

PROJECT No. ISNE P703-2/2565

Physical Therapy Clinic Service Platform

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for the Degree of Bachelor of Engineering
Department of Computer Engineering
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เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาวิศวกรรมศาสตรบัณฑิต

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บทคัดย่อ

โครงการพัฒนาแพลตฟอร์มที่ช่วยให้คลินิกกายภาพบำบัดและลูกค้าของพวกเขาด้วยการทำให้กระบวนการนัดหมายง่ายขึ้นและมีประสิทธิภาพมากขึ้น ลูกค้าสามารถใช้แอปพลิเคชันเพื่อหาคลินิก จองนัดหมาย และดูราคาได้ ทางฝั่งระบบของคลินิกสามารถจัดตารางวันเวลาที่รับดูแล รวมถึงดูจำนวนลูกค้าที่จะเข้ามาใช้บริการในแต่ละวันได้ และยังช่วยให้คลินิกสามารถปรับปรุงการดำเนินงานได้โดยการเก็บทุกอย่างไว้ในที่เดียวกัน

โดยสร้างแพลตฟอร์มเป็นเว็บแอปพลิเคชันด้วย Next.js ซึ่งเป็นเฟรมเวิร์กการพัฒนาที่ทันสมัย มี SEO (Search engine optimization) ที่ดีขึ้น และมีการเรนเดอร์แบบเซิร์ฟเวอร์ฝั่งของเว็บเพื่อลดเวลารอโหลดและอื่น ๆ บนแอปพลิเคชัน React และการพัฒนาฝั่งหลังบ้านด้วย Express.js เพื่อการจัดการคำขอ โดยใช้ MongoDB เป็นฐานข้อมูลบนคลาวด์

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ABSTRACT

This project is a physical therapy service management platform development by helping physical therapy clinics and their customers by making the appointment process easier and more efficient. Customers can use the app to find clinics, book appointments, and see pricing. The application also helps clinics streamline their operations by keeping everything in one place.

By building a platform as web applications with modern development framework, Next.js, with improved SEO (Search engine optimization), server-side rendering for shorter load time and more, on React application. And back-end development with Express.js for request handling with MongoDB as a cloud database.

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Moreover, we cannot forget the indispensable role played by our product owner, Ms.Sawita Poongthaisong. Her expertise in physical therapy services, helped us to define the appropriate requirements.

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Yanisa Poongthaisong

Pavinee Suthamjeam

03 April 2023

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Chapter 1

Introduction

1.1 Project rationale

This project is the platform development of physical therapy clinic management system for physical therapists and the web application for general people who are interest to access to physical therapy services with the proposal of the usage of management system to physical therapists, and their employees to interact with multiple patients that therapists can enjoin their routine work introducing time and cost-effectiveness into everyday operation more conveniently.

Through this application, anyone can registered their clinic into the system and provides necessary information to become a verified physical therapy service providers. The application presents features to manage their clinic business for instance, employee management, time slot availability, package or courses that the clinic provides and offers, maintain records of patient report, appointment management features and reviews.

The project also provides a convenience web application to support people in general with the function to explore clinics, compare courses or service packages, easily look up to their upcoming appointment schedule, and get information about physical therapist clinics from anywhere.

1.2 Objectives

1. To create a platform that allows general people to connect to multiple physical therapy clinics in one application more conveniently.
2. Introduce and design an all-in-one platform for physical therapy businesses with time and cost-effectiveness of routine work into everyday operation.

1.3 Project scope

1. A platform supports physical therapy businesses, their customers, and potential customers.
2. A web application for 3 groups of users;
 - Customer/patient including elders and relatives register, browse clinic information and make a reservation for an appointment in advance.
 - Clinic owners to register, and manage incoming requests for their services.

- Platform administrators can approve registration to become a verified clinic.

1.4 Expected outcomes

1. General people and clinic owners have a one-place community platform to connect and reach a seamless experience of physical therapy care.

1.5 Technology and tools

1.5.1 Software technology

1. Next.js: React web application and API development framework.
2. MongoDB: NoSQL database program, highly available, scalable, and flexible schema approach.
3. Visual Studio Code: Tool to help a developer to develop the software.
4. Vercel: A hosting platform for frontend frameworks and static sites.

1.6 Project plan

Task	Nov 2022	Dec 2022	Jan 2023	Feb 2023	Mar 2023	Apr 2023
Research, Proof of concept and gather requirements						
UX/UI Design						
Developing the platform and usability testing.						
System Integration Testing and User Acceptance Test.						
Collect feedback, final report documenting and create youtube clip.						

1.7 Roles and responsibilities

1. Pavinee Suthamjeam is a UX/UI designer, full-stack developer, requirement analyst, and tester.
2. Yanisa Poongthaisong is a UX/UI designer, full-stack developer, requirement analyst, system designer, and tester.

1.8 Impacts of this project on society, health, safety, legal, and cultural issues

This project designed to support physical therapy businesses and local communities as expected, moreover this platform has the potential to be continue and adapted further to suit other similar types of businesses to have a convenient platform to provide their services.

Chapter 2

Background Knowledge and Theory

This project was beginning with process to define each features enabling solution for the end users. Researching on related technologies and theories. This chapter provides the project background for readers to simply understand the content of the next chapters.

2.1 Problem

According to our product owner, Sawita's physical therapy clinic, the owner is lacking a tool to help with time slot management, appointment, and their patient information in one place.

We also found that many clinic management systems that is existing in the present were not present in Thai language making it difficult to use for physical therapy clinics in Thailand. Moreover, the design were not simple to use and has user interface design that is being antiquated which means that the owner demur to use the service of those software in the market and manage all data by oneself instead.

2.2 Approach and Goals

We aimed to make a new solution for customers to have reserve appointment easily and physical therapy businesses to have easy to use management tool. Our purposed in design and development aimed to:

Clinic Management :

- Making information such as appointment, time slot, patient, clinician becomes conveniently manage.
- Clinics can manage their information in one place.
- Build a tool that appears in Thai language and has a modern user interface.

Customer/Patient :

- Make appointment reservation process with any clinics can be done by customers themselves.
- Appointment detail and schedule is present online for easily lookup at anytime.

2.3 Physical Therapy Business and Management Software Solutions

Any business or service that has clients and suppliers and a team needs management system or a system like Customer relationship management or "CRM", this designed system is heavily beneficial to the business owners and in demand, especially the one where scheduling is important and working routines are repetitive as well as our target business; physical therapy business.

Physical therapy clinic can benefit from the system in many ways [5]:

- To market physical therapist services
- To organize a patient database and patient record management
- To systemize appointment management
- To perform inventory management
- To streamline appointment process
- To keep track of progress notes available for all stakeholders
- To use advanced reporting and analytical tools to patients' benefits

2.4 Software Research

This section provides the research on existing platform application in the present market that relatively inspired and similar to use as a concept in the project.

2.4.1 One Medical

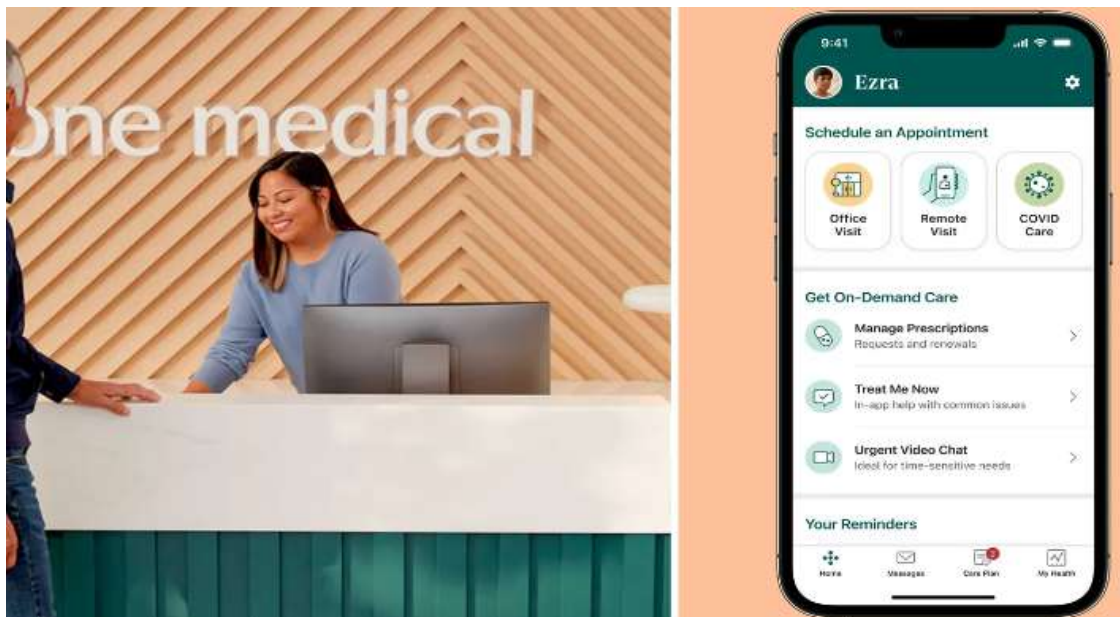


Figure 2.1: One Medical [2]

One medical app provides free, 24/7 virtual care from anywhere in the world. Whether a prescription refilled, need care for a common health issue like the flu, or have a follow-up question after appointment, help at fingertips.

2.4.2 JERA Dent



Figure 2.2: JERA Dent [4]

A complete clinic management system that built specifically for dental clinics, it was released since 2018 under the development of Lamunpun IT company aim to help the clinics to have a modern tool in management.

2.5 Development Framework

2.5.1 Front-end

React.js



Figure 2.3: React.js [12]

React (also known as React.js or ReactJS) is a free and open-source front-end JavaScript library[3] for building user interfaces based on components. It is maintained by Meta (formerly Facebook) and a community of individual developers and companies.

React can be used as a base in the development of single-page, mobile, or server-rendered applications with frameworks like Next.js.

Next.js



Figure 2.4: Next.js [9]

Next.js is a react web application development framework. It wraps up react and associated tools into one package include with lots of features. Makes it easy to use react to make multi-page application. Providing routing server-side rendering and hot module reload and controls application behind the scenes, build step and lots of serving up different files.

2.5.2 Back-end

MongoDB



Figure 2.5: MongoDB [11]

MongoDB is a source-available cross-platform document-oriented database program. Classified as a NoSQL database program, MongoDB uses JSON-like documents with optional schemas.

Express.js



Figure 2.6: Express [10]

Express is a back end web application framework for building RESTful APIs with Node.js, released as free and open-source software. It is designed for building web applications and APIs. It has been called the de facto standard server framework for Node.js.

2.5.3 Environment

Visual Studio Code



Figure 2.7: Visual Studio Code [6]

Visual Studio Code is a lightweight and powerful source code editor which runs on our desktop with built-in support for JavaScript and Node.js and has a rich ecosystem of extensions for multiple languages.

Docker Compose



Figure 2.8: Docker Compose [8]

Docker Compose is a tool for defining and running multi-container applications. With Compose, you use a YAML file to configure your application's services (containers). Then, with a single command, you can build, start or delete your application services.

2.6 Design Framework

2.6.1 Figma



Figure 2.9: Figma [3]

Figma is a vector graphics editor and prototyping tool enabled product teams to ship products faster towards a shared goal. Focuses on use in user interface and user experience design, with an emphasis real-time collaboration.

2.7 Deployment Framework

2.7.1 Vercel



Figure 2.10: Vercel [13]

Vercel is a cloud platform that allows to host applications on the web. Vercel maintains the Next.js web development framework. Its architecture is built around Jamstack, and deployments are handled through Git repositories, and it is compatible with static sites and multiple different frameworks such as React or Vue.

2.8 ISNE knowledge used, applied, or integrated in this project

Fundamentals of database systems: design database system, create CRUD application, diagram to collect data.

Web Programming Language: make a web application and tools to push changes i.e., Git.

Software Engineering: Development process of the project. Initialize and define requirements, documentation, and work system from start to the end of the software product and development.

Platform Programming: know about availability, usability, and architecture to develop platform application.

Project Management for Information Systems and Network Engineering: Manage the process of the project, understand feasibility, limitations, time, budgeting, and people.

Information Systems: This project involved with the knowledge of information systems to design the management system.

2.9 Extracurricular knowledge used, applied, or integrated in this project

For this project, we have applied the design skills obtained by the taking external courses, programming, version control, websites deployment, and software development skills that we learned by taking many other online media such as Udemy and Youtube, etc.

2.10 Project Management



Figure 2.11: Issue Flow in Jira

Tasks were assigned to assignee based on experienced and skills. Each tasks are called "Ticket". When a ticket is added, it must included ticket number, reporter, assignee, development section such as backend or frontend, application such as clinic or customera and a title. We also included priority for tickets if the particular sprint filled with multiple of tasks.

Assignee that responsible for changing the status of the ticket, provide artifact when done, provide related links if there needed. Figure 2.9 shows the status of ticket in a whole cycle from initial until complete.

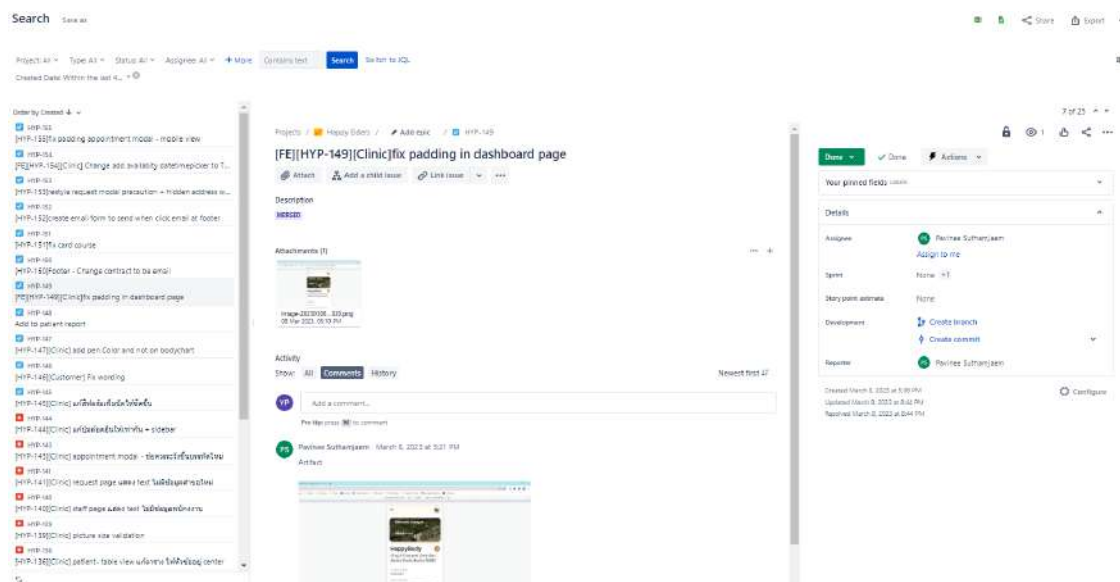


Figure 2.12: Jira Tickets

Chapter 3

Project Structure and Methodology

This chapter is the explanation about the design of the platform, user flow, use case diagram and overview on how the platform application works.

3.1 Use Case Diagram

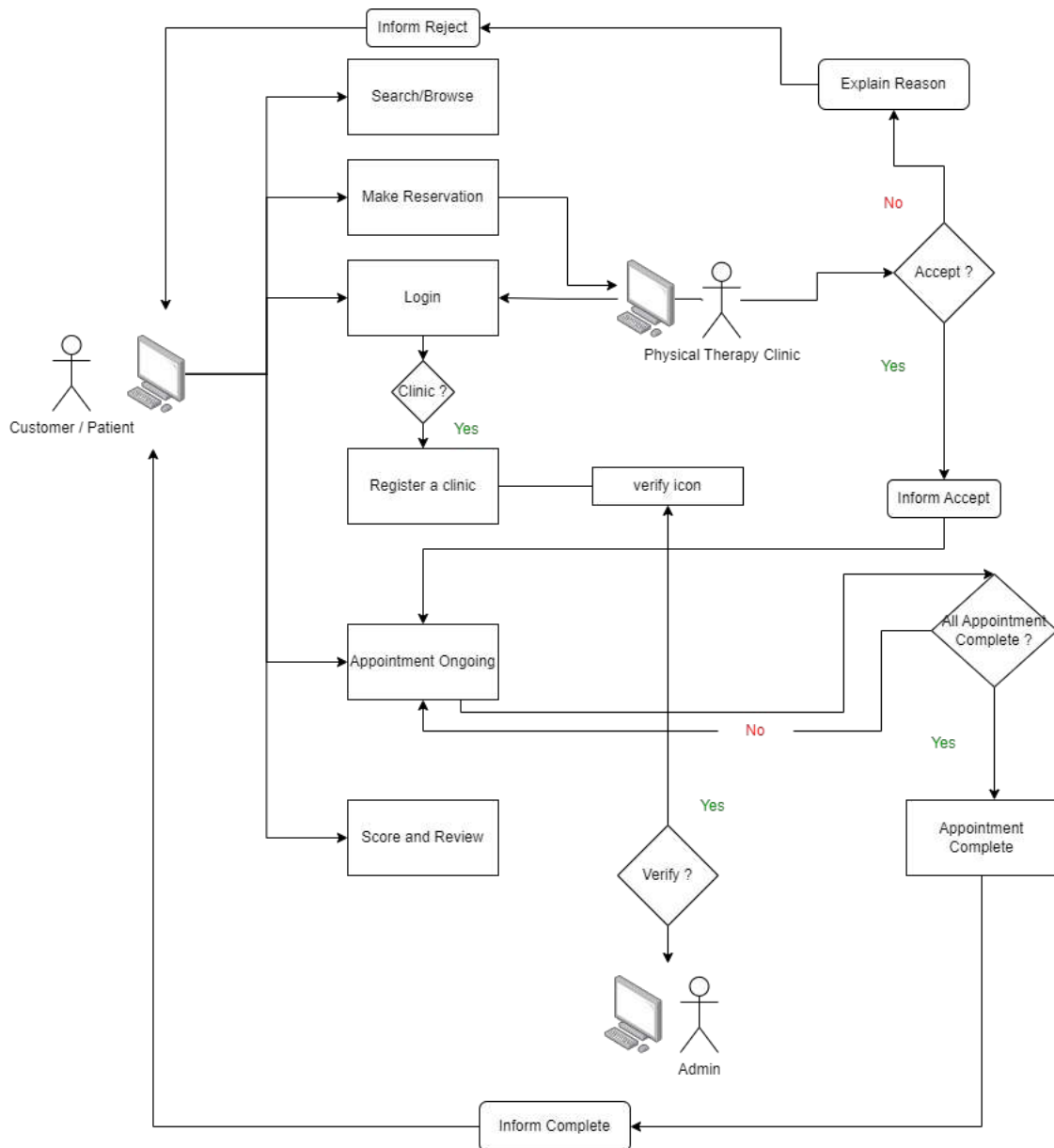


Figure 3.1: Use case diagram

From figure 3.1, shows the flow where customers make reservation for an appointment that interacts with the clinic application. The diagram also appears when admin verify the clinic.

3.2 Integration Architecture

From figure 3.2, it presents a system diagram of the applications with tools and frameworks. All three frontend web applications are Next.js application deployed on Vercel and use OAuth service from NextAuth.js with the chosen providers; Google and LINE Login for authentication.

The server-side framework is Express.js running inside a Node.js server and interact with MongoDB Database using Mongoose. We use Github Version control integrates with automatic deployments on Vercel on every push that merges onto the production branch.

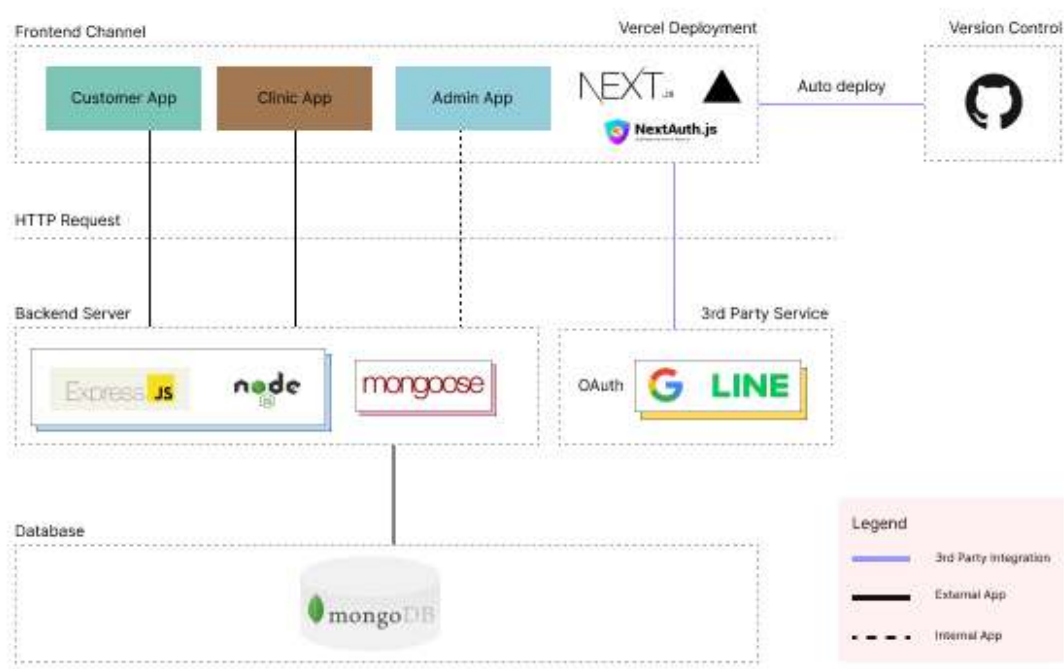


Figure 3.2: Integration architecture diagram

3.3 Final look and feel

3.3.1 Appointment Reservation

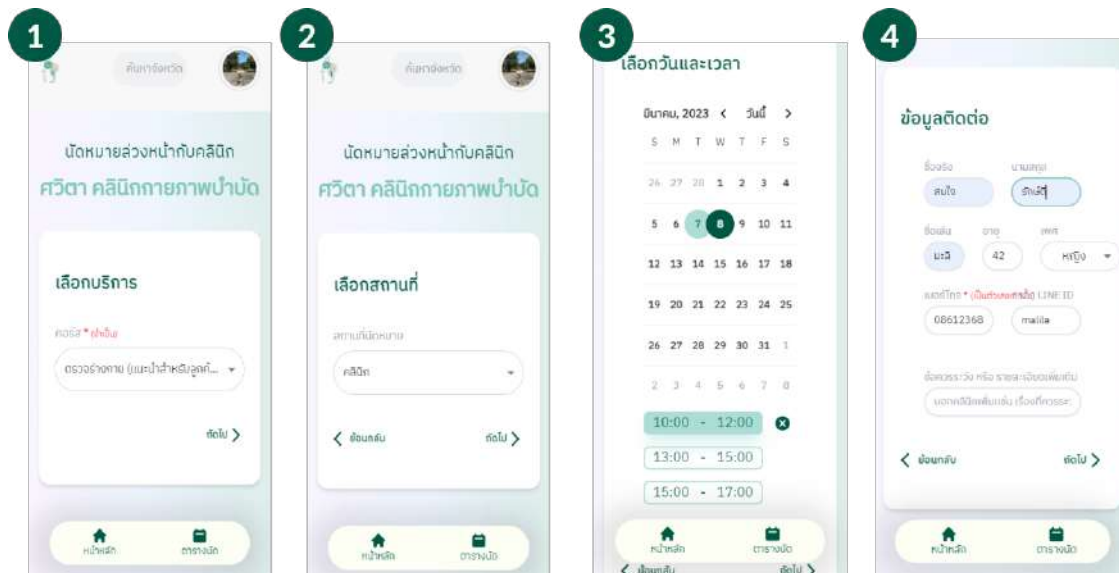


Figure 3.3: Appointment Reservation

Figure 3.4 shows the step for customer to make a reservation with a selected clinic.

	Action	Description
Step 1	Choose a service	User has to select the service from the lists that the clinic provided.
Step 2	Choose appointment place (optional)	The default is at the "clinic", but customer can also choose to be treated at "home", which will require to enter information of home address.
Step 3	Pick the date and time	These date and time was set by the clinic owner
Step 4	Fill in personal information	Only phone number is a required.
Step 5	Choose clinician. (optional)	The default is "any". However, customers may select their preferred clinician.

Table 3.1: Appointment Journey

3.3.2 Customer/Patient Application

Register and Login

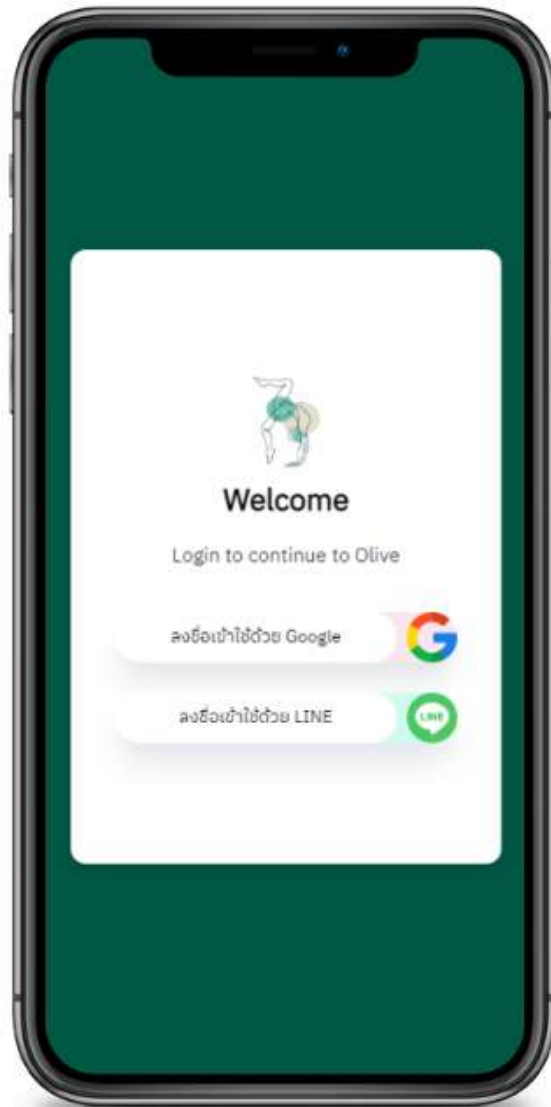


Figure 3.4: Login Screen

Figure 3.5 Users can choose to register and login between Google account and LINE.

Landing Page



Figure 3.5: Landing Page

Figure 3.6 shows a home page which shows a list of all the clinics that is registered into the system. The verified clinics have a verified icon right next to the clinic's name.

Clinic and Service Pricing

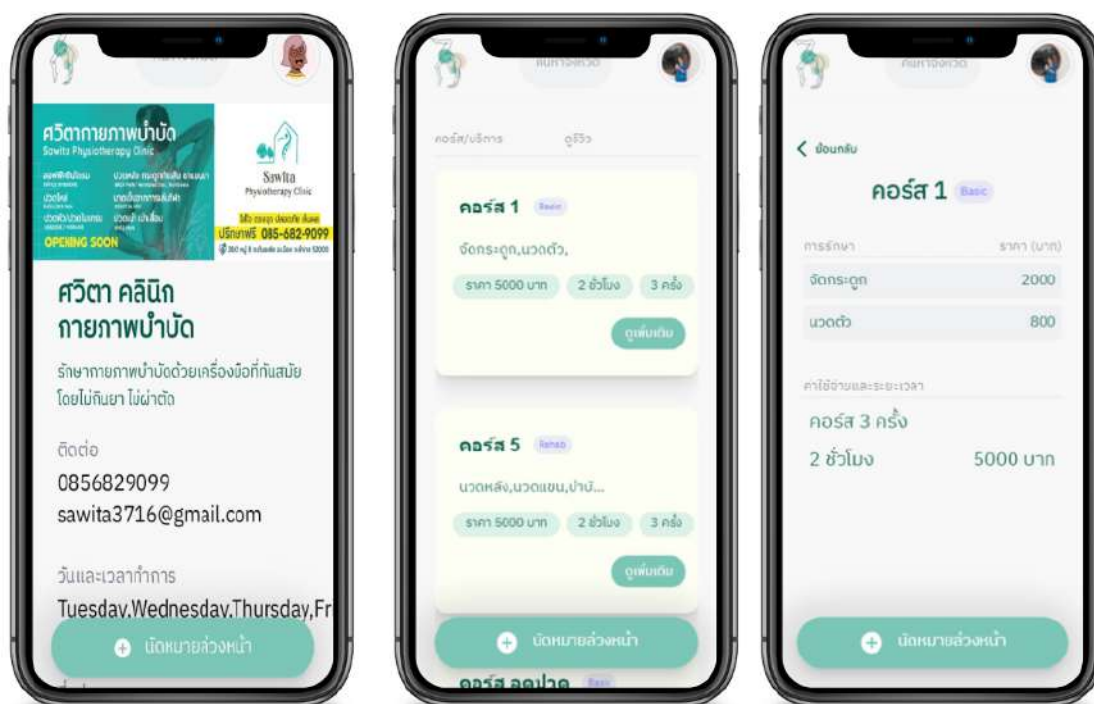


Figure 3.6: Clinic and Service Packages

Figure 3.7 shows information about clinic as an individual and detail of all the services that the clinic is providing.

User Account

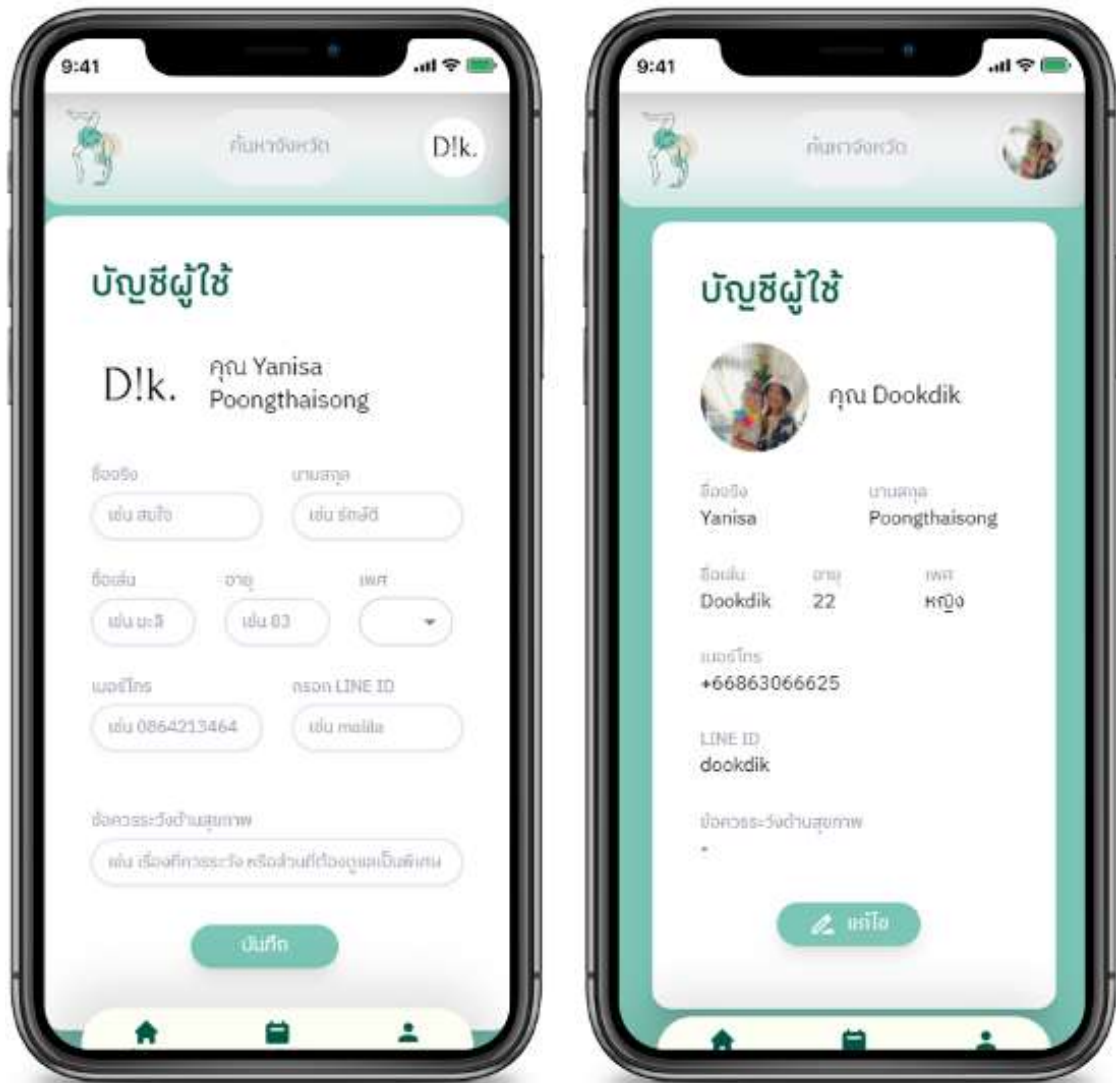


Figure 3.7: Account Page

Figure 3.7 This page is an account profile of the individual user to add their contact and other information. They can edit this information anytime. This information can be used when they are making an appointment and can be reuse with any clinics they are creating a new appointment with that they don't have to manually fill the information again.

User Account Suggestion Banner

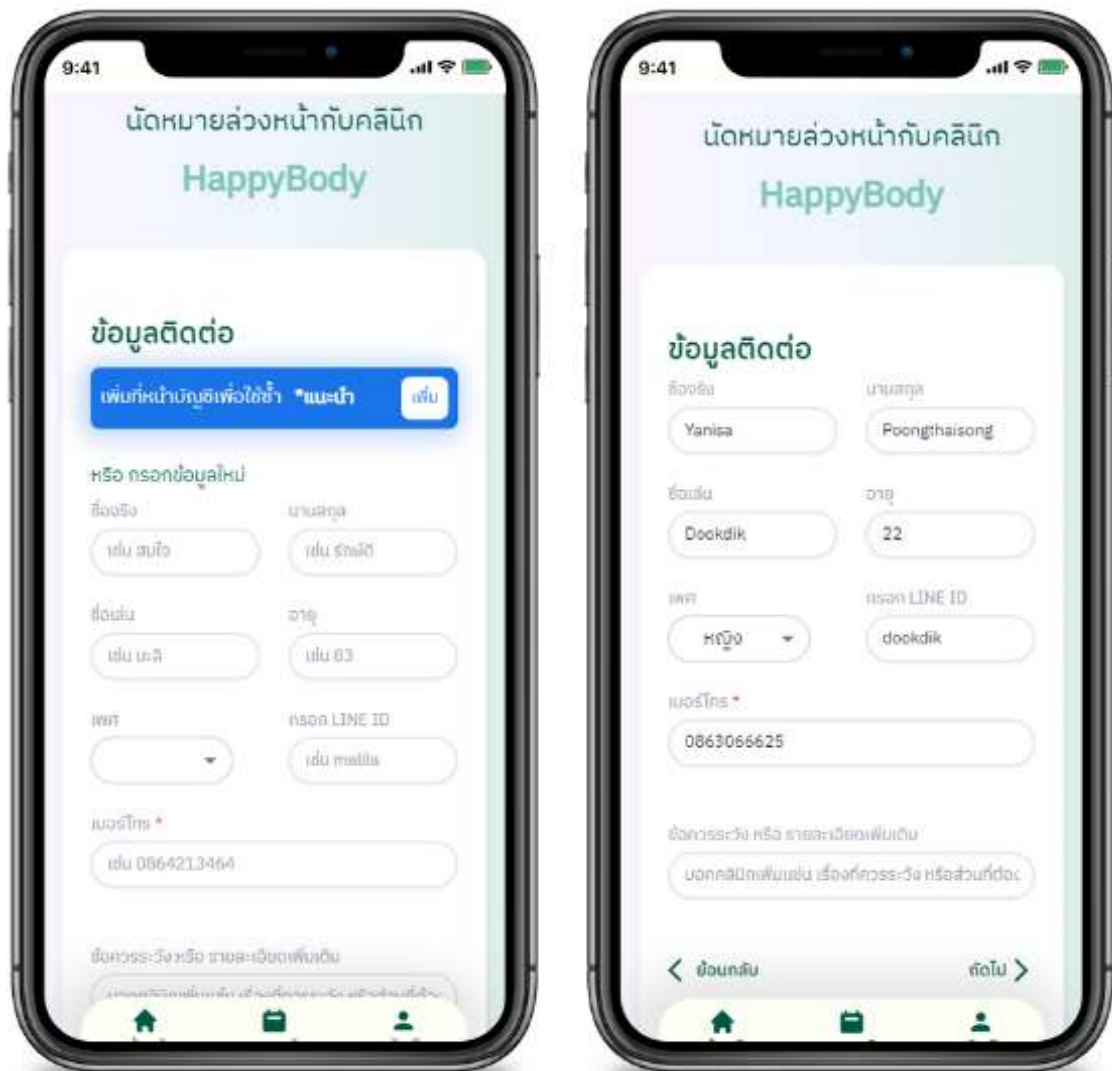


Figure 3.8: Notification banner

Figure 3.8 shows the suggestion banner will be appeared if the user have never added their account information to go to account page and add their information which can be reused.

The right image shows when user has an account information added, the information will automatically fetched and displayed. They can still manually type the input which will only make changes in the appointment they are currently making.

Review

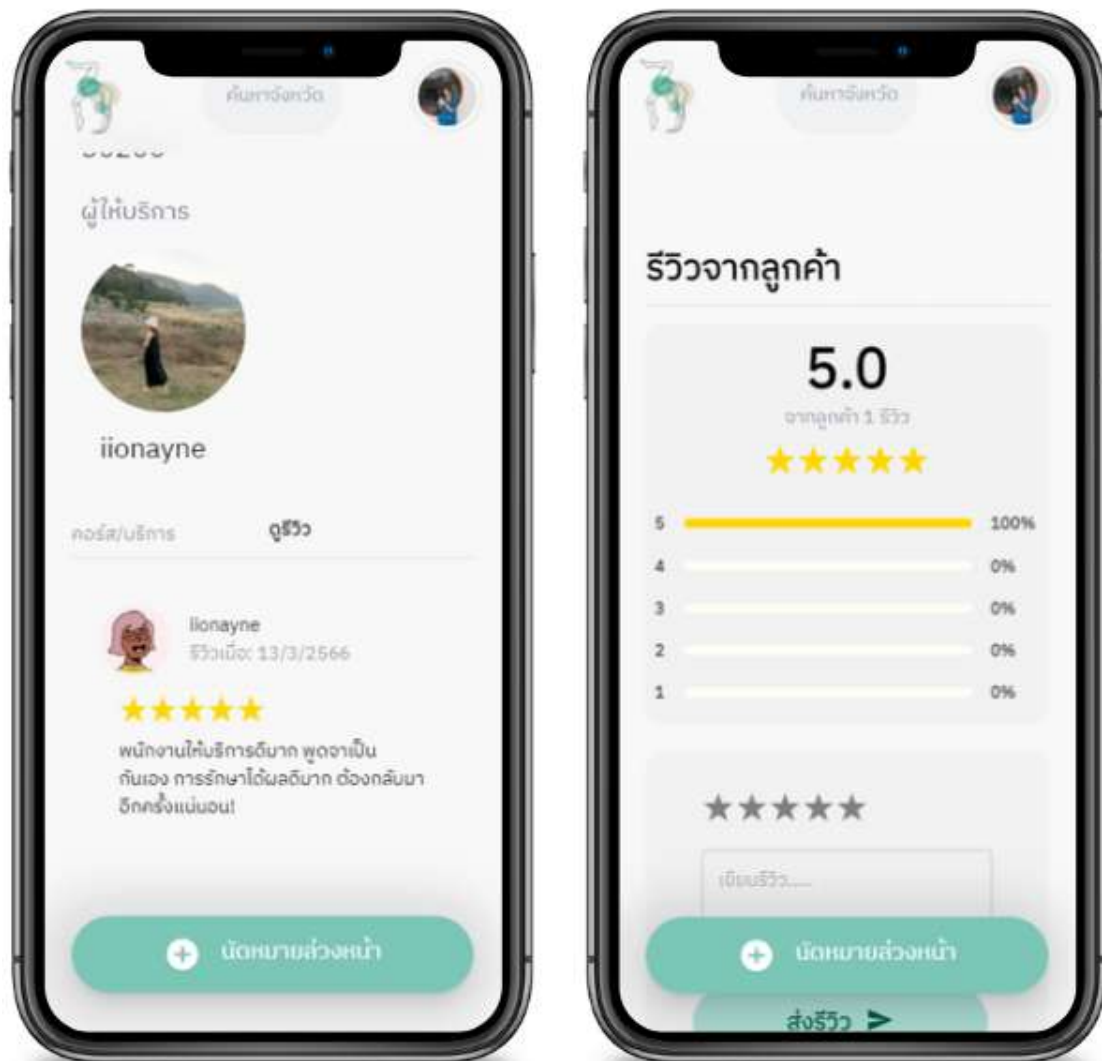


Figure 3.9: Score and Review

Figure 3.9 shows the review and overall scores that the clinic received from its customers. The information of the review included reviewer's name, date of the review, score and written comment if there is any. The review page also includes the average score that is calculated by the each score that the clinic received divided by the total number of reviews.

After Reservation



Figure 3.10: After Reserved

Figure 3.10 shows "continue and review" page for users to recheck the accuracy of the information. The right next page is "success" page which will appear once the reservation has been sent to the clinic successfully.

My Schedule and Appointment

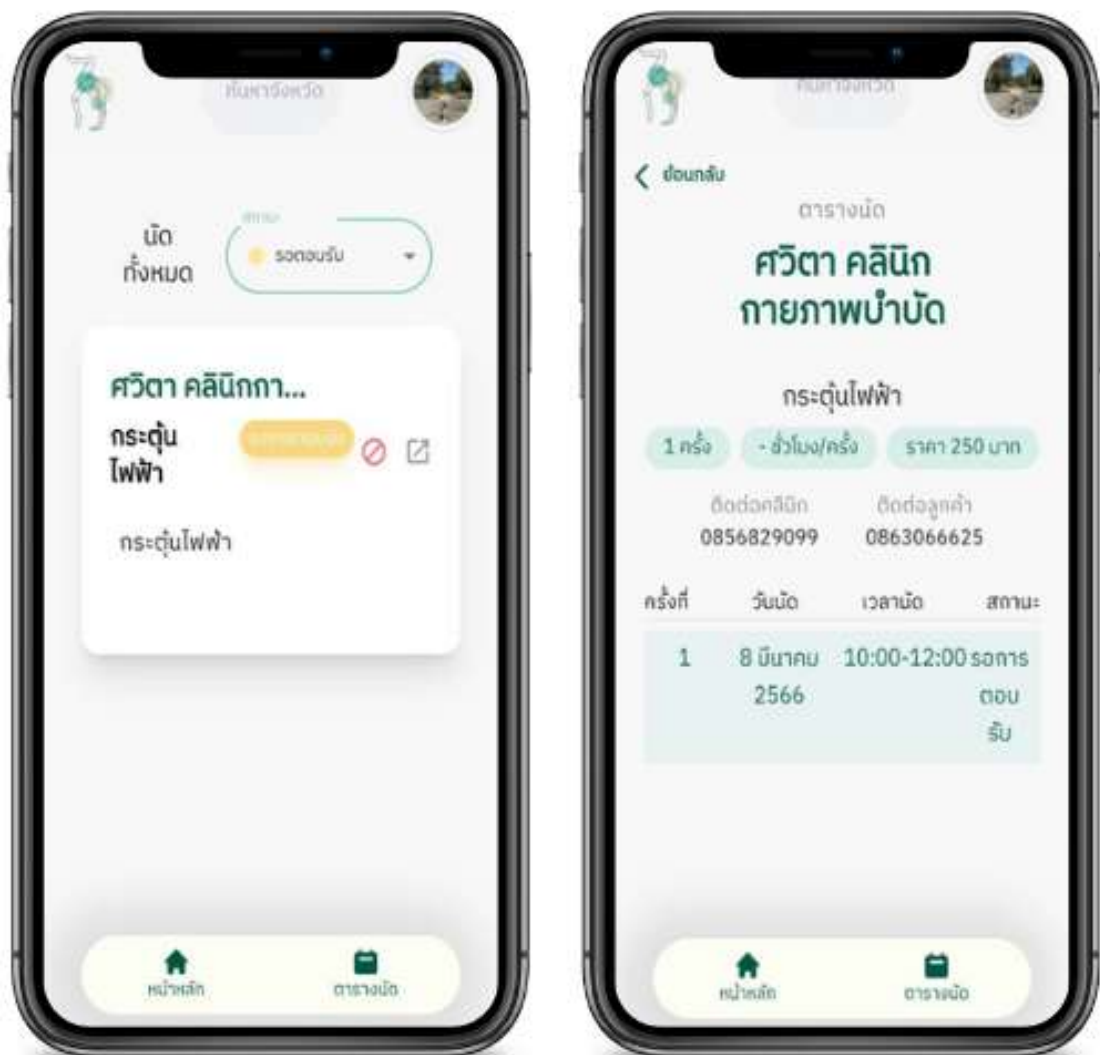


Figure 3.11: My schedule

Figure 3.11 shows "my schedule" page which has all the appointments that can be filtered by the status of the appointment included: approved, pending, rejected, completed and all status.

When user click at one appointment card, it will navigate to the right next image page which shows the information in details about that appointment such as information of the clinic, the service and the table with the fields of no., date, time, and status.

Appointment Tracking



Figure 3.12: Appointment Tracking

Figure 3.12 shows "Happy Track" page which enable user to see their appointment detail without having to login. They can see their appointment detail by enter the appointment's id.

3.3.3 Physical Therapy Clinic Management Application

Register and Login

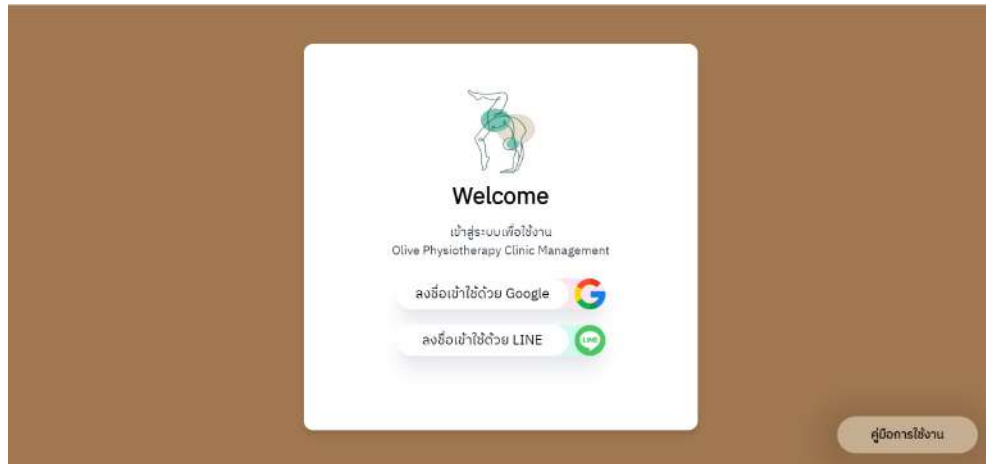


Figure 3.13: Login Screen

Figure 3.13 Users can choose to register and login between Google account and LINE.

Clinic Registration



Figure 3.14: User who has never registered a clinic

Figure 3.14 shows the page after user logged in but has never registered a clinic before. The button shown in the middle to take user to the clinic registration page.

สร้างคลินิก

ชื่อคลินิก

ชื่อเจ้าของ

ที่อยู่

เบอร์โทรศัพท์ของคลินิก

อีเมล

ราคาเริ่มต้น (฿/ชั่วโมง)

อัปโหลดรูปคลินิก

Choose File No file chosen

วันเปิดของคลินิก *

เวลาเปิดคลินิก

เวลาปิดคลินิก

ใส่คำอธิบายคร่าวๆเกี่ยวกับคลินิกของคุณ เพื่อให้ผู้คนได้รู้จักคุณดีขึ้น

ปุ่มการใช้งาน

Figure 3.15: Create Page

Figure 3.15 shows the clinic registration page.

☰

Physiotherapy Clinic

หน้าหลัก

คำขอรับบริการ

นัดหมายดูแล

จัดการวันว่าง

คอรส์

พนักงาน

แบบบันทึกรายงานผู้ป่วย

รีวิว/คะแนน

3 เมษายน 2566

Welcome, Dookdik

Administrator

Yanisa Physical Therapy Clinic

28/3 Napor-Baaneum Rd., Tontongchai

พนักงานคุณภาพ แอร์เย็น น้ำดื่มฟรี

เบอร์ติดต่อคลินิก

0863066625

ปุ่มการใช้งาน

Figure 3.16: Home Page

Figure 3.16 shows the information of clinic the information can edit anytime ,also show number for new request and today appointment.

New Appointment Request Page

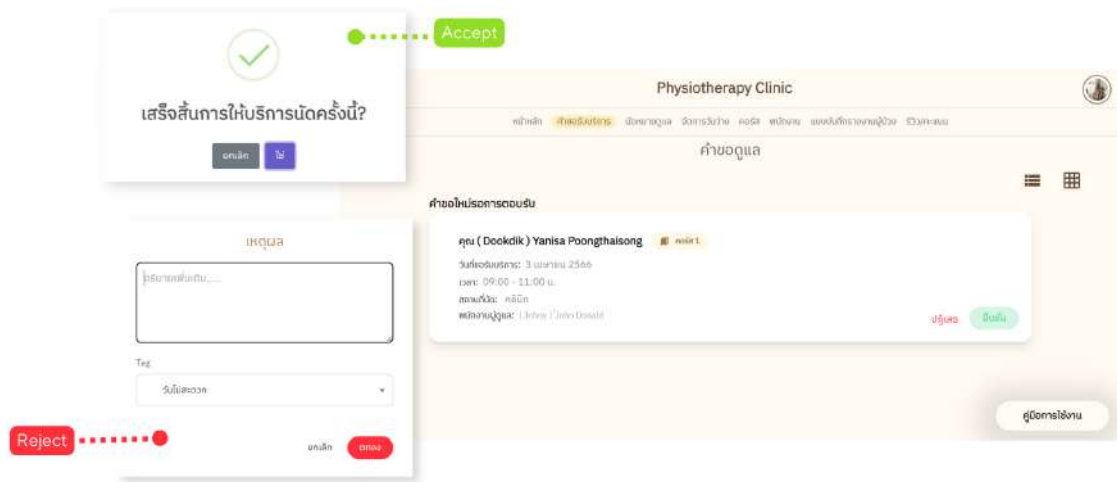


Figure 3.17: Request From Customer

Figure 3.17 shows the request from customer that clinic have to accept or decline.

Accept and Reject Request

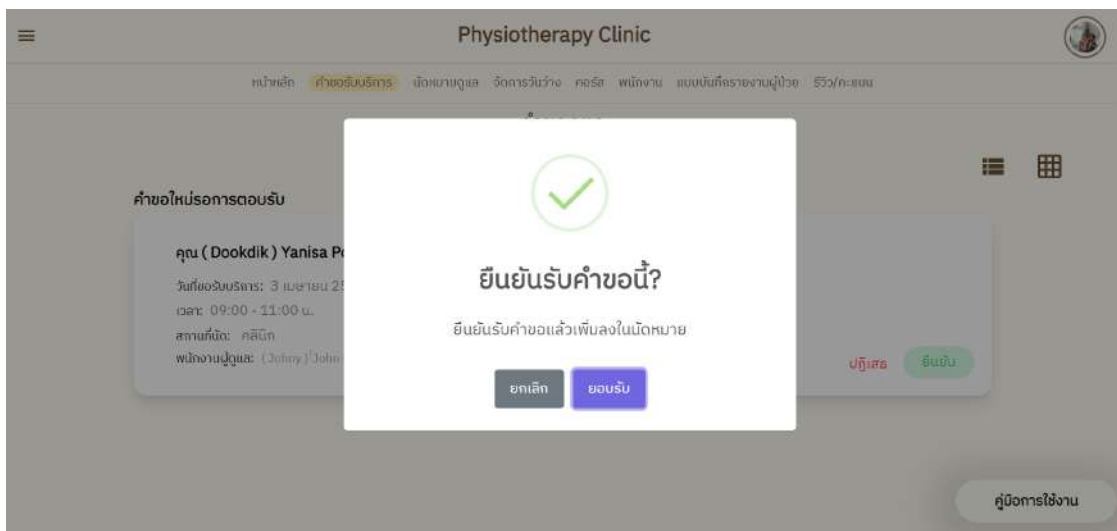


Figure 3.18: Accept Request

Figure 3.18 Shows when clinic accept request form customer.



Figure 3.19: Decline Request

Figure 3.19 Shows when clinic decline request, clinic have to write reason why decline the request.

All Request From Customer



Figure 3.20: All Request Page

Figure 3.20 Shows all request which are conclude rejected, accept and complete requests.

Request Detail

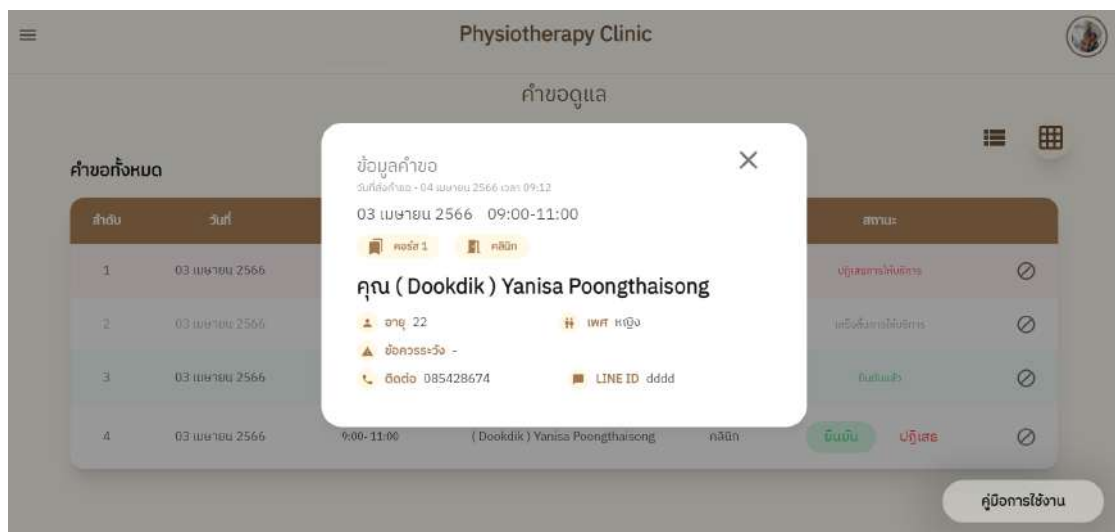


Figure 3.21: Request Detail Page

Figure 3.21 shows detail of each request.

Appointment Page

Calendar View



Figure 3.22: Appointment Page

Figure 3.22 shows appointment by date.

Table View



หมายเลข	ลูกค้า	สถานะ	คงเหลือ
642a10c161...	(Dookdik) Yanisa Poongthaisong	ปฏิเสธการให้บริการ	1/2
642a3f8f615...	(Dookdik) Yanisa Poongthaisong	เสร็จสิ้นการให้บริการ	2/2
642a242a05...	(Dookdik) Yanisa Poongthaisong	ยังไม่เสร็จ	1/1

Figure 3.23: All Appointment list

Figure 3.23 shows all appointment includes on going, complete and reject.

Appointment Detail



ตารางนัด

(Dookdik) Yanisa Poongthaisong

อายุ 22

ชื่อคุณระวีง

ติดต่อ 085428674

LINE ID dddd

ที่อยู่

สถานที่นัด คลินิก

คอร์ส 2 Basic

จำนวน 1 ครั้ง

ราคา 690 บาท

ครั้งละ 2 ชั่วโมง

NO. 642A242A05A76F751CBCEAE6

ครั้งที่	วันที่	เวลา	สถานะ
1	3 เมษายน 2566	10:00 - 12:00	bodychart

Figure 3.24: Appointment Detail

Figure 3.24 shows more details of appointment, customer information, appointment place.



Figure 3.25: Appointment Detail

Figure 3.25 shows course details and appointment date. User can also add next appointment on this page until maximum amount of course's appointment.

Sub Appointment

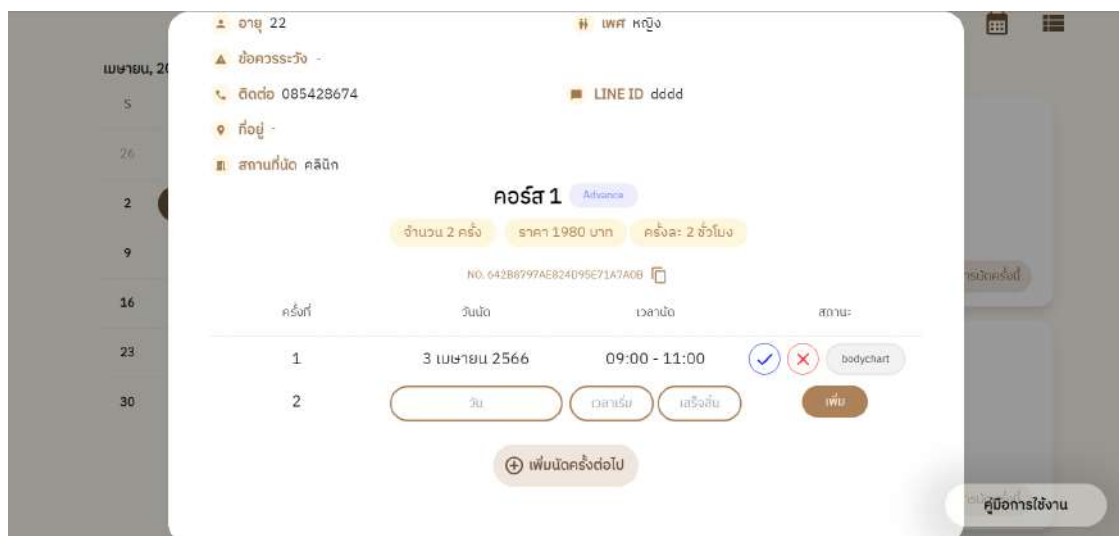


Figure 3.26: Add sub appointment

Figure 3.26 shows how to add new sub appointment

- step 1: click add next appointment button
- step 2: select date and time
- step 3: click add

Complete Sub Appointment

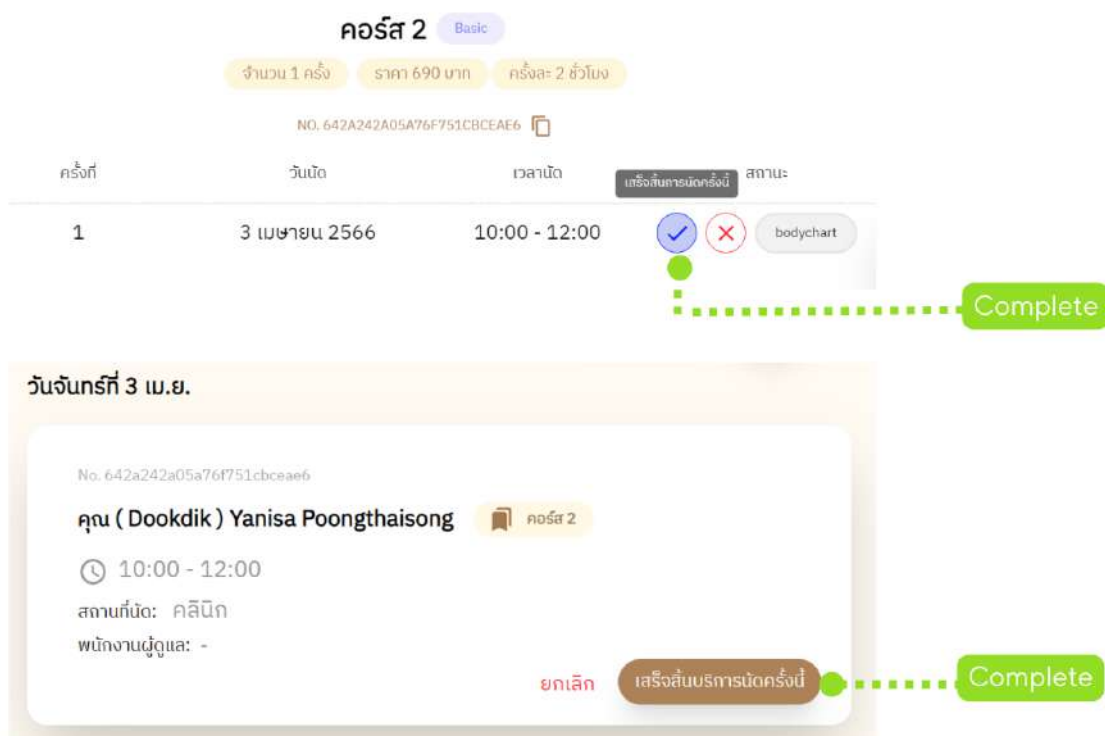


Figure 3.27: Complete Sub Appointment

Figure 3.27 shows how to complete each sub appointment there are 2 approach to complete.

1. click เสร็จสิ้นนัดหมายครั้งนี้ in calendar view of appointment page
2. click check symbol of sub appointment date in detail of the appointment.

Complete Service



Figure 3.28: Complete Service

Figure 3.28 shows button "เสร็จสิ้นการให้บริการ" that the clinic has to complete. When all of the sub appointments in each course are done, customer will be able to write a review and give a score after complete the service.

Add New Appointment by Clinician

Figure 3.29: Add new Appointment by Clinic

Figure 3.29 shows the form to add new appointment by clinician. User can select the patient from the existing patient that is recorded in a system or make a new appointment by manually type a new patient information.

Body Chart and Progression Note

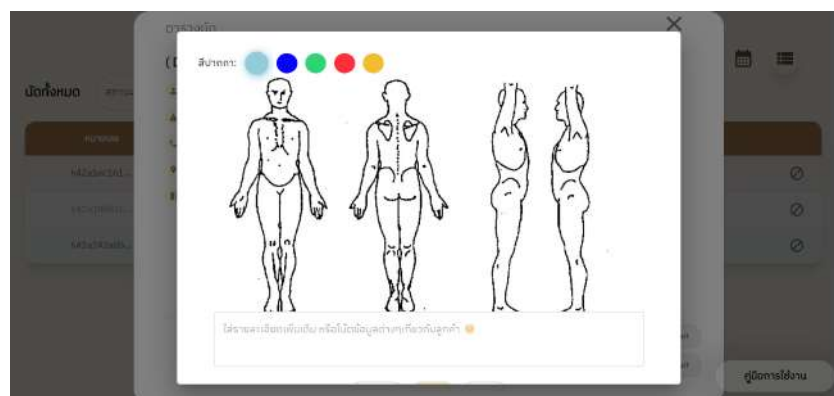


Figure 3.30: body chart and progression note

Figure 3.30 shows a body chart that a clinician can draw to specify symptoms, change pen's color to indicate level of pain, and add a progression note to every appointment. This digital drawing pad and pen feature is done by using **React signature canvas** that captures a person's handwritten on a device. The image of a general body chart was added later on top of the react-signature-canvas [1] component.

Time Slot Management



Physiotherapy Clinic

จัดการวันว่าง

เพิ่ม

เมษายน, 2023 < วันนี้ >

วันจันทร์ที่ 3 เม.ย.

9:00 - 11:00

10:00 - 12:00

คู่มือการใช้งาน

Figure 3.31: list of time slots

Figure 3.31 shows time slot when the clinic is available to provide a service for customer. The slot will appear in customer application to let them select when reserving an appointment.

Set Available Time Slot



เพิ่มวันและเวลาว่าง

วัน

04-04-2023

เวลาเริ่ม

9:00 ก่อนเที่ยง

เวลาสิ้นสุด

11:00 ก่อนเที่ยง

ยกเลิก ตกลง

Figure 3.32: Add time slot form

Figure 3.32 shows the form to add date and time slot.

Service Package Management

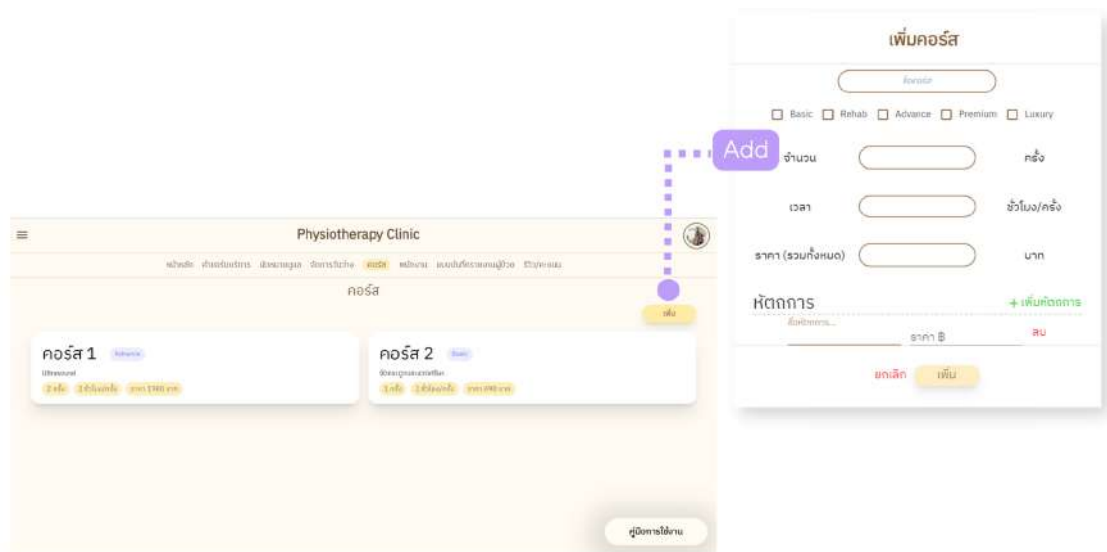


Figure 3.33: list of all courses

Figure 3.33 shows all courses or services that clinician have created and the form to add course in clinic, user have to fill all information.

Course Detail

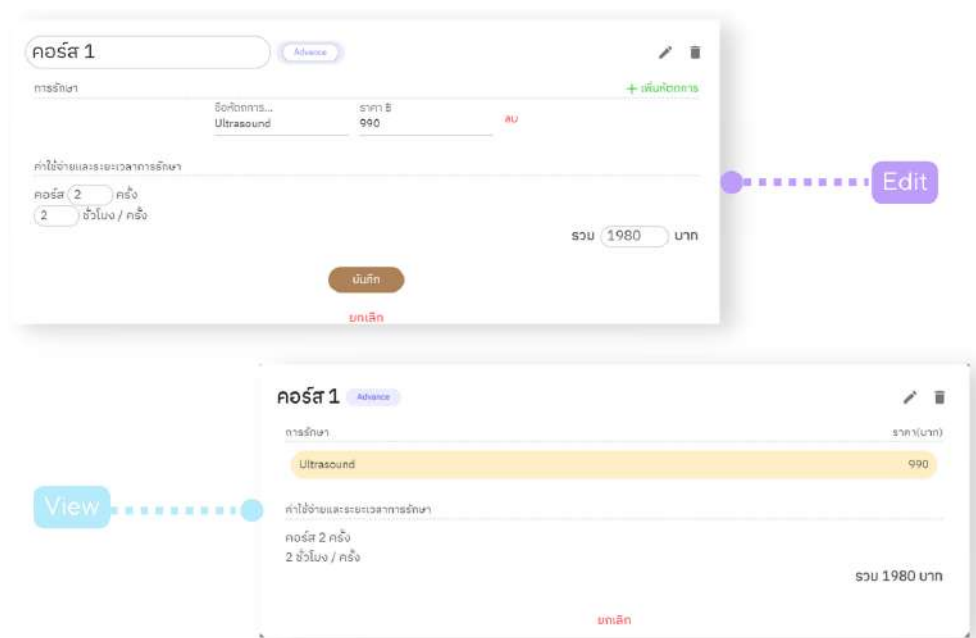


Figure 3.34: course details

Figure 3.34 shows course details that clinician can create, edit or delete. The detail consists of name, medical procedure, pricing, time and amount.

Patient Management

The screenshot displays a web application for a Physiotherapy Clinic. At the top, there is a navigation bar with a menu icon, the clinic name 'Physiotherapy Clinic', and a profile icon. Below the navigation bar, there is a header area with a title 'แบบบันทึกการทำงานของแพทย์' and a 'เพิ่ม' (Add) button. The main content area features a table with patient information. The table has columns for 'ลำดับ' (Serial), 'HN (เลขประจำตัวผู้เสียภาษี)' (HN (Taxpayer ID)), 'ชื่อ-นามสกุล' (Name-Surname), 'อายุ' (Age), 'เพศ' (Gender), 'ติดต่อ' (Contact), and 'LINE ID'. Two patients are listed in the table. A 'View' button is located below the table, and a detailed view of the first patient is shown in a modal window.

ลำดับ	HN (เลขประจำตัวผู้เสียภาษี)	ชื่อ-นามสกุล	อายุ	เพศ	ติดต่อ	LINE ID
1.	03042566	(Jane) Jane Doe	32	หญิง	078236236	janey
2.	0304256602	(Dookdik) Yanisa Pongthaisong	22	หญิง	085428674	dddd

ข้อมูลคนไข้
เพิ่มวันที่: 3/4/2566
HN: 03042566

คุณ (Jane) Jane Doe

อายุ: 32 เพศ: หญิง

ติดต่อ: 078236236 LINE ID: janey

ที่อยู่: 19 Sch Park Plaza West B, 21st Floor, Ratchadapisek Road, Chatuchak Sub-District, Chatuchak District, Bangkok

อาชีพ: nurse ตำแหน่ง: supervisor

ระดับการศึกษา: ปริญญาตรี

รายได้: มากกว่า 30000 - 50000

ข้อมูลด้านสุขภาพ

ชื่อของโรค	Chief Complaint	PT diagnosis
asthma	Low back pain	Office Syndrome

Figure 3.35: Lists of patient information

Figure 3.35 shows lists of patient information for example full name, nickname, age, Hospital number, telephone number etc.,

Add New Patient

เพิ่มแบบบันทึก

ชื่อ	นามสกุล	
<input type="text"/>	<input type="text"/>	
ชื่อเล่น	อายุ	เพศ
<input type="text"/>	<input type="text"/>	<input type="text"/>
ที่อยู่		
<input type="text"/>		
LINE ID	เบอร์โทร	
<input type="text"/>	<input type="text"/>	
อาชีพ	ตำแหน่ง	
<input type="text"/>	<input type="text"/>	
ระดับการศึกษา	รายได้	
<input type="text"/>	<input type="text"/>	
HN (เลขประจำตัวผู้ป่วย)	Chief Complaint	
<input type="text"/>	<input type="text"/>	
PT Diagnosis	Precaution	
<input type="text"/>	<input type="text"/>	

[ยกเลิก](#) [เพิ่ม](#)

Figure 3.36: New Patient Form

Figure 3.36 shows a form to add patient information to save the information of each patient which can be reused for next appointment without having to manually fill the patient information again.

Clinician Management



Figure 3.37: Clinician page

Figure 3.37 shows list of clinician information in a clinic.

Add Clinician

The screenshot shows a form titled "เพิ่มพนักงาน" (Add Clinician). The form has several input fields: "ชื่อ" (Name), "นามสกุล" (Surname), "ชื่อเล่น" (Nickname), "อายุ" (Age), "เพศ" (Gender), "ตำแหน่ง" (Position), "LINE ID", "เบอร์โทร" (Phone Number), and "อีเมล" (Email). There are also "ยกเลิก" (Cancel) and "เพิ่ม" (Add) buttons at the bottom.

Figure 3.38: Add Clinician Form

Figure 3.38 shows a form to add clinician information, those clinicians can be selected by customer(optional) if they want them to do service.

Score and Review Page



Figure 3.39: List of Review

Figure 3.39 shows lists of review and score form customer.

3.3.4 Admin Panel

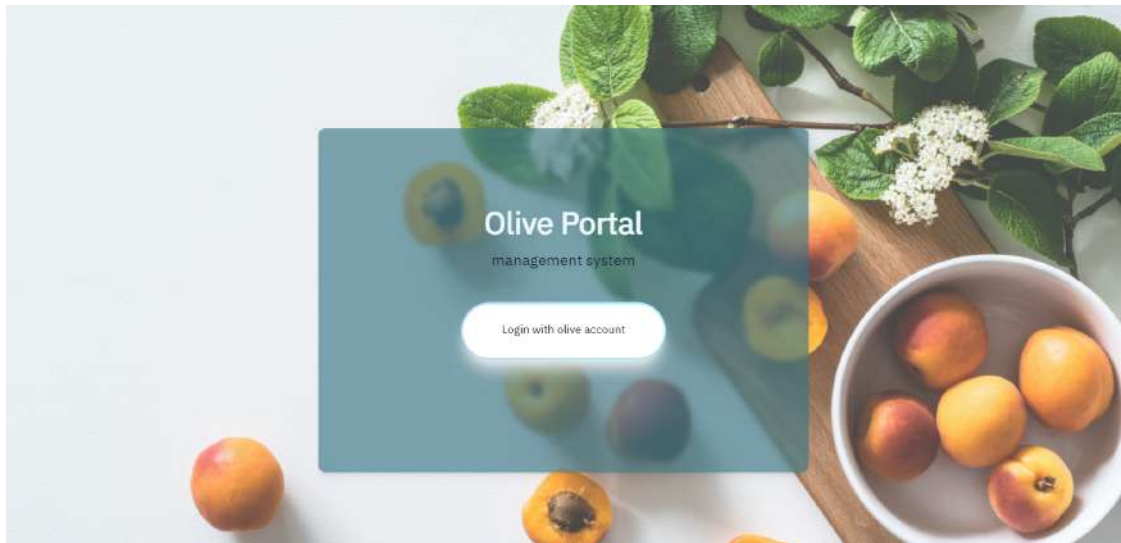


Figure 3.40: Login

Figure 3.40 shows the login page for admin panel.

Name	Address	Owner	Phone Number	Email Address	Status
คลินิก คลินิกกายภาพบำบัด	281/2 บ.8 ซ.สีฟ้า-พหลโยธิน ต.เมืองใหม่ อ.เมือง จ.เชียงใหม่ 50000	DUSOOK	00960210999	sewita3718@gmail.com	Authorized
HappyBody	46 หมู่ 8 ตำบล ชะมด ตำบล เมืองใหม่ อ.เมือง จ.เชียงใหม่ 50200	lanyne	0964499401	ppppavina@gmail.com	Unauthorized
ธีวระณ	ถนนสีหะราชูทิศ	Pisachan Kongs	399	namnir.athorn@gmail.com	Unauthorized
คลินิกเสริมฟันสวยแบบดิจิทัล	โพธิ์ทอง	Witaphon Wanggich	0999999999	khmm@kitty.com	Unauthorized

Figure 3.41: Clinic Lists

Figure 3.41 shows the lists of registered clinics and details. In this page, admin can verify, delete, and undo the verification of the clinic.

3.3.5 API Endpoints

This table below shows some of API endpoints and method in the applications.

Endpoint	Method	Action
/clinic	GET	List all clinics
/clinic/create	POST	Create new clinic
/clinic/update/:id	PUT	Update clinic's information
/clinic/delete/:id	DELETE	Delete one clinic
/clinic/:id	GET	Get a clinic by Id
/appointment	GET	List all appointments
/appointment/match/:clinicid	GET	List all appointments match by clinic id
/appointment/create/:clinicid	POST	Create new appointment match by clinic id
/appointment/:id	DELETE	Delete appointment
/review/match/:clinicid	GET	Get review of particular clinic
/review/create/:clinicid	POST	Create a new review of particular clinic
/course/match/:clinicid	GET	List all courses match by clinic id
/course/create/:clinicid	POST	Create new course match by clinic id
/course/:id	DELETE	Delete one course
/staff/match/:clinicid	GET	Get clinician of particular clinic
/staff/create/:clinicid	POST	Create a new clinician
/patient/match/:clinicid	GET	Get patient of particular clinic
/patient/create/:clinicid	POST	Create a new patient
/available/match/:clinicid	GET	Get time slot of particular clinic
/available/create/:clinicid	POST	Create a new time slot

Table 3.2: Endpoints

3.3.6 Database

Entity Relationship Diagram

ER diagram view of MongoDB schema of database using Hackolode Software [7] which is one of technology partner of MongoDB Inc. to reverse engineer of this project's existing database by connecting ATLAS URI connection string to visualize an ER diagram view. The data model in the picture below results from the reverse-engineering of the daycare_db.

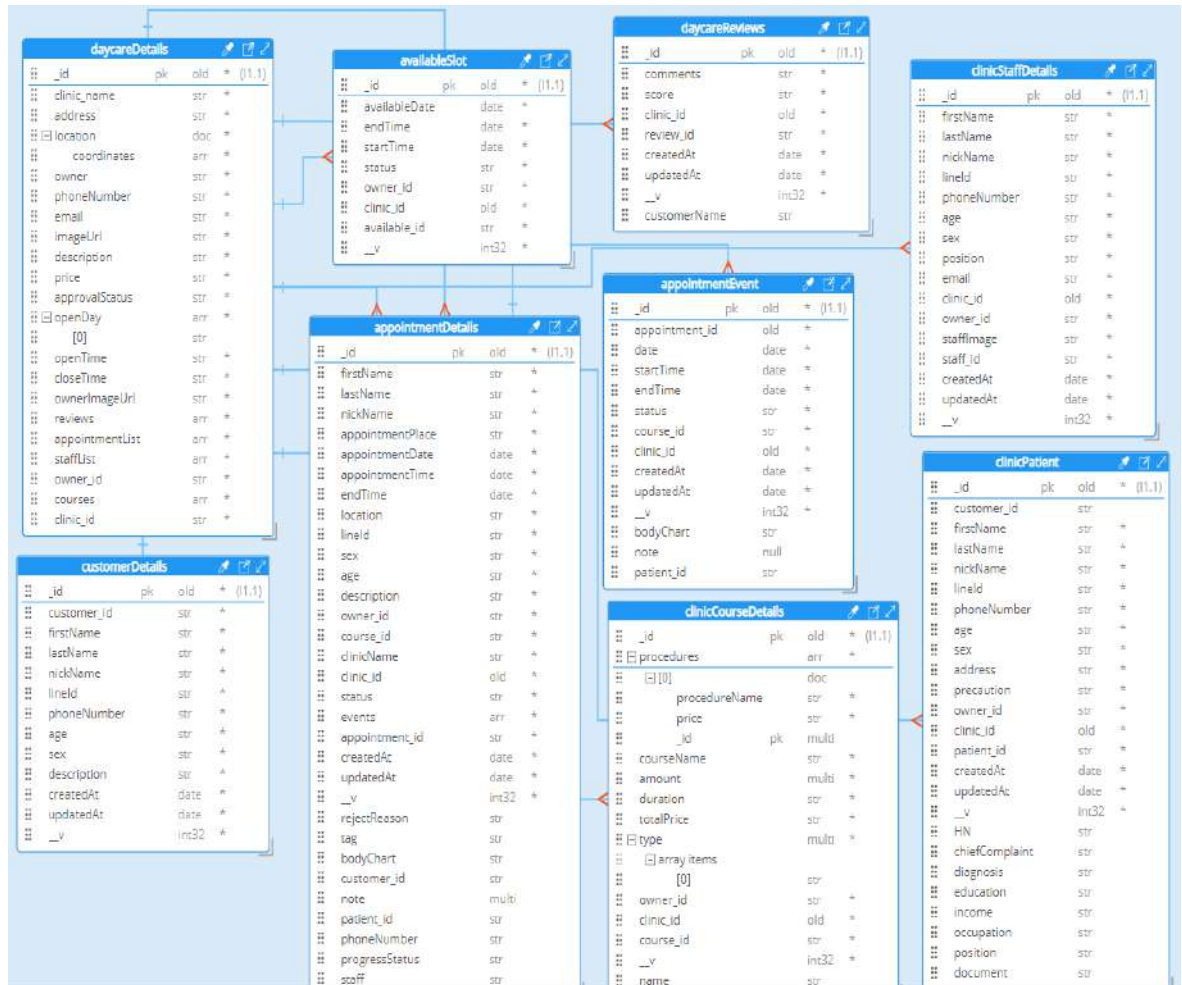


Figure 3.42: ER Diagram

Clinic Table

Example of clinic table which keep the clinic information in our database.

Field	Type	Man/Con	Key	Remark
id	string	M	PK	ObjectId
clinic_name	string	M		
address	string	M		
location	string	C		coordinates: []
phoneNumber	string	M		
owner	string	M		
email	string	M		• check must contain '@'
imageUrl	string	C		
description	string	C		
appointmentList	Array	C		
approvalStatus	string	C		default: "Unauthorized"
reviews	string	C		
openDay	string	C		
openTime	string	C		
closeTime	string	C		
ownerImageUrl	string	C		

Figure 3.43: Clinic table

Appointment Table

Example of appointment table which keep the appointment detail in our database.

Field	Type	Man/Con	Key	Remark
id	string	M	PK	ObjectId
customer_id	string	M		
nickName	string	C		
firstName	string	C		
lastName	string	C		
phoneNumber	string	C		
status	string	C		default: "pending"
clinic_id	objectId	M		
appointmentDate	Date	M		
appointmentTime	Date	M		
appointmentPlace	string	C		
lineId	string	C		
sex	string	C		
age	string	C		
description	string	C		
bodyChart	string	C		
note	string	C		
progressionStatus	string	C		
events	objectId	C		
patient_id	string	C		ref: "Patient"
staff	string	C		ref: "Staff"
course_id	string	M		ref: "Course"

Figure 3.44: Appointment table

Chapter 4

Experimentation and Results

4.1 Application Testing

This chapter explains the plan of application testing and testers recruitment plan to review, ensure the system working properly and product meets the requirement.

4.1.1 Testing Methodology

- System Integration test : Detect irregularity between units integrated together and the integrated and whole system with the corresponding requirement within the team.
- User acceptance test : Let the end users (customers/patients and physical therapy clinic's owner) test to verify the system.

Clinic

Test #1 - 17 Feb 23 deploy
Test #2 - 25 Feb 23 localhost
Test #3 - 1 Mar 23 deploy

TESTER	CASE	STATUS (17/02/2023)	STATUS (25/02/2023)	STATUS (01/03/23)	ISSUE	ASSIGN TO
Ayina - Clinic Owner [LINE]	1. login	PASS	PASS	PASS		
Dookdik - Clinic Owner [Google]	2. create daycare	PASS	PASS	FIX	picture size validation HYP-138 [HYP-138] Clinic picture size validation DONE	@WANISA POONGTHAISONG
	3. Navigate to course page	PASS	PASS	PASS		
	4. add course	PASS	PASS	PASS		
	5. Navigate to availability page	PASS	PASS	FIX	reduce padding top HYP-132 [HYP-132] Clinic availability page - reduce padding top DONE	@Pavinee Suthamjaem
	6. add availability slot	PASS	PASS	PASS		
	7. Navigate to patient	PASS	FIX	FIX	คลินิกไม่แสดง center HYP-135 [HYP-135] Clinic patient table view ไม่แสดง center DONE	@Pavinee Suthamjaem
	8. add patient in patient report	PASS	PASS	PASS		
	9. Navigate to staff	PASS	FIX	FIX	แสดง card ไม่แสดงชื่อแพทย์ HYP-140 [HYP-140] Clinic staff page แสดง text ไม่แสดงชื่อแพทย์ DONE	@Pavinee Suthamjaem
	10. add staff member in staff page	PASS	PASS	PASS		
DONLY ON SIT	11. Delete staff	PASS	PASS	PASS		
	12. Navigate to new request page	PASS	PASS	FIX	แสดง card ไม่แสดงชื่อแพทย์ HYP-141 [HYP-141] Clinic request page แสดง card ไม่แสดงชื่อแพทย์ DONE	@Pavinee Suthamjaem
	13. Click to see detail in request card - Request Modal	PASS	FIX	PASS		
	14. Accept request	PASS	PASS	PASS		
	15. Reject request	PASS	PASS	PASS		
	16. Navigate to 'All new requests' view	PASS	PASS	FIX	line id icon too large https://haspyreiders.assignment.net/browses/HYP-142 - Can't find link	@Pavinee Suthamjaem
	17. click at 'upcoming appointment'	PASS	FIX	FIX	schedule view - cannot add event form HYP-134 [HYP-134] Clinic schedule view - cannot add event form DONE	@WANISA POONGTHAISONG
	18. Click to see detail in request card - Appointment Modal	PASS	PASS	FIX	แสดง card ไม่แสดงชื่อแพทย์ HYP-143 [HYP-143] Clinic appointment modal - แสดง card ไม่แสดงชื่อแพทย์ DONE	@Pavinee Suthamjaem

Figure 4.1: Test Case

Figure 4.1 shows the table of test case contains the field of Tester, Case, Status, Issue, and Assign Issue which is the person who will response for the case if there is an issue. We plan the test by using user experience and user journey process define when and where the user is incline to interact with features through the interface in the application.

4.1.2 Evaluation

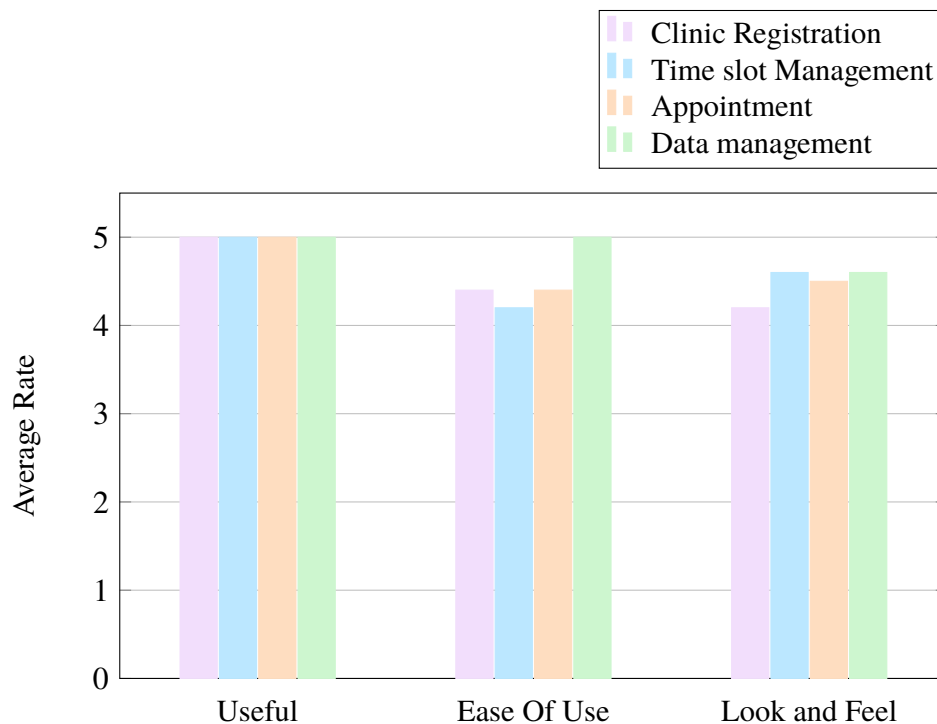
We conducted survey on user-based for test result. Candidates are college student at the faculty of engineering, people in general and one of the candidate is an independent physical therapist.

Participants were asked to rate score of overall outlook and each features in term of usefulness, ease of use, and applications interface.

4.1.3 Testing Results

By conducting a survey on user-based for testing results, participants were asked to rate score of overall outlook and each specific features in terms of usefulness, ease of use, and applications interface.

The results revealed that candidates were satisfy with the user-interface, and ultimately utilitarian. We inserted a visualize data result rating of main features as a group bar chart displayed below:



Application Test Result

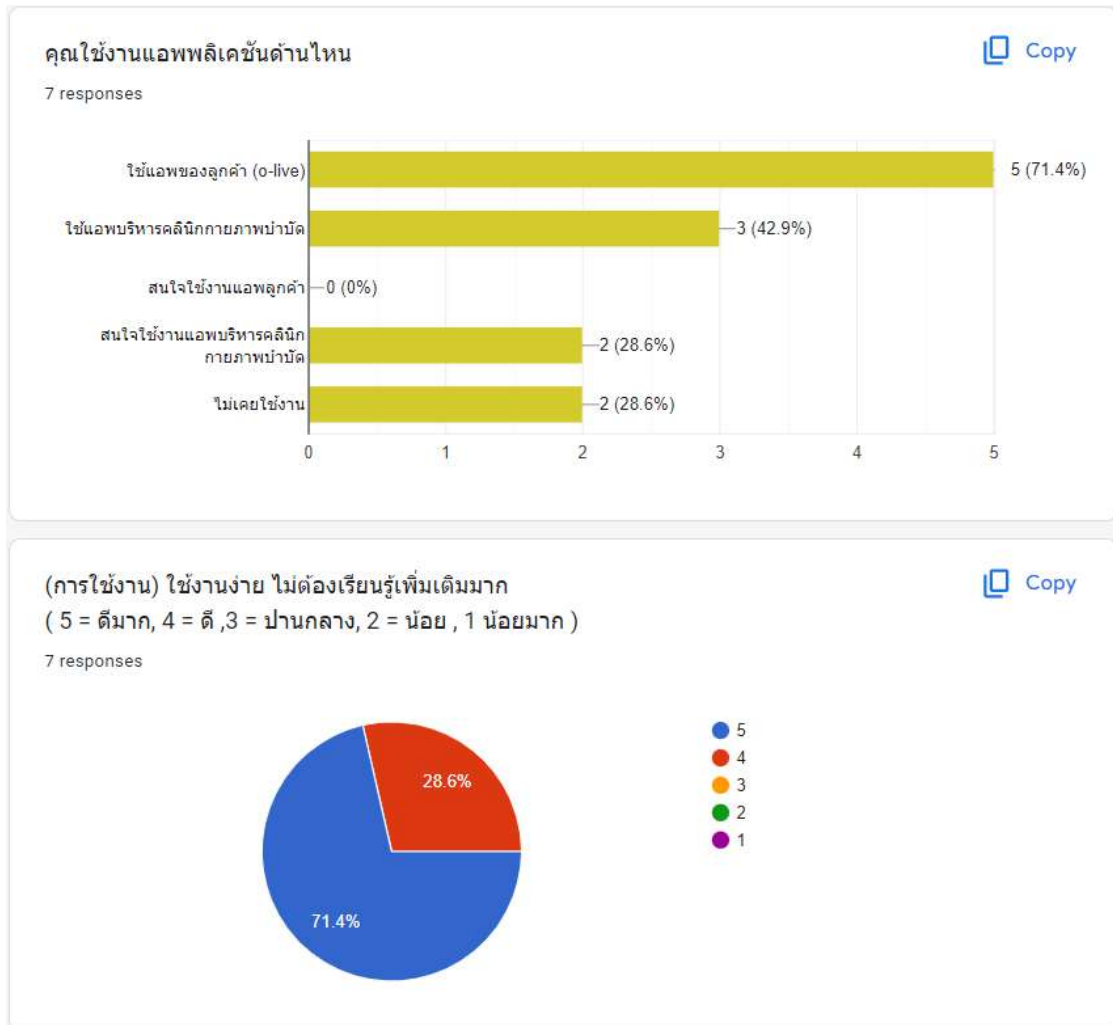
The test results and feedback conclusion in percent of the overview of this application displayed in the table below:

Table 4.1: An application overview test result.

	Usefulness	Ease of Use	Look and Feel	Total satisfaction
Very Good	100%	71.4%	57.1%	85.7%
Good	–	28.6%	42.9%	14.3%

4.1.4 Survey

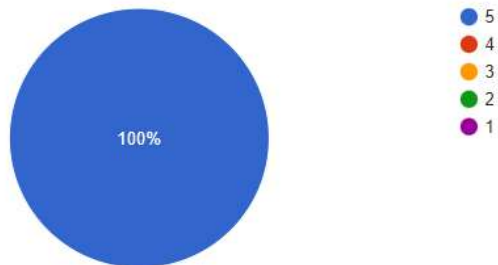
We gave 2 form of questionnaires to participants. The following images show type of the question and result of the surveys.



(ความสะดวก) สะดวกสบายขึ้นกว่าเดิม ลดภาระได้
(5 = ดีมาก, 4 = ดี, 3 = ปานกลาง, 2 = น้อย, 1 น้อยมาก)

 Copy

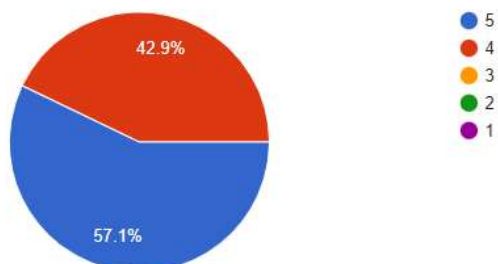
7 responses



(หน้าตาของแอป) สบายตา นำใช้งาน ทันสมัย
(5 = ดีมาก, 4 = ดี, 3 = ปานกลาง, 2 = น้อย, 1 น้อยมาก)

 Copy

7 responses



มีประโยชน์ ต้องการใช้ต่อ
(5 = ดีมาก, 4 = ดี, 3 = ปานกลาง, 2 = น้อย, 1 น้อยมาก)

 Copy

7 responses



สิ่งที่คุณชอบมากที่สุดเกี่ยวกับแอปพลิเคชัน

 Copy

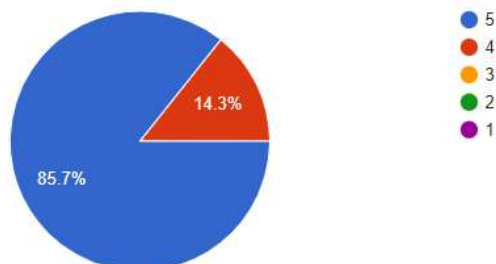
7 responses



คะแนนโดยรวม
(5 = ดีมาก, 4 = ดี, 3 = ปานกลาง, 2 = น้อย, 1 น้อยมาก)

 Copy

7 responses

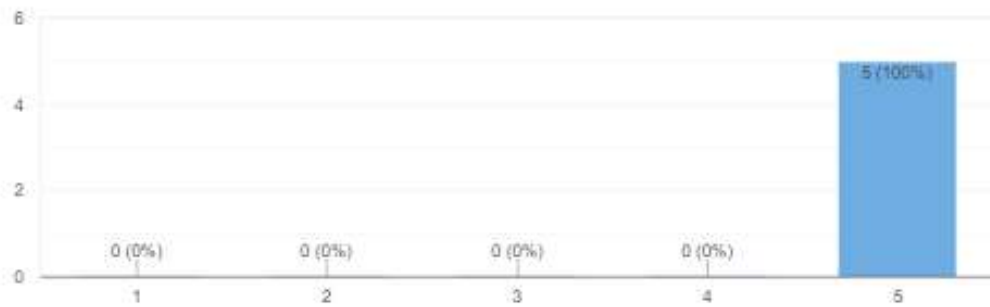


[Appointment Scheduling] การเพิ่มนัด ติดตามนัดหมายทั้งหมด, ที่กำลังมาถึง และเข้าถึงตารางนัดหมายของแต่ละนัด

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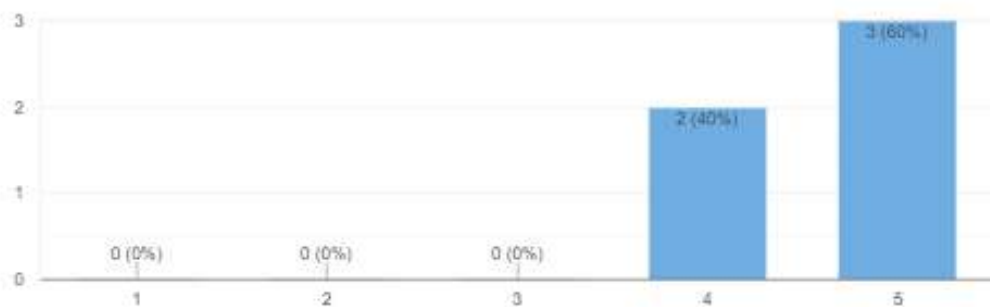
5 responses



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5 responses



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5 responses

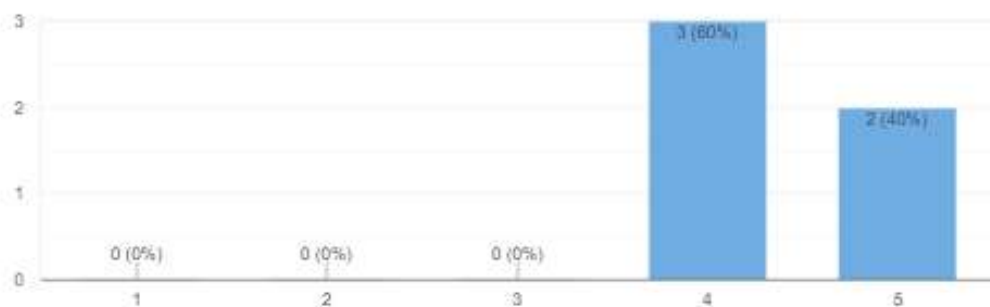


Figure 4.2: Appointment

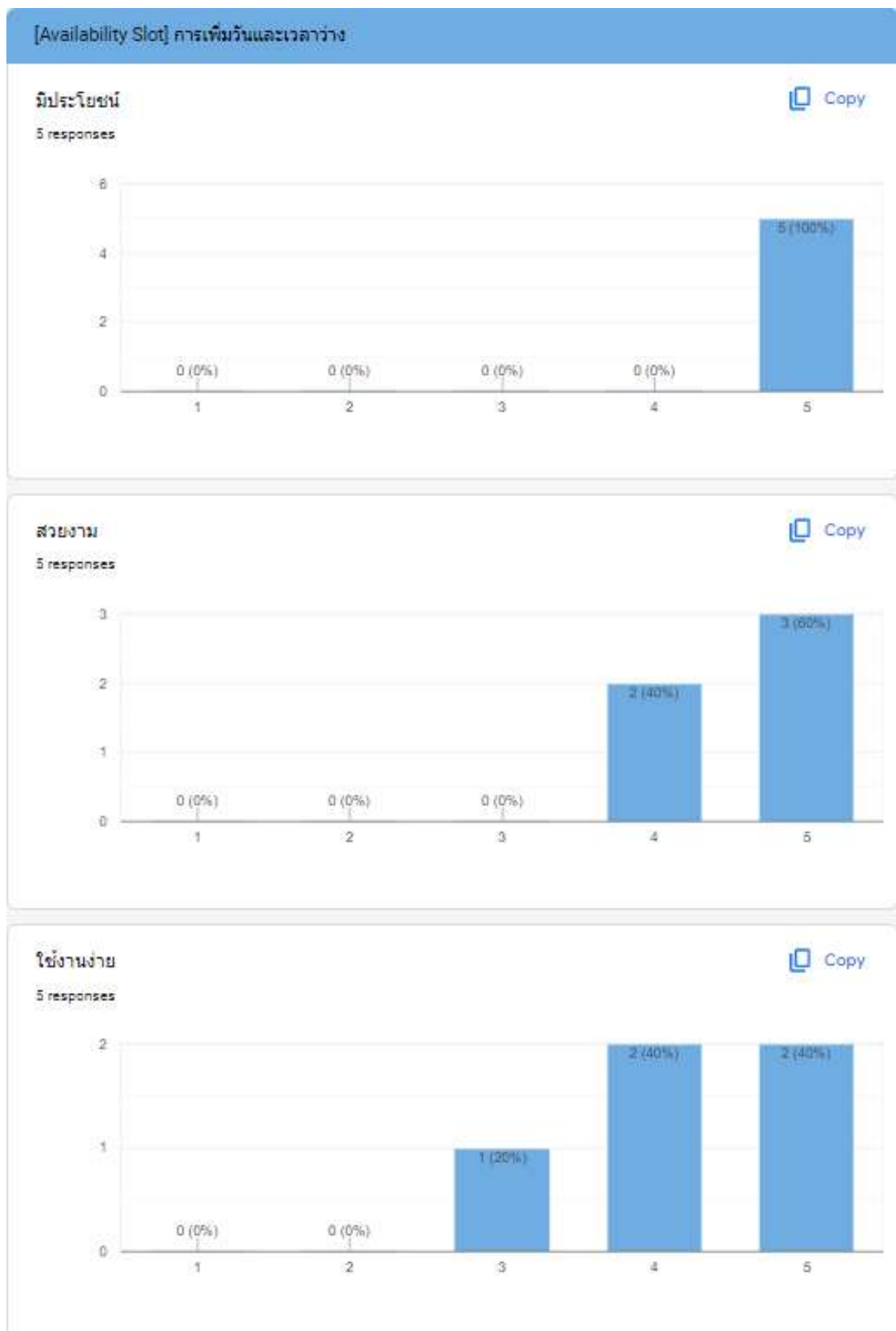


Figure 4.3: Time slot management

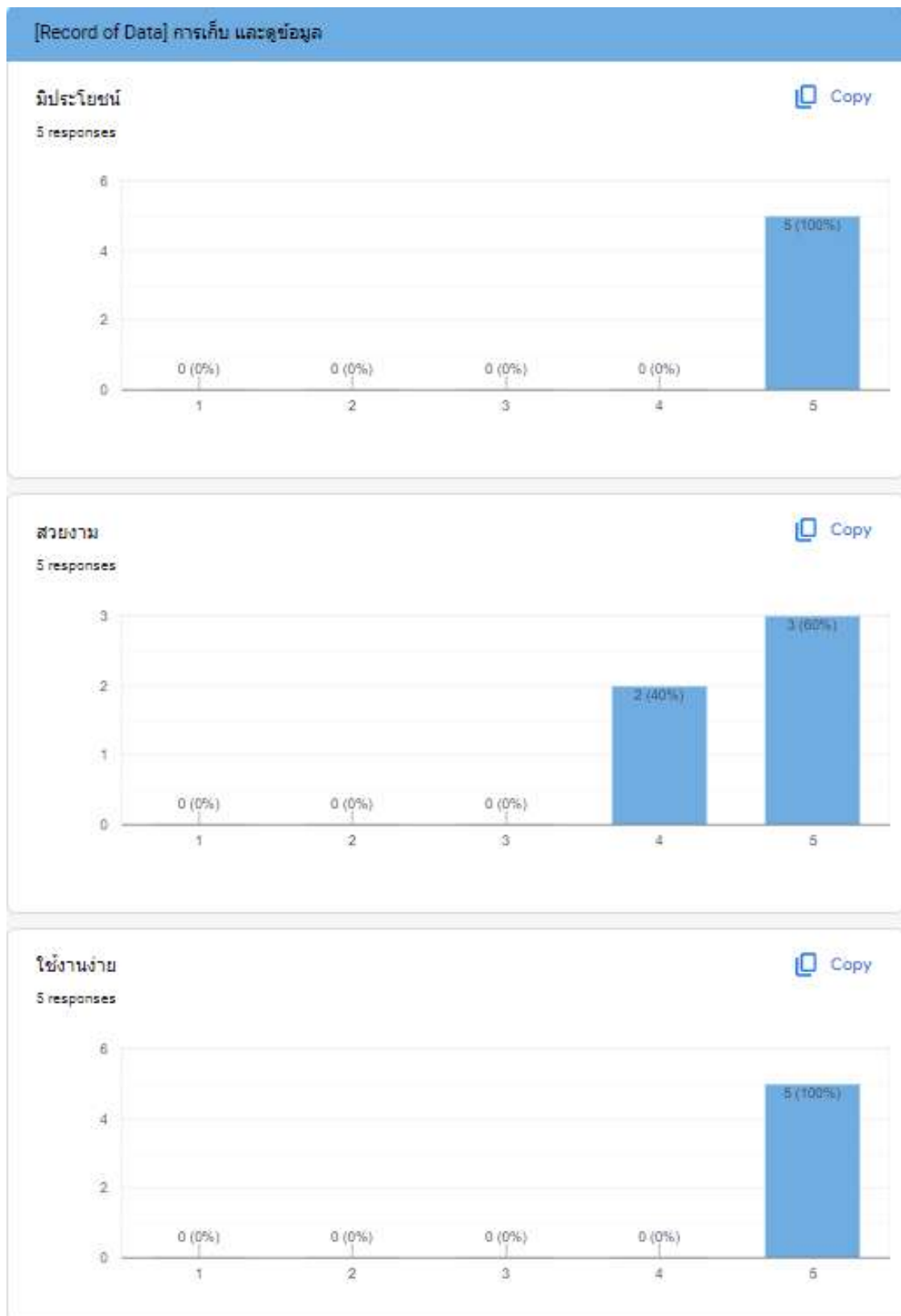


Figure 4.4: Data Management

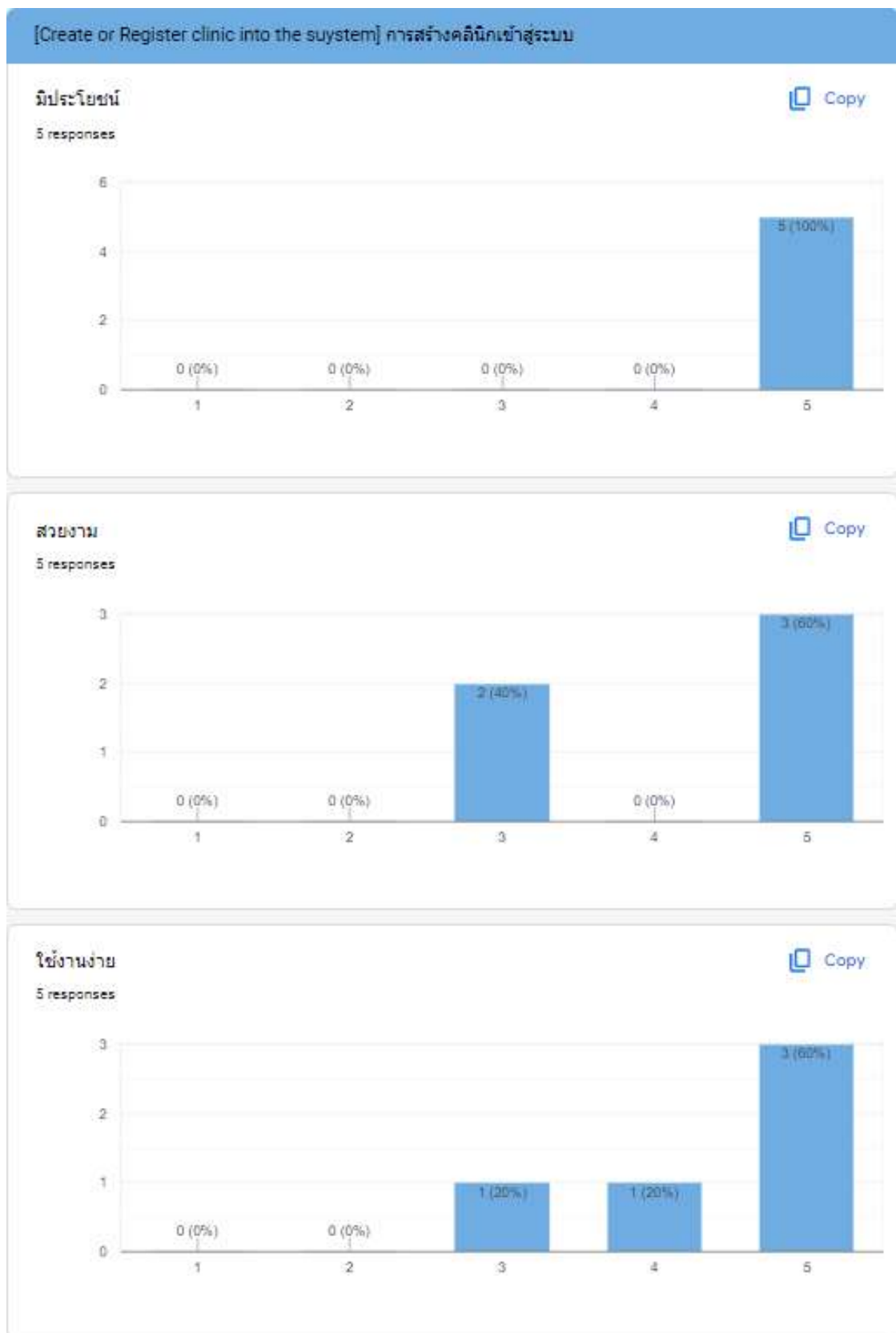


Figure 4.5: Clinic Registration

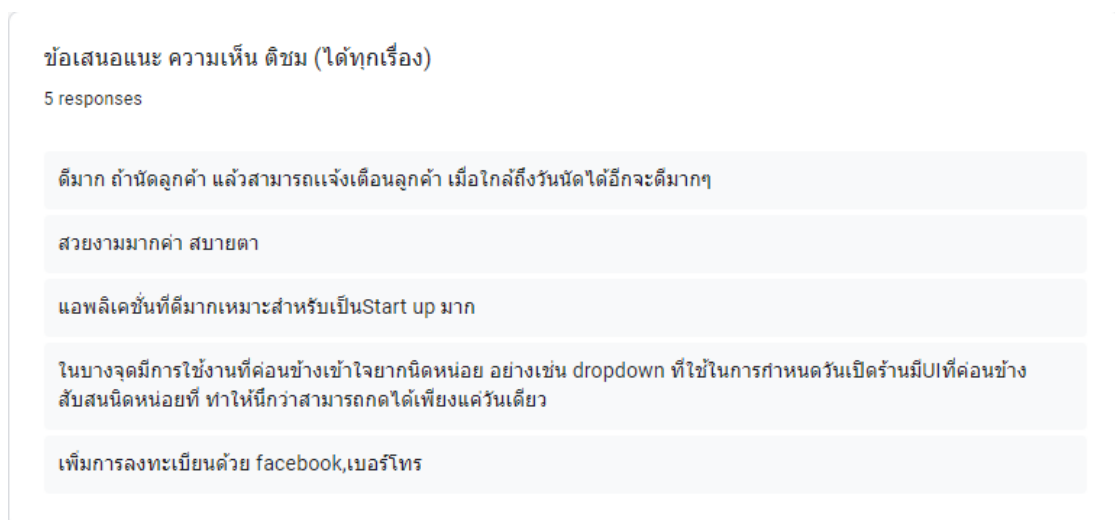


Figure 4.6: Written Reviews

Chapter 5

Conclusions and Discussions

5.1 Conclusions

This project aims to aid physical therapy clinics with online and efficient web application, web application platform to manage clinic information in one place which customers can as well as reserve an appointment by themselves with many clinics anywhere.

This project helps us understand real-world constraints such as collaborating with the client that convince us that there is much room for improvement.

Furthermore, we think that this project can be adapted to suit other similar businesses, for example, beauty clinics, and many more.

5.2 Challenges

Although, Participants were satisfy of user interface, and ultimately utilitarian. The test results and feedback convince us room for improvement, we found issues and potential solution of each issues displayed in the table below:

Feature	What We Found	Potential Solution
Clinic Registration	On create clinic form, when selecting opening days, it's not clear that use can select multiple days.	Use checkbox.
Appointment	On a calendar, user has to click at the day to know which day they have an appointment.	Put dot or some kind of indicator under the day in the calendar that has appointment.
Reservation	New customers are uncertain which courses they should reserve.	Categorize the service to pain section, or use tags to indicate which pain that the service help relieve, put description about the service.
Time slot	There is no alert for users if they are adding the time slot with the time that is already added.	Display alert box for user about the action.

5.3 Suggestions and further improvements

This platform has a potential to be continued develop and used by many business types that associate with appointment reserving for example, beauty clinics, nail clinics, hair salon, surgery clinics, and many more as a convenience toolkit, one-stop service application for customers to browse and make reservations, while allowing clinics to manage appointments, records, and customer information.

However, there is room for improvement to enhance the user experience and interface, with features that can be redesigned or improved.

The application needs significant development in terms of performance, source code organization, and readability for future contributions.

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Appendix A

Gallery appendix

A.1 Gallery



Figure A.1: User using application

Appendix B

Manual

The team created a **System Manual** that can be access by anyone to view clinic management system manual.

This manual is also available on our project web application.

In this manual:

- Login
- Reject and Accept Request
- Appointment Creation
- Patient Report
- Body chart and sub-appointment
- Appointment Completion



Figure B.1: Login, Clinic Registration, Course Management and Time slot Management

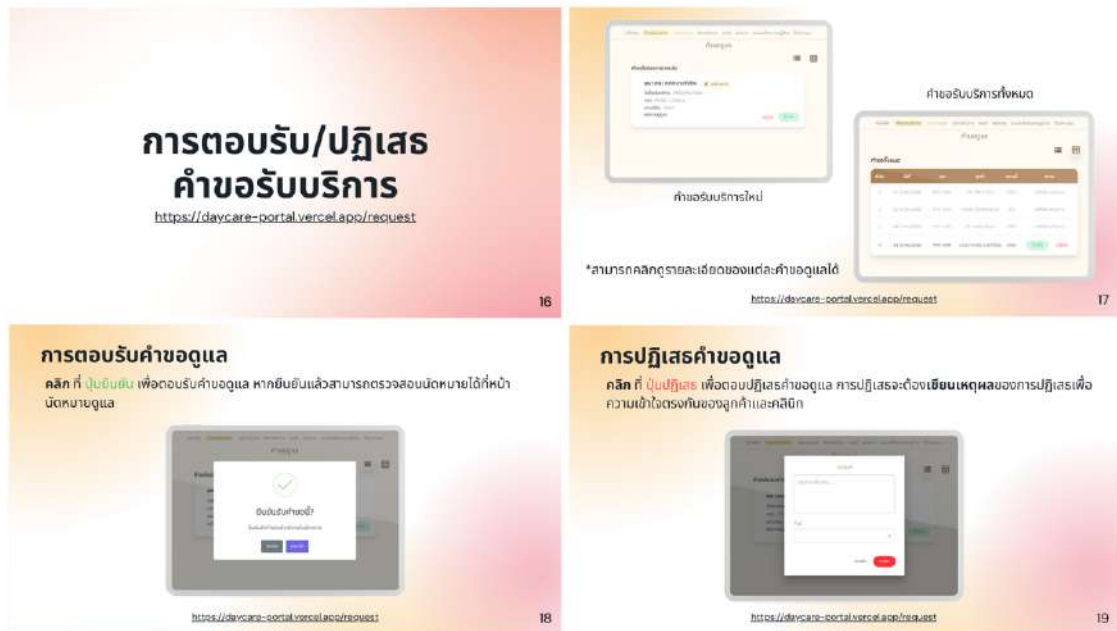


Figure B.2: Appointment Rejection and Accept



Figure B.3: Patient Report

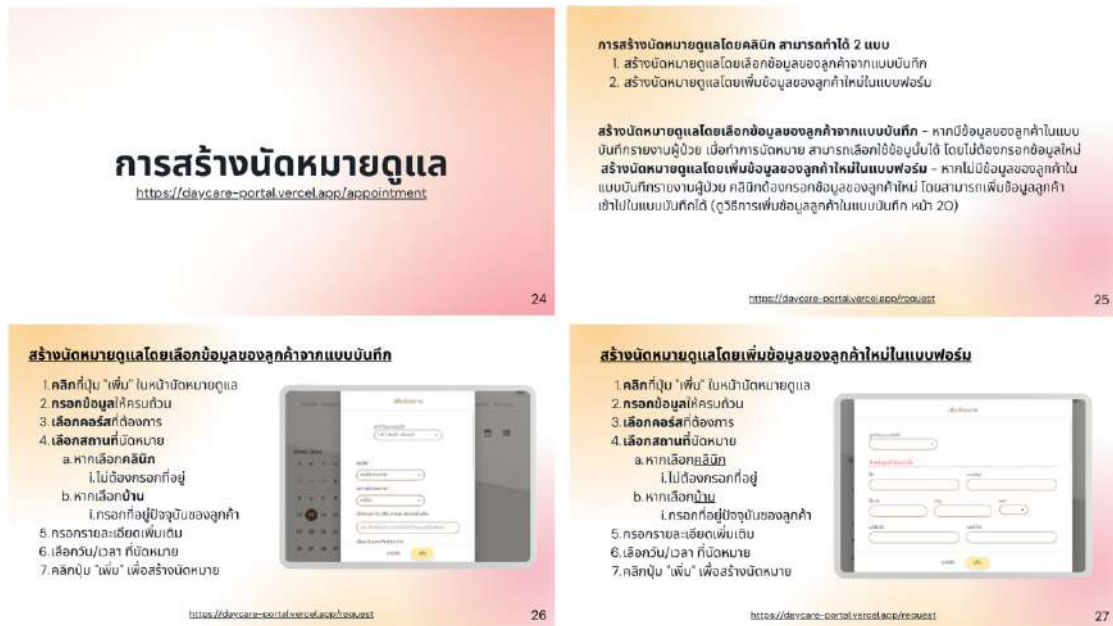


Figure B.4: Appointment Creation



Figure B.5: Body Chart and Sub-appointment



Figure B.6: Appointment Completion

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