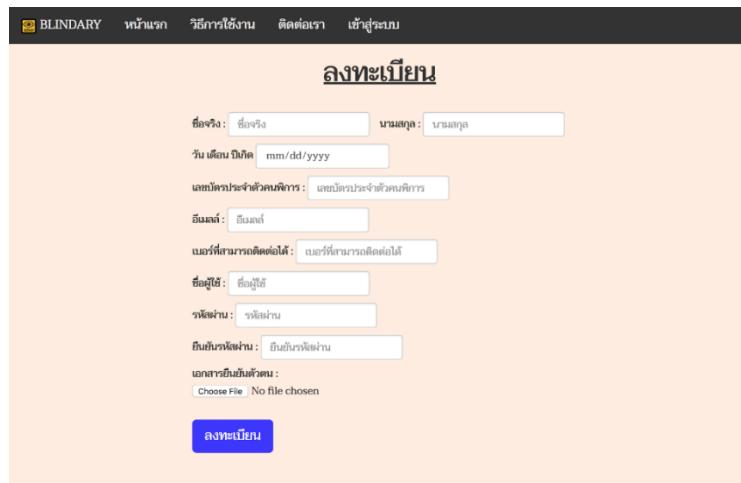
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APPENDIX

APPENDIX A

USER MANUAL

A.1 Registration Page



The screenshot shows the registration page for a Blinary account. The page has a dark header with the logo and navigation links: BLINDARY, หน้าแรก, วิธีการใช้งาน, ติดต่อเรา, เข้าสู่ระบบ. Below the header is a title "ลงทะเบียน" (Register). The form contains the following fields:

- ชื่อจริง :
- นามสกุล :
- วัน เดือน ปีเกิด
- เบอร์โทรศัพท์/อีเมล :
- อีเมล :
- บัญชีธนาคารที่ต้องการ :
- รหัสผ่าน :
- ยืนยันรหัสผ่าน :
- รูปบัตรประชาชน :

At the bottom is a blue "ลงทะเบียน" button.

Figure A.1: Registration Page

Figure A.1 shows the registration page which allows the user to register for a Blinary account by filling in all the required information and uploading their identification document. Then the user can click the “ลงทะเบียน” button to register.

A.2 Log In Page



The screenshot shows the log in page for the Blinary website. The page has a light blue header with the logo and navigation links: BLINDARY, หน้าแรก, วิธีการใช้งาน, ติดต่อเรา, เข้าสู่ระบบ. Below the header is a title "เข้าสู่ระบบ" (Log In). The form contains the following fields:

- ชื่อผู้ใช้ :
- รหัสผ่าน :

Below the fields is a link "ลืมรหัสผ่าน". At the bottom is a blue "เข้าสู่ระบบ" button.

At the very bottom of the page are two logos: KMUTT and SIT, followed by the text "คณบดีเทคโนโลยีสารสนเทศ มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าลาดบุรี".

Figure A.2: Log In Page

Figure A.2 shows the log in page where the user enters his/her username and password. Then the user clicks the “เข้าสู่ระบบ” button to log into the Blinary website.

A.3 Profile Page

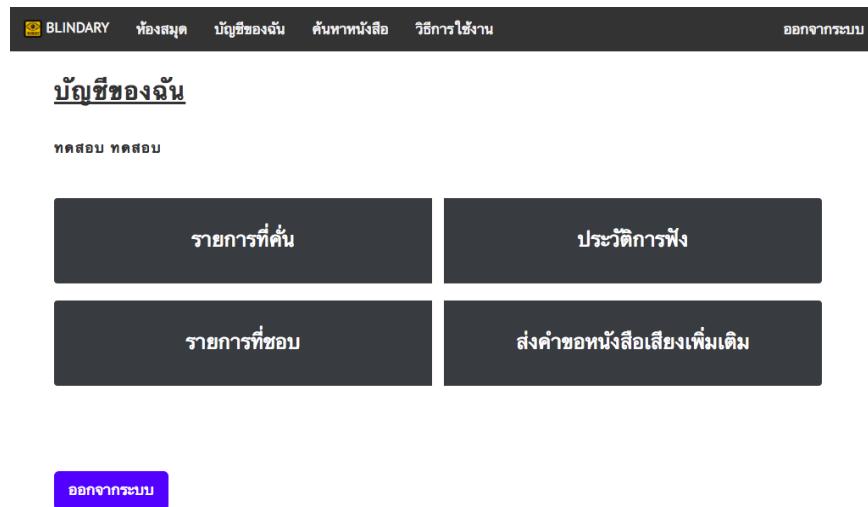


Figure A.3: Profile Page

Figure A.3 shows the profile page. After the user logs into the website, this page appears. On this page, there are four buttons that can take the user to other pages that the user might want to enter. These pages are the “รายการที่คั่น” page, “ประวัติการฟัง” page, “รายการที่ชอบ” page, and “ส่งคำขอหนังสือเสียงเพิ่มเติม” page.

A.4 Search Page

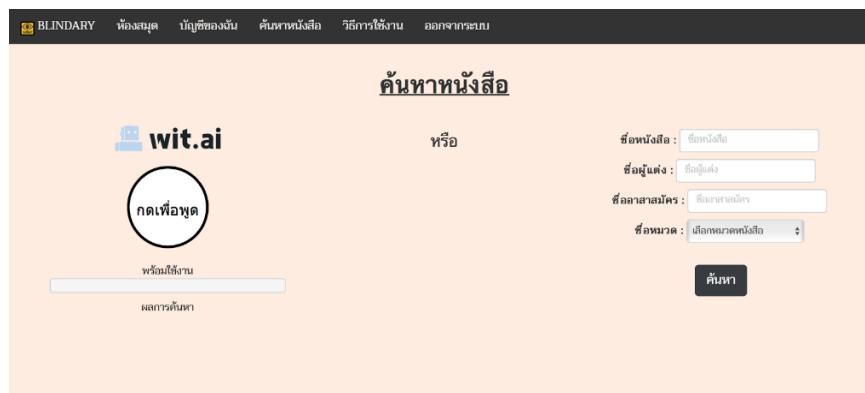


Figure A.4: Search Page

Figure A.4 shows the search page where the user can search for audiobooks in the Blidnary website. On this page, the user can press the “กดเพื่อคุ้ด” button to search for an audiobook by using voice or completeing search fields to search manually.

A.5 Library Page

The screenshot shows a library page with a header containing links for BLINDARY, ห้องสมุด, บัญชีของฉัน, ค้นหาหนังสือ, วิธีการใช้งาน, and ออกจากระบบ. Below the header is a table titled "ห้องสมุด" (Library) with the following data:

ชื่อเรื่อง	ผู้แต่ง	ผู้อ่าน	Rating	
A Beautiful Mind	Sylvia Nasar	Natcha Yensoung	0.0	เลือกตอน
Harry Potter and the Deathly Hallows (Book 7)	Rowling, J.K.	Aloha poppo	0.0	เลือกตอน
Harry Potter og de vises sten	J k	Aloha poppo	0.0	เลือกตอน
Nemo	Someone	ggiftgy nun	5.0	เลือกตอน
The Fellowship of the Ring	John Ronald Reuel Tolkien	Aloha poppo	4.0	เลือกตอน
The Ivory Tower and Harry Potter	Lana A. Whited	Salisa Cct	0.0	เลือกตอน
กลยุทธ์นักฟังเสียง อีมเมลเวอร์	กิกตี้ ใจดีเพชรรัตน์	ggiftgy nun	0.0	เลือกตอน
กลยุทธ์นักฟังเสียง อีมเมลเวอร์	กิกตี้ ใจดีเพชรรัตน์	Salisa Cct	0.0	เลือกตอน
กินอยู่อย่างไรให้อ่อนนุ่มตลอดกาล สไตล์แม่ชินยะ	ธีรภัณ ชินยะ	Salisa Cct	0.0	เลือกตอน
ชนะการเด็ก ชุด นิทานจากเพื่อนสัตว์	ต่องก๊อก	Aloha poppo	4.5	เลือกตอน

At the bottom right, there are navigation buttons: Previous, 1, 2, 3, Next.

Figure A.5: Library Page

Figure A.5 shows the library page which displays all audiobooks in the Blindary website, and the user can click the “เลือกตอน” button to select chapters of a book.

A.6 Chapter Page

The screenshot shows a chapter page with a header containing links for BLINDARY, ห้องสมุด, บัญชีของฉัน, ค้นหาหนังสือ, วิธีการใช้งาน, and ออกจากระบบ. Below the header is a table titled "Chapter(s)" with the following data:

ชื่อเรื่อง	ผู้แต่ง
ถังไห่จงมหาราช ตอนที่ 1	เล่า ชวน หัว
ถังไห่จงมหาราช ตอนที่ 2	เล่า ชวน หัว
ถังไห่จงมหาราช ตอนที่ 3	เล่า ชวน หัว
ถังไห่จงมหาราช ตอนที่ 4	เล่า ชวน หัว
ถังไห่จงมหาราช ตอนที่ 5	เล่า ชวน หัว

Figure A.6: Chapter Page

Figure A.6 shows the chapter page which displays all chapters in each audiobook. The user can select chapters by clicking the “ฟังเลย” button.

A.7 Audiobook Player Page



Figure A.7: Audiobook Player Page

Figure A.7 shows the audiobook player page where the user can listen to audiobooks. The users can play or pause an audiobook by clicking the “เล่น/หยุด” button. The user can go back to the previous paragraph by clicking the “ย่อหน้าก่อนหน้า” button or go to the next paragraph by clicking the “ย่อหน้าถัดไป” button. The user can adjust the audio playback speed by clicking the “ความเร็วการเล่น” button. The user can choose one of the four speeds which are 0.75x, 1.0x, 1.5x and 2x. The user can go back to the previous chapter by clicking the “บทก่อนหน้า” button or go to next chapter by clicking the “บทถัดไป” button. The user can add the current chapter to bookmarks by clicking the “เพิ่มที่คั่น” button. The user can add the audiobook to favorites by clicking the “เพิ่มในรายการโปรด” button. The user can go to the search page by clicking the “ค้นหาหนังสือ” button. Moreover, the user can rate the current audiobook by clicking a rating number button. The user can give feedback to the volunteer who created the current audiobook by clicking the “ให้คะแนนความพึงพอใจ” button. The user can also share the current audiobook by clicking the “แชร์หน้านี้ไปยัง Facebook” button or the “แชร์หน้านี้ไปยัง Twitter” button.



**King Mongkut's University of Technology Thonburi
Agreement on Intellectual Property Rights Transfer for
Undergraduate Students**

Date 6th Dec 2017

Name Mister Chayut Surname Upatham

Student Number 57130500227

Home Address 23/125 Bampisan, Thung-khu, Thung-khou

Postal Code 10140 City Bangkok Phone 087-4136913 and

Name Miss Jirattikarn Surname Sasithorn

Student Number 57130500225

Home Address 1/29 Rangsit-Nakornnayok Road, Phachathiphat, Thanyaburi

Postal Code 12130 City Phatumthani Phone 094-5718396 and

Name Miss Thitrat Surname Suntarapornpol

Student Number 57130500230

Home Address 100/488 Soi Kumkla 7, Lamplatiew, Ladkrabang

Postal Code 10520 City Bangkok Phone 083-0094738

We, the students of the School of Information Technology, King Mongkut's University of Technology Thonburi in the Bachelor of Science in Computer Science (English programme).

We, as 'Transferer', hereby transfer the ownership of our project copyright to King Mongkut's University of Technology Thonburi who has appointed Assoc. Prof. Nipon Charoenkitkarn, Ph.D. Dean of the School of Information Technology to be 'Transferee' of copyright ownership under the 'Agreement' as follows.

1. We are the authors of the project entitled Blindary (Wit.ai)

.....
under the supervision of Asst. Prof. Chonlameeth Aspnikanondt, Ph.D.
who is our supervisor, and/or Mister Suthat Ronglong

who is/are my co-supervisor(s), in accordance with the Thai Copyright Act B.E. 2537. The project is a part of the curriculum of KMUTT.

2. We hereby transfer the copyright ownership of all our work in the project to KMUTT throughout the copyright protection period in accordance with the Thai Copyright Act B.E. 2537, effective on the approval date of project proposal consented by KMUTT.

3. To have the project distributed in any form of media, we shall in each and every case stipulate the project as the work of KMUTT.

4. For our own distribution of project or reproduction, adjustment, or distribution of project by a third party in accordance with the Thai Copyright Act B.E. 2537 with remuneration in return, we are subject to obtain a prior written permission from KMUTT.

5. To use any information from our project to make an invention or create any intellectual property works within ten (10) years from the date of signing this Agreement, we are subject to obtain prior written permission from KMUTT, and KMUTT is entitled to have intellectual property rights on such inventions or intellectual property works, including entitling to take royalty from licensing together with the distribution of any benefit deriving partly or wholly from the works in the future, conforming with the Regulation of King Mongkut's University of Technology Thonburi Re the Administration of Benefits deriving from Intellectual Property B.E. 2538.

6. If the benefits arise from our project or our intellectual property works owned by KMUTT, we shall be entitled to gain the benefits according to the allocation rate stated in the Regulation of King Mongkut's University of Technology Thonburi Re the Administration of Benefits deriving from Intellectual Property B.E. 2538.

Signature *Chayut U* Transferor Signature.....*T* Transferee
(*Mr. Chayut Upatham*) (Assoc.Prof. Nipon Charoenkitkarn, Ph.D.)
Student Dean

Signature *Jirattikarn* Transferor Signature.....*Thirada Yuk* Witness
(*Miss.Jirattikarn Sasithorn*) (Mrs. Thirada Yuktanan)
Student

Signature *Thitirat Suntarapom* Transferor Signature.....*Rapeeporn* Witness
(*Ms.Thitirat Suntarapom*) (Miss Rapeeporn Phattaratummaruk)
Student