AROUND MU

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A Term Project Submitted in Partial Fulfillment of the Requirements for

THE DEGREE OF BACHELOR OF SCIENCE (INFORMATION AND COMMUNICATION TECHNOLOGY)

Faculty of Information and Communication Technology
Mahidol University
2021

CONTENTS

Page

CHAPTER 1
INTRODUCTION

This chapter will introduce the basics of this project as the topic follows.

1.1 Motivation

According to the current situation, some people cannot come to the Salaya campus and are not familiar with the places around the campus. It will be difficult for them to find the necessary place such as dormitory, restaurant, etc due to the unfamiliar location.

1.2 Problem Statement

We want to solve the problem of someone who doesn't know about the place around Mahidol university well and wants to find a new place to go. Our system will recommend the interesting locations that are located near Mahidol university such as dormitory, restaurant, clinic, and drug store.

1.3 Objectives of the Project

- To find the places that are located near Mahidol University
- Easy to guide for the person who doesn’t familiar with the place
- No need to search for the location by each

1.4 Scope of the Project

The mobile application that can run on Android devices which will be implemented by Flutter cross-platform framework for mobile application development tool.

1.5 Expected Benefits

- Users can know the place that is near Mahidol University.
- Users can use the application to guide them to the place directly.
- Users can find the place easily.

1.6 Organization of the Document

This document consists of 6 chapters including:

1. Introduction – The chapter that introduces the including motivation, problem statement, objectives, scope, expected benefits, and the organization of the document of our project.
2. Background – The chapter that describes what we have studied.
3. Analysis and Design – The chapter that explains how we analyze and design this simple application.
4. Implementation – The chapter describes the method of how this application will be implemented.
5. Testing and Evaluation – The chapter describes how we test the application.
6. Conclusion – The chapter that explains the summary of our application and the whole project.

CHAPTER 2
BACKGROUND

2.1 Literature Review

Flutter

Flutter is the open-source framework by Google that is used for creating user interfaces for the mobile application on ios and android. Flutter uses Dart language that is similar to C# and Java to develop the application. Additionally, Flutter has a basic Widget that is convenient for designing the user interface, also Flutter's hot reload feature is comfortable for editing the code during running the application. [3] [4] [5]

Wongnai

Picture: https://www.studio7thailand.com/app-game/wongnaiapp/

Wongnai is Thailand's leading restaurant review platform that includes the user's content review on restaurant, beauty, price, and travel. It serves the outstanding services and contents on the platform by website and mobile application. Wongnai consists of 2 types of services that are O2O service for customers and POS service for restaurant owners. Moreover, Wongnai has more than 10 million users in the system, and also has the biggest restaurant database in Thailand. [1] [2]

Google Maps

Picture: https://pixabay.com/images/id-1797882/

Google Maps is a famous service related to location. It can show detail on each place several views such as 2D graphic, 2D satellite, 3D modes. There are many features that Google Maps provide such as place categories, a save list of places, GPS, finding the route and calculating distance, etc. [6]

Google Maps also has an API that allows third-party websites to embed maps, as well as a locator for businesses and other organizations in a lot of different countries. Therefore, we can see several services that related to the location will use API from Google Maps to be more convenient. [7]

CHAPTER 3
ANALYSIS AND DESIGN

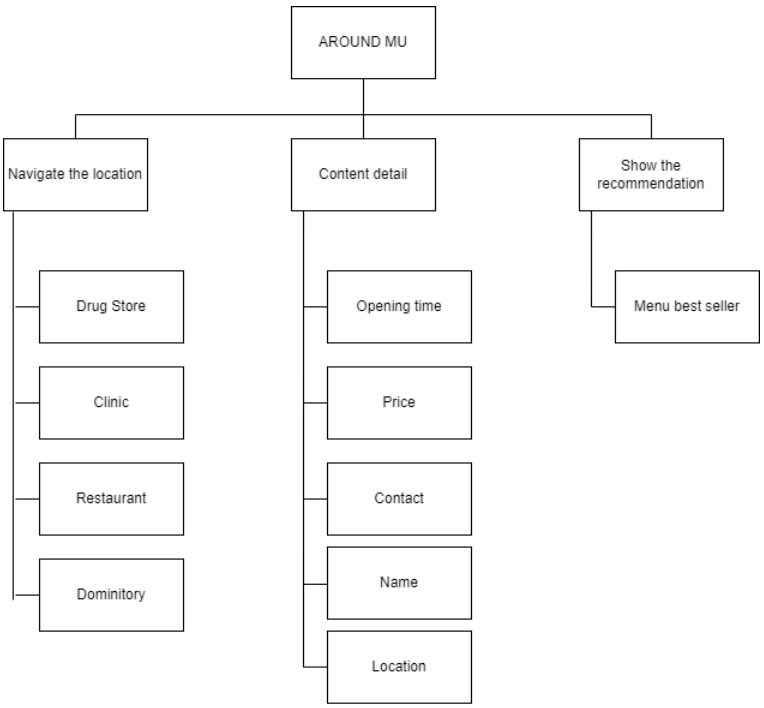
This chapter explains how we analyze and design this simple application.

3.1 System Architecture Overview

Our application focuses on the location around Mahidol University, Salaya Campus to guide someone who isn't familiar with the place. In the application, it will consist of the place such as dormitory, restaurant, clinic, and drug store, and contain the details of that location. For example, when the user wants to find dominitory, the system will show the map and some details about that dorm such as the room's price or opening time.

3.2 System Structure Chart

This chart shows the structure of our system briefly.



Project : AROUND MU **System :** AROUND MU	**Major Advisor :** Mr. Snit Sanghlao

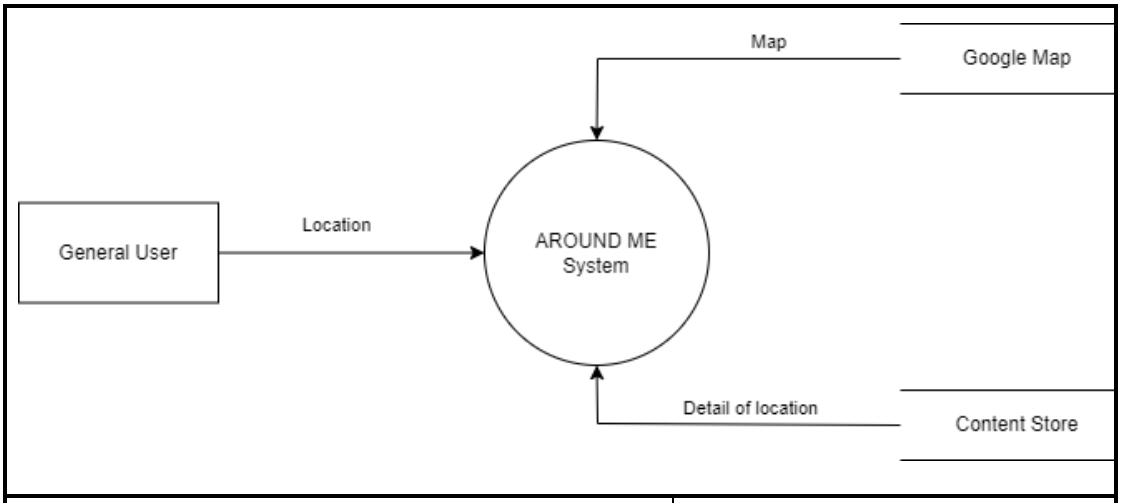
Description : The chart shows main contents that will be included in application.

Figure 3.1: System Structure Chart

3.3 Process Analysis and Design

3.3.1 Data Flow Diagram

This chart shows the data flow of system.



Project : AROUND MU **System :** AROUND MU	**Major Advisor :** Mr. Snit Sanghlao
Description : The chart shows data flow of system	

Figure 3.2: Data Flow Diagram

3.3.2 Data Dictionary

Entity	Attribute	Contents	Key	Sample
Place	PID	Place's ID	PK	p001
	TID	Type' ID	FK	t001
	Name	Place's name		Anya's Place
	Contact	Place's contact		0819395567
	Time	Place's office hours		10:00-17:00

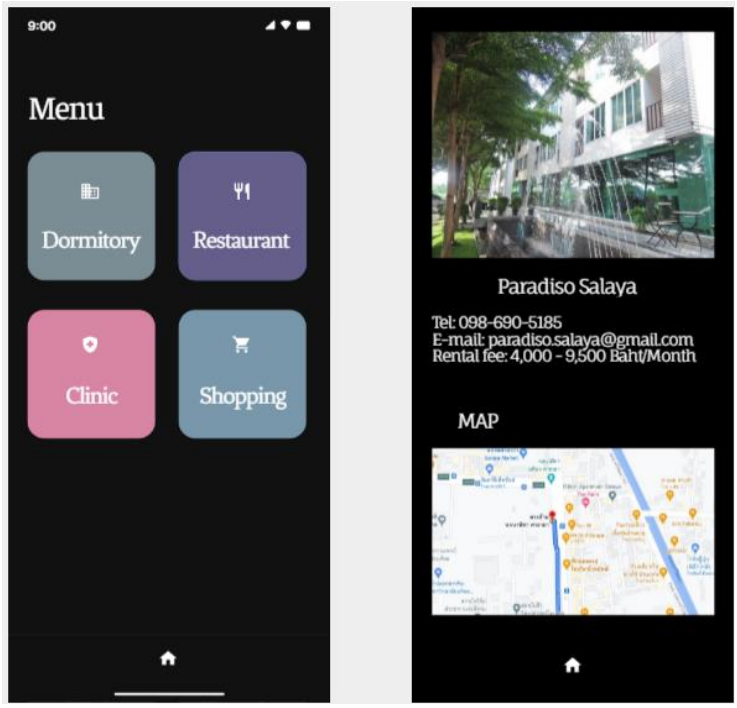
	Location	Place's Location		Riap Klong Tawee-Wattana Road Salaya, Phuttamonthon Sai 4
Type	TID	Type's ID	PK	t001
	TName	Type's name		Restaurant

3.4 I/O Design

This section explains the design of the Input and Output User Interface. The section consists of two parts, the interface design and the transition diagram showing transition through the system.

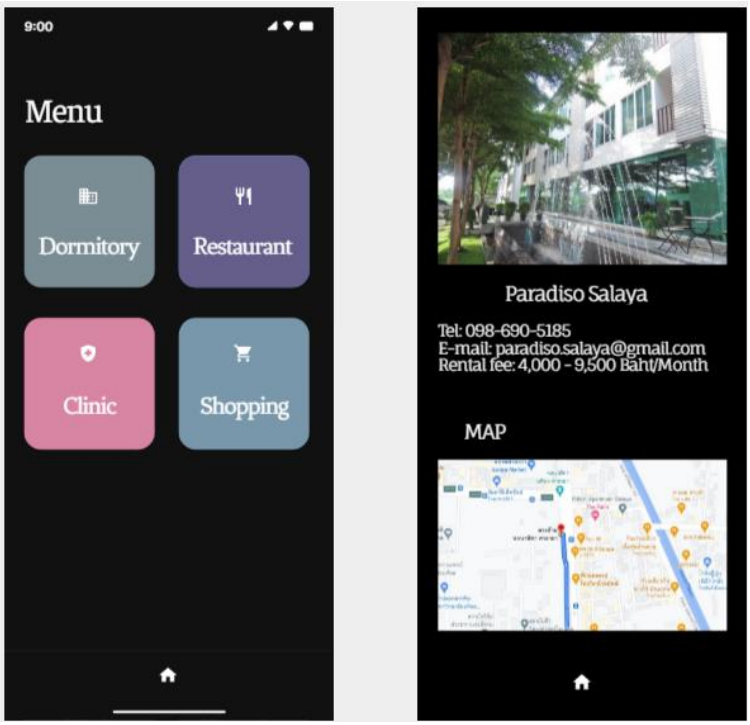
3.4.1 Interface Design

This is our AROUND MU application. On the main page, it will show the picture of MU tram and the 'Start' button to start using the application.



When the users click the ‘Start’ button, it will move to the Menu page that consists of the location around the Mahidol University, Salaya campus. We plan to include dormitories, restaurants, clinics, and shopping places.

For example, in the dormitory page, it will contain the dormitory around Mahidol University, Salaya campus.



When the users want to know about that place, they can click on the picture of that location. Then, it will move to a detail page that consists of the information about dormitory and map to guide the user to go.

3.4.2 **Transition Diagram**

This diagram shows how each page in application links to each other.

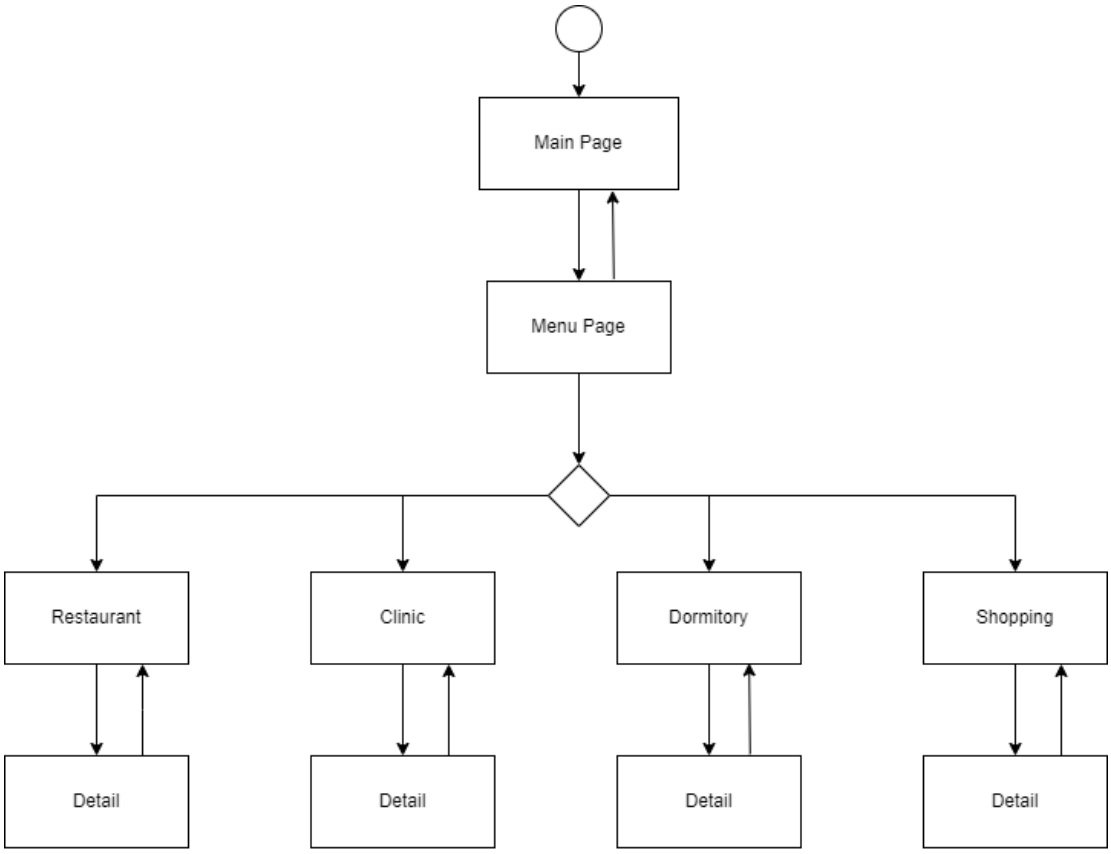


diagram showing transition through the system.

CHAPTER 4
IMPLEMENTATION

This chapter describes our implementation and some results of the application running.

4.1 Hardware and System Environment

- Operating System and Utilities Applications
    - Windows - Used for coding
    - Android - Used for running the application
- Web Server Software
    - Google Chrome - Used for testing the application
- Editor
    - Visual Studio Code – Used for coding and running the application
- Programming and Scripting Tools
    - Android Studio - Used for coding and running the application

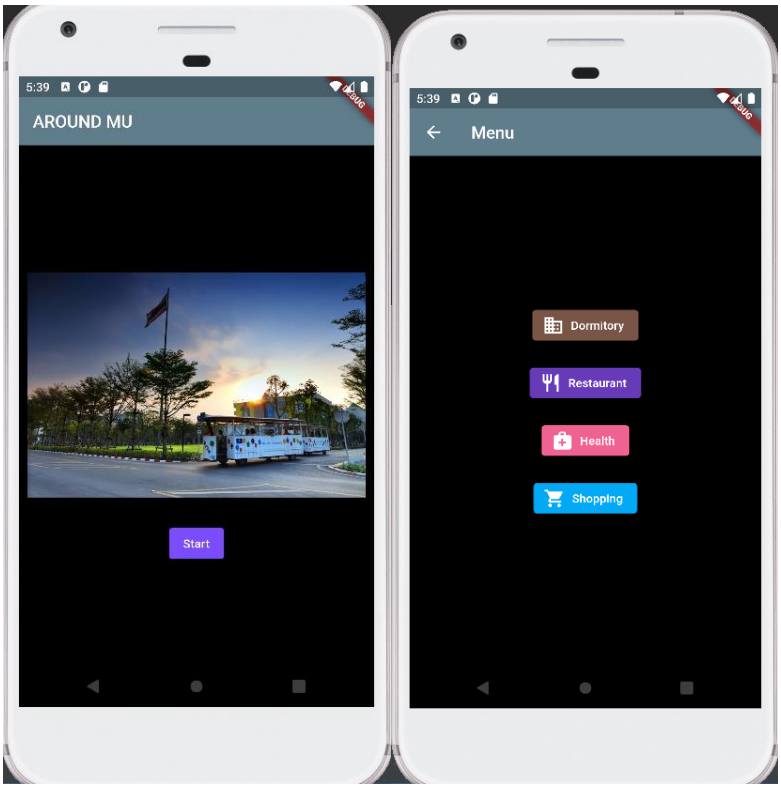
4.2 Implementation Guide and Techniques

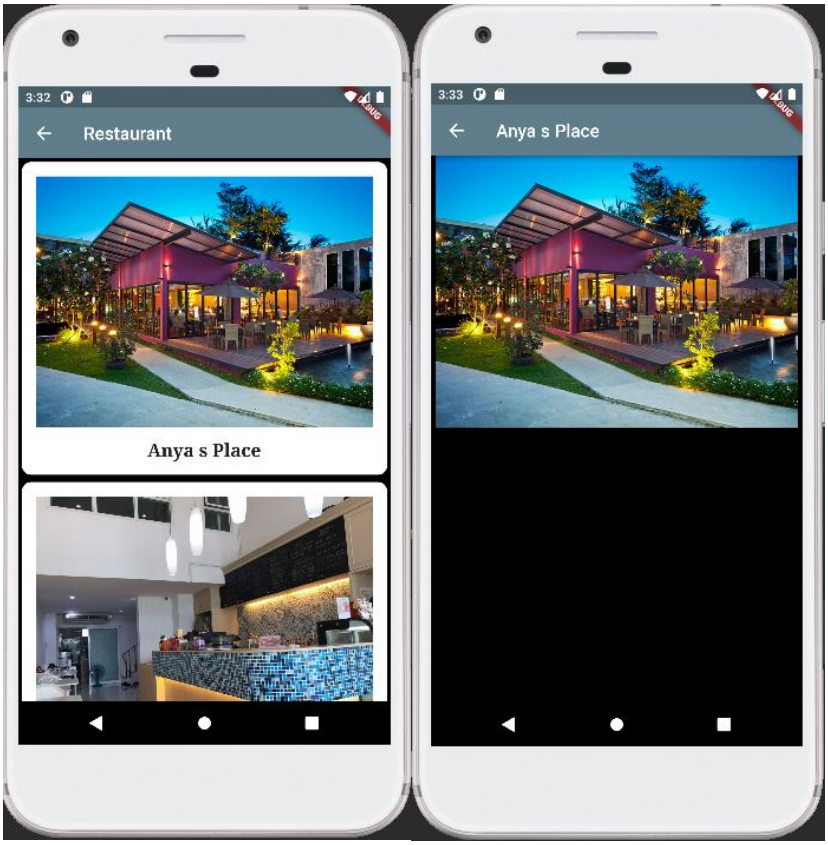
4.2.1 Navigate to the second route using Navigator.push()

We implement the code using the Navigator.push() method to navigate the user to another page in our application. This method will add a Route to the stack of routes managed by the Navigator. In this part, we navigate users from FirstRoute to SecondRoute.

```
class FirstRoute extends StatelessWidget {
  const FirstRoute({Key? key}) : super(key: key);

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(
        title: const Text('AROUND MU'),
      ),
      body: Center(
          child: Column(
              mainAxisSize: MainAxisSize.min,
              children: <Widget>[
                Padding(
                  padding: EdgeInsets.all(10.0), // Space
                  child: Image.asset('assets/images/tram10.jpg',
height: 300),
                ),
                ElevatedButton(
                    child: const Text('Start'),
                    onPressed: () {
                      // Pushing a route Direcly
                      Navigator.push(
                        context ,
                        MaterialPageRoute (builder :
                            (context) => const SecondRoute ()) ,
                      );
                    },
                    style: ElevatedButton.styleFrom(
                        primary: Colors.deepPurpleAccent) // Button
color
                ),
              ]
          )
      ),
    );
  }
}
```


5:39
AROUND MU
Start
5:39
Menu
Dormitory
Restaurant
Health
Shopping


3:32
Restaurant
Anya s Place
3:33
Anya s Place

4.2.2 **Card**

A card in Flutter is used to represent information and has rounded corners and is shadowed. We use the card in material design to create the list of locations in each menu such as the dormitory menu consisting of the list of dormitories around the Mahidol university, Salaya campus.

```
Widget buildDormCard(Dorm dorm) {
    return Card(
      // 1
      elevation: 2.0,
      // 2
      shape: RoundedRectangleBorder(
          borderRadius: BorderRadius.circular(10.0)),
      // 3
      child: Padding(
        padding: const EdgeInsets.all(16.0),
        // 4
        child: Column(
          children: <Widget>[
            Image(image: AssetImage(dorm.imageUrl)),
            // 5
            const SizedBox(
              height: 14.0,
            ),
            // 6
            Text(
              dorm.label,
              style: const TextStyle(
                fontSize: 20.0,
                fontWeight: FontWeight.w700,
                fontFamily: 'Palatino',
              ),
            )
          ],
        ),
      ),
    );
  }
```

CHAPTER 5
TESTING AND EVALUATION

This chapter describes the testing and evaluation process of our project.

5.1 Unit Tests

For the unit tests, we selected some important and critical processes for formal unit testing. The selected processes include:

- 1 Menu Page Routing
- 2 Detail Page Routing

5.1.1 Test Performed on 1 Menu Page Routing

Table 5.1: Menu Page Routing

Operation Performed	Condition Tested	Actual Result
Open AROUND MU app	User can open AROUND MU app	Pass
Go to main menu page	User can route to the menu page	Pass

5.1.2 Test Performed on 2 Detail Page Routing

Table 5.2: Detail Page Routing

Operation Performed	Condition Tested	Actual Result
Open AROUND MU app	User can open AROUND MU app	Pass
Open the main menu page	User can access the menu page	Pass
Go to each sub-menu page	User can access each sub-menu page	Pass
Go to detail page	User can see the detail of each place	Pass

See location via Google Map	User can see the location via Google Map	Fail

5.2 System Integration Test

This activity is performed after the system is completely integrated. The purpose of this testing is to check whether the system can operate correctly according to the required functions or not.

5.2.1 Test Scenario

In order to test all functional aspects of the system thoroughly, we had set up a test scenario which consisted of these phases as shown below.

- Menu Page Routing
- Detail Page Routing

Moreover, the test sce nario can be used as a user guideline because it covers all the steps necessary in order to use our system. The details of each phase are shown in the next section.

5.2.1.1 Menu Page Routing

- Open AROUND MU app
- Click Start on the Home page
- Access to Menu Page

5.2.1.2 Detail Page Routing

- Open AROUND MENU app
- Go to Menu page
- Go to each sub-menu page
- Go to the specific place
- See the detail for the selected place

CHAPTER 6
CONCLUSIONS

This chapter concludes our project with the benefits, the challenge and possibility of future improvement of our project.

6.1 Benefits

This project provides several benefits to developers, and users as follow.

6.1.1 Benefits to Project Developers

- We can know how the Flutter and Android Studio work basically.
- We can know more about the place around Mahidol university.
- We can learn more about UI design in Flutter.

6.1.2 Benefits to Users

- Users can get the information about the places near Mahidol University, Salaya Campus.
- Users can become familiar with the places easily.

6.2 Problems and Limitations

- Google Map API is quite difficult to apply.
- Flutter version didn’t support the application.
- Self-study in Flutter programming might not enough for doing the whole project.

6.3 Future Work

- The application can search the place by using input word.
- The application can access the other menu page by not going back to the main menu.
- This application can apply map service.

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