The University of Hong Kong
Department of Computer Science

COMP4801 Final Year Project

A Mobile Application to help the Elderly to avoid Telephone Deception

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Abstract

This report researches the mechanism to screen out scam calls for the elderly by the mobile application. In Hong Kong, telephone deception is discovered to be the most common scam for elderly, great amount of financial losses has been caused throughout these years. Therefore, the project provides a solution to avoid the elderly from telephone scams. An elderly-friendly android application with the features of incoming call screening with HKJunkCall API, and phone conversation screening by speech recognition, will be developed to screen out suspicious calls. The project is currently on schedule, an Android application with different functionalities has been developed, along with the potential challenges that will be demonstrated in the report. Synchronization of the database with the data from HKJunkCall, as well as the development of the function of phone conversation transcription and screening and other features are planned to be done by the next phrase.
Acknowledgement

I would like to express my sincere gratitude to Dr. T.W. Chim from the Department of Computer Science for supervising me throughout the final year project.

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# Table of Content

Abstract ................................................... I

Acknowledgements ....................................... II

List of Figures ............................................... V

List of Tables ............................................... V

Abbreviations ............................................. VI

1. Introduction ............................................ 1

   1.1 Background ......................................... 1

      1.1.1 Current Situation .......................... 1

      1.1.2 Existing Applications .................... 1

      1.1.3 Project Overview ........................... 1

   1.2 Motivation .......................................... 2

      1.2.1 Safeguard the Interests of the Elderly .... 2

      1.2.2 Offer Technical Supports for the Elderly to Adapt the E-generation .... 2

      1.2.3 Work as Deterrent to the Malpractice .. 3

   1.3 Objectives .......................................... 3

   1.4 Report Outline .................................... 3

2. Methodology ........................................... 4

   2.1 IDE and Language ................................ 4

   2.2 UI/UX design ...................................... 4

   2.3 Database of Suspicious Calls .................. 5

   2.4 System Design .................................... 6

   2.5 Incoming Call Screening and Updating ....... 7

   2.6 Transcription and Screening on Phone Conversation ....... 8

   2.7 Phone Call Reporting System ................. 9
2.8 Call Searching and Log 10
2.9 Regular Reminder to Avoid Telephone Deception 10
2.10 Summary 10

3. Progress and Discussion 11
3.1 Search Screen 11
3.2 History Screen 11
3.3 Report Screen 12
3.4 Incoming Call Screening 13
3.5 Potential Challenges and Mitigations 14
3.6 Summary 14

4. Future Plan 15

5. Conclusion 18

References 19
List of Figures

Figure 1.1 – Icon of Sieve 2
Figure 2.1 – Example of UI with large font size 4
Figure 2.2 – Example of different contrast ratio 4
Figure 2.3 – Current UI of Sieve 5
Figure 2.4 – The entity-relationship diagram of database 6
Figure 2.5 – System design of the project 6
Figure 2.6 – Information extracted by web scraping 8
Figure 2.7 – Alert with call information when there is incoming call 8
Figure 3.1 – Call searching function in Search screen 11
Figure 3.2 – Call log 12
Figure 3.3 – Redirecting to Report screen when the report button is clicked 12
Figure 3.4 – Call reporting function in Report screen 13
Figure 3.5 – Alert to display the information of the incoming call 13

List of Tables

Table 4.1 – Project schedule 15
Abbreviations

API  Application Programming Interface
IDE  Integrated development environment
UI   User Interface
UX   User Experience
1. Introduction

The following chapter introduces the background, motivation as well as objectives of the project, followed by the outline of the remaining part of the report.

1.1 Background

1.1.1 Current Situation

Under the coronavirus pandemic, phone scams in Hong Kong have been on an upward trajectory. There were 1,193 cases in 2020, which has been increased by 80 percent from 2019. It has resulted in a cumulative loss of $93 million in 2019 and 2020. In the first quarter of 2021, 200 phone scams were recorded and have resulted in a total of $45 million of financial losses [1]. The most common methods of operation utilized by scammers were to pretend officials, asking victims to guess who he or she is and transfer them money [2]. While the elderly are always the most common targets for telephone deception, cumulative financial losses are reported nearly $100 million, with each losing about $380,000 on average as at 2020 [3]. Based on the above statistics, it is found that the problem of telephone deception is serious among the elderly in Hong Kong.

1.1.2 Existing Applications

Regarding the problem of phone scamming, different mobile applications and websites have been launched to address this problem. Android application Call Defender and iOS application Jima Caller ID are popular mobile applications to filter out, identify and block the scam calls[4][5]. The applications are connected to HKJunkCall, a website providing information of suspicious calls, and the database of HKJunkCall will be updated by the applications with newly discovered suspicious phone number by calling the API, which is a developed function provided by HKJunkCall to check if the number is suspicious [6]. Although these applications seem to be efficient in avoiding telephone deception, the number of telephone deception cases is still rising.

1.1.3 Project Overview

In light of the trend of telephone deception cases that happened on the elderly and the imperfection of the existing applications, we are going to develop an elderly-friendly Android mobile application, Sieve (篩)Call), which is designed to screen out scam calls thoroughly.
Sieve will be delivered in Traditional Chinese. It is the enhanced version of Call Defender, acting as a sieve for screening the call by checking the database of suspicious calls with the help of HKJunkCall API [7]. It will also screen out and identify the sensitive and suspicious information during the phone call by speech recognition, thus sending out warning to the users. In addition, call searching feature and call log of unsaved calls with information extracted from database will be provided, together with the regular reminders for the elderly to avoid telephone deception will be pop-up from time to time as notification.

![Figure 1.1 – Icon of Sieve](image)

1.2 Motivation

1.2.1 Safeguard the Interests of the Elderly

The major momentum to launch such an app is stemmed from the social responsibility for safeguarding the properties of the elderly. Given that seldom have some of them been promoted or educated about the tactics of phone frauds, their savings can be easily deprived due to sympathy and lack of alertness. Tragedies are not uncommon, a 90-year-old woman was deceived with the loss of HK$250 million by a phone scam, claiming himself as a mainland official [8]. It is aimed that the app can act as a barrier to protect the interests of the elderly, as well as prevent their sympathy and carelessness from being manipulated.

1.2.2 Offer Technical Supports for the Elderly to Adapt the E-generation

Another trigger to devise this app is since the elderly are losing track during the digitalized generation. Often, the majority are lacking sufficient knowledge of how outlaws utilize technological tools for scams, resulting in falling prey to the deceptions. Similar to the case with the 90-year-old victim, bulk bogus massages or recordings can be sent to the phones [8]. Thus, it is envisaged that the elderly can be equipped with more experience in using the app for combatting crimes and be vigilant with the aid of advanced technologies. The app is hoped to embrace their generations with technological supports.
1.2.3 Work as Deterrent to the Malpractice

The app is also hoped to arouse awareness on the severity brought by phone deception, as well as present as a warning to deter the outlaws from committing such misconduct. With this idea, it is motivated to design the app with the function to alert the elderly once sensitive wordings have been received during the phone call. Also, the suspected phone numbers will keep sharing with the public, which will be likely to reduce the occurrence of such frauds and maintain social harmony, as it may be harder for the criminals to persuade the elderly in the presence of the reminders from the app.

1.3 Objectives

This project aims to build a mobile application to help the elderly to avoid telephone deception. The objectives of this project are listed below.

1. To enhance the feature of the Call Defender
2. To provide an elderly friendly UI UX
3. To create a database for storing suspicious calls
4. To scan the incoming calls from database
5. To parse and scrap data on HKJunkCall with the help of its API
6. To scan suspicious content on phone conversation by the speech recognition feature
7. To allow users to report the scam calls and update the database
8. To allow users to search and get the information from previous unknown call
9. To send regular reminder of tips in avoiding telephone deception

The scope of the project involves four major parts, a function to scan the suspicious calls from the database and give out warnings, the speech recognition feature to scan suspicious content in the phone conversation at near real-time, the phone call reporting system for users to report the scam calls as well as call searching and log tracking.

1.4 Report Outline

The remainder of the report is organized into three parts: Chapter 2 discusses the methodology and approaches of the project. Chapter 3 presents the current progress of the project, demonstrating what have been done so far. Potential challenges and mitigations are also included. The future plan with the project schedule will be illustrated in Chapter 4. Last but not least, Chapter 5 summarizes the interim report.
2. Methodology

The following chapter discusses the approaches of the project, including the implementation detail and technique to be used. The major features and the workflow of the project will be introduced.

2.1 IDE and Language

React Native will be used as the IDE for the application development as there are sufficient packages for building the application, as well as it is fast and easy to operate [9]. JavaScript will be the main language used for frontend development [10]. While Azure Function will be used to host the function of phone call information parsing and scrapping with HKJunkCall API, since they are easy to maintain and user-friendly with different built-in features that help facilitate the development process [11]. Python will be used for the development as it is applicable in data parsing and scrapping [12] [13].

2.2 UI/UX Design

Design platform Figma has been used for UI/UX design since it provides various design ideas and templates. As the application is tailor-made for the elderly, accessibility will be one of the main focuses of the UI/UX design. Research and interviews have been done to investigate the needs of the elderly user.

As shown in the example in Fig. 2.1, the text size will be large enough to make it clear to read together with a line spacing of at least 1.5 [14]. Especially when the elderly is much less eager to perform multi-finger gestures, gesture controls will be implemented with care, such as “pinch to zoom” will not be needed with the large text size [15]. At least 20 percent of the
elderly in Hong Kong are suffering from vision loss each year, for the sake of visual disability, the contrast ratio will be at least 5.5:1 (see Fig. 2.2) [16] [17]. The UI and content will stay simple and precise. Assuming most elderly read and speak Chinese, for their convenience, content is provided in Chinese.

![Figure 2.3 – Current UI of Sieve](image)

**Figure 2.3**– Current UI of Sieve

Fig. 2.3 shows the current UI of Sieve, different elderly-friendly feature such as larger font size, direct and simple navigation as well as high contrast ratio has been implemented. It consists of three screens i.e. Search (see Fig. 2.3(a)), History (see Fig. 2.3(b)) and Report (see Fig. 2.3(c)). The needs of typing have also been minimized, only two mandatory field are required to fill and dropdown picker are used for call reporting to reduce the input error. The detailed functionality of the screens will be discussed and justified in the later sections.

### 2.3 Database of Suspicious Calls

A database to store the scam calls will be developed to scan if the incoming call is suspicious. The data collection of the scam calls will be conducted with the help of the HKJunkCall API in the process of regular database synchronisation, incoming call screening (see section 2.5), phone conversations scanning by speech recognition (see section 2.6), as well as the suspicious calls reported by the users (see section 2.7). Firebase by Google are used as the database since it is a real-time database which allow syncing the real-time data across all devices [18]. It is a
database structured in JSON tree which is free of charge and easy to maintain. Fig. 2.4 shows the entity relationship of the database. There is only one object “Phone”, with child “PhoneNumber”, “Organization”, “Description” and “ReportTime”, which stores the phone number, organization, description of the call as well as the time when the call is being reported respectively. The child “PhoneNumber” is the primary key of the database. Since the call will be identified as either telemarketing or suspected scam, the IS-A relationship is applied to the diagram, which is to distinguish the category of the phone call.

Figure 2.4 – The entity-relationship diagram of database

2.4 System Design

The project aims to develop an end-to-end solution, which the application will help the elderly users to screen out suspicious calls and give out warnings to the elderly. Referring to Fig. 2.5 below, the workflow of the mobile application for screening out scam calls.

Figure 2.5 – System design of the project
The solution consists of three main parts: (a) incoming call screening and updating, (b) transcription and screening on phone conversation, and (c) phone call reporting system. They are represented in orange, blue and green respectively in Fig. 2.5. As shown in Fig. 2.5(a), when an incoming call is received, the number will be checked if it is a saved contact in the user’s contact list, if yes, the database of scam calls will be inspected to see if the number has been recorded previously. While if the number has been found suspicious from the database, a warning will be given. However, if there are no records of the number found in the database, web scrapping by Azure Function will be performed with the help of HKJunkCall API to check if the number is suspicious, getting the information of the call as well as updating the database if there is any. A warning will be given immediately if there is any information got from HKJunkCall API. The technology used will be discussed in section 2.5.

When the call begins, there will be transcription from speech to text at near real-time on the phone conversation as shown in Fig. 2.5(b). Phone call will be recorded in every 10 seconds, each recording will be transcribed at near real-time, and keywords scanning will be performed such as scanning if the content contains the branch code of the bank, to see if there is suspicious content during the call. A warning will be sent and the database will be updated if there is any. The detail will be explained in section 2.6.

Lastly, users are allowed to report for the number if they think that the number is suspicious after the call. As shown in Fig. 2.5(c), the database will be updated with suspicious calls reported by the users. The techniques used will be discussed in detail in section 2.7.

2.5 Incoming Call Screening and Updating

Screening will be performed and alert including the information of the call will be pop up whenever there is any incoming call. The function will first extract the number of the call by CallDetection module from ‘react-native-call-detection’ with permission READ_PHONE_STATE [19]. No alert will be displayed if it is from a saved contact. If it is an unknown call, checking will be performed to see if the call has been recorded in the database, data will be extracted from the database if there is any. Otherwise, checking and data scrapping with HKJunkCall API will be performed.
A GET API written in Python for parsing and scrapping the information of the incoming call with HKJunkCall API will be developed and hosted on Azure Function. The function may then be called with parameter `number`, information of the incoming call will then be returned if there is any. To parse the data with HKJunkCall API, instead of Python library Requests, Selenium will be used as web parsing with Requests will be blocked by the captcha after twenty trials [20]. While Selenium is parsing tool which control web browsers, perform browser automation and simulate browsing activity, the automation will be less likely to be detected and blocked by captcha [21]. Parsing will be performed on the HKJunkCall API i.e. https://hkjunkcall.com/?ft={number}, the information of the number will be returned in an HTML file. Python library BeautifulSoup4 will then be used to perform web scrapping for the tag `<title>`, thus getting the information of the call (see Fig. 2.6) [22].

![Figure 2.6 – Information extracted by web scraping](image)

**Figure 2.6 – Information extracted by web scraping**

If incoming call has been discovered as suspicious by the API, the database will be updated. After all, by ConnectionService on Android and RNCallKeep.displayInocmingCall() function from ‘react-native-callkeep’, if the call is identified as suspicious, an alert with the information of the call will be pop up immediately as shown in Fig. 2.7 [23][24].

![Figure 2.7 – Alert with call information when there is incoming call](image)

**Figure 2.7 – Alert with call information when there is incoming call**

To enhance the features of existing applications for avoiding telephone deception, we aim not just to screen out scam calls based on the API from HKJunkCall. A function of speech
recognition for transcribing phone conversation at near real-time will be implemented to screen out suspicious information during the call. For security purposes, it will be performed on the client side of the application. The phone conversation will be recorded in every 10 seconds by using the SoundRecorder module from ‘react-native-sound-recorder’ package with permission RECORD_AUDIO [25]. Each audio will be passed to perform the speech recognition and transcription by ‘react-native-voice’ package, as it provides accurate transcription in Cantonese [26]. After transcribing the speech into text, conversation scanning against sensitive information e.g. bank account information, will be performed. Warnings will be delivered in the form of notification with sound and vibration when there is sensitive information detected. The entire process will be performed at near real-time during the phone call. After the end of the call, an alert dialog will be pop up to ask if the call just made is suspicious, thus eliminating to store recording of unsaved known user. If the call is confirmed to be suspicious, the recording of the phone conversation will be kept for three days, and available to be downloaded in the call log (see section 2.8). The database will be automatically updated as suspected scam with the information scanned during the call if there is any. Otherwise, redirect to the call reporting system of the application.

2.7 Phone Call Reporting System

Users are also encouraged to report the call if they think that is suspicious after the call. There will be a form with different field such as phone number, category, organisation, description for user to report. As interviewed with the elderly, most of them prefer knowing only whether the number is suspicious or not, relatively less interest on knowing the organisation and the reasons why it is a scam. Therefore, in order to reduce the complexity, there are only two mandatory fields for the user to input, which is “Phone Number” and “Category”. In addition, to reduce the input error, there will be a dropdown list for user to pick the corresponding category i.e. telemarketing or suspected scam, under the “Category” field. As it will be demanding for the elderly to type the reasons why it is suspicious. Various choices of reasons like “Hang up after a ring” or “Ask for money transfer”, will be available for choosing in the “Type” field, and user may also choose the business type in the “Business” field. The temporary UI of the form may be referred in Fig. 2.3(c) in section 2.2. The choices will also be listed in a drop-down list for users to choose and submit. Users may also input the additional information or the reasons that are not listed, in the “Description” field if necessary. Input validation and button to submit will also be available. Database will be updated when the form is submitted.
2.8 Call Searching and Log

Phone number searching feature is available for user to search and get the information of a corresponding number. A search bar will be provided for user to input the number, result will be displayed in a list. The search function will be connected to the real-time database in Firebase, the matched number with the corresponding organization and category will be displayed in the list.

Besides searching the number, the users are allowed to view log and history of unknown call together with the information from Firebase. By granting the READ_CALL_LOG permission and using the CallLogs module from ‘react-native-call-log’, the log of previous call can be extracted [27]. Only unknown calls will be filtered out and displayed as user may only want to know about the information of the unknown calls. Number will be displayed along with the time when the call is made. The information from the database i.e. category and organisation, will also be extracted and displayed if there is any. Buttons will be provided to report and block a specific unknown call, as well as download the audio of phone conversation, thus allowing the elderly to report the scam call to the police if needed.

2.9 Regular Reminder to Avoid Telephone Deception

To educate the elderly and arouse the awareness in preventing phone scam, notification of tips in avoiding telephone deception will be send to the elderly in a regular basis, such as every morning. PushNotification module from ‘react-native-push-notification’ package will be used to create regular notification [28].

2.10 Summary

This chapter introduced the workflow and methodology of the project. The approaches of the IDE and language, UI/UX design as well as the structure of database have been explained. System design including the major features of the project were illustrated with a flow chart (see Fig. 2.5). The implementation detail and technique to be utilized have also been investigated. The next chapter will present the progress over the first semester together with the potential challenges of the project.
3. Progress and Discussion

This chapter focuses on the current process. An elderly-friendly Android application with basic styling, components and features has been developed. There consists of three major screens with different functions i.e. Search screen, History screen and Report screen, which will be introduced one by one in section 3.1, 3.2 and 3.3 respectively. The function of incoming call screening has also been completed, the detail will be presented in section 3.4. Finally, section 3.5 illustrates the potential challenges that might face in this project.

3.1 Search Screen

When the application is entered, the Search screen will first be prompted. As shown in the Fig. 3.1, call searching function which have been mentioned in section 2.8, is now available on the Search screen. It is connected to the Firebase real-time database. A search bar of number input is provided for the user to search for a specific call, the entries that consists the number in the search bar will be displayed in a list inside the scroll view at real-time with phone number together with the corresponding category and organisation.

![Call searching function in Search screen](image)

Figure 3.1 – Call searching function in Search screen

3.2 History Screen

Call log of unknown calls which have been mentioned in section 2.8 is now available in the History screen, it is displayed in a list inside a scroll view (see Fig. 3.2). The call history is extracted with the help of CallLogs module and will be updated at real-time. It displayed only the call from unsaved contact. If there is information of the call in the database, it will be
displayed with the corresponding number, category, organization and the time when the call is made. However, if no record is found in the database, only “Unknown Call” together with the number and the time when the call is made will be displayed. For this case, button is provided for the user to report the unknown call, screen will be redirected to the Report screen when the button is clicked, and the number in the form will automatically be passed and filled in (see Fig. 3.3).

![Figure 3.2 – Call log](image)

![Figure 3.3 – Redirecting to Report screen when the report button is clicked](image)

### 3.3 Report Screen

As mentioned in section 2.7, users may report a call manually. The call reporting function is now available on the Report Screen. A form is provided for user to report the call (see Fig. 3.4(a)). To minimize input error, there are only two mandatory fields, “Phone number” and “Category”, and two optional fields, “Organization” and “Remarks”, which “Remarks” represents the additional description of the call. User are only required to input the phone number, and category with a dropdown picker, user may decide whether to input the organization or remarks (see Fig. 3.4(b)). After filling the form, user may click the submit button to submit the form, a dialog box with a message “Successfully reported!” will be pop up if the form is successfully submitted, (see Fig. 3.4(c)). The database will also be updated with new reported call immediately. The call information in the History screen will be updated immediately if there is any. User may also search for the new reported call in the Search screen. Additional dropdown fields for choosing the type of business and reasons of scams will be added in the later stage.
3.4 Incoming Call Screening

Incoming call is now being screened to see if it is suspicious. With ConnectionService, the function will always be available even when the app is killed [24]. As stated in section 2.5, whenever there is unknown incoming call, database will be searched to see if there contains any information of the call, the information will be extracted and displayed in the alert if there is any (see Fig. 3.5). Otherwise, the Python function on Azure for parsing and scrapping information with HKJunkCall API will be called with the number and check if there is any information in HKJunkCall database. The information will then be extracted and display in the alert if there is any. The database will also be updated with the information extracted.

Figure 3.4 – Call reporting function in Report screen

Figure 3.5 – Alert to display the information of the incoming call
3.5 Potential Challenges and Mitigations

The function for screening the incoming calls may need to go through both database and HKJunkCall API if there aren’t any records in the database. The running time will be long in this case, resulting in an unexpected time spent and delayed response for screening the incoming calls, instant alert may not be available before the incoming calls are handled. To mitigate the issue, the database will be synced with the HKJunkCall’s database beforehand, with web parsing and scrapping the information with HKJunkCall API by using Python library Selenium and BeautifulSoup4. Hence, it is expected that only the database will be read for screening the calls most of the time, the time for running through HKJunkCall API will be minimized. In addition, to keep the database updated, the synchronization will be performed in a regular basis i.e. every year.

As the feature of near real-time transcription and screening on phone conversation is still under development, there are still many uncertainties and shortcomings to be considered. The running time for the entire process may be long, depending the transcribing and screening speed. Research and trial will be done to investigate the capability of the feature. Transcription and screening on each audio are expected to be done within 30 seconds, thus the warning can be delivered at near real-time. In considering the security and privacy issue, it is expected that the recording of the call will be removed three days after the call is made, thus the user may download the phone conversation as evidence, to report the phone scam to the police if necessary. Only the phone conversation that has been identified as suspicious by the alert dialog after the phone call is ended will be kept. In addition, since the entire process is aimed to be done in the client side, a huge storage space and performance are required for implementation. To reduce the workload of the application, private cloud storage will be considered for processing and storing the recording, further research will be done in the future.

3.6 Summary

The chapter presented the current progress and development of the project, demonstrating the existing functionality of the application including the call searching function, call log, call reporting function as well as the function of incoming call screening. The potential challenges and mitigations have been also covered in the chapter. The future plan together with the project schedule will be illustrated in the next chapter.
4. Future Plan

As the basic function of the application is ready, the next stage will be focusing on the development of the transcription and screening on phone conversation. At the same time, button to block the call and download the phone conversation will be added. Screen for showing the detailed information of the call and the regular notification feature to remind the elderly in avoiding telephone deception are also planned to be developed. In addition, the call reporting form will be fine-tuned with more optional dropdown fields such as the type of business and the reasons of scam. It is expected that all of the above features will be implemented by early March. To reduce the processing time to screen the incoming call, synchronization between our database and the database of HKJunkCall with the help of HKJunkCall API will be performed as soon as possible. Furthermore, the performance of the function to transcribe and screen the phone conversation along with the usage of private cloud storage will also be investigated. Elderly visit for user experience testing will be done as well. Lastly, testing and debugging together with deployment, as well as the preparation on phase 3 including the final report, final presentation and the product demonstration will be done by late March.

**Table 4.1 - Project schedule**

<table>
<thead>
<tr>
<th>Date</th>
<th>Milestones</th>
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<tbody>
<tr>
<td>September 2021</td>
<td><strong>Deliverables of Phrase 1:</strong>&lt;br&gt;● Detailed Project Plan&lt;br&gt;● Project Web Page&lt;br&gt;<strong>Research:</strong>&lt;br&gt;● Existing applications and their technologies behind&lt;br&gt;● Technology can be used to develop the application</td>
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<td>October 2021</td>
<td><strong>Research:</strong>&lt;br&gt;● Tools and steps for implementation&lt;br&gt;● Usage of the HKJunkCall API&lt;br&gt;● UX accessibility for elderly&lt;br&gt;<strong>Implementation:</strong>&lt;br&gt;● System design for the app&lt;br&gt;● UI/UX design for the app</td>
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<td>November 2021</td>
<td><strong>Research:</strong>&lt;br&gt;● Way to web scrap the information from HKJunkCall API&lt;br&gt;<strong>Implementation:</strong>&lt;br&gt;● Database development&lt;br&gt;● Framework and basic feature of the app</td>
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<td>● Elderly interview</td>
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<tr>
<th>December 2021</th>
<th>Preparation of Phrase 2:</th>
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<tr>
<td>● Interim report</td>
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<td>● First presentation</td>
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<td>● Product Demonstration in the first presentation</td>
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<td>● The way to connect the app to the database</td>
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<td>● The way to access call log</td>
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<td>● The way to detect the incoming call number inside the function</td>
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<td>● Function of screening the phone call</td>
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<td>● Function of extracting and updating data to the database</td>
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<td>● Python function for web parsing and scrapping the information with HKJunkCall API</td>
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<td>● Demo in the first presentation</td>
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<td>● Alert system for suspicious calls scanned</td>
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<td>● <a href="#">Call log of unknown calls</a></td>
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<tr>
<td>● <a href="#">Call reporting system</a></td>
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<td>● <a href="#">Button to block specific call</a></td>
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<thead>
<tr>
<th>Reviews:</th>
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<tbody>
<tr>
<td>● Evaluation on the feasibility of implementing the speech to text feature</td>
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<tr>
<th>Research:</th>
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<tbody>
<tr>
<td>● Security measurement</td>
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<tr>
<td>● Private cloud storage for transcription and screening phone conversation</td>
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<table>
<thead>
<tr>
<th>February 2022</th>
<th>Implementation:</th>
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<tr>
<td>● Function of transcription and screening on phone conversation</td>
<td></td>
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<tr>
<td>● Function of filtering sensitive information against the phone conversation</td>
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<tr>
<td>● Regular notification to remind elderly in avoiding scam calls</td>
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<tr>
<td>● <a href="#">Synchronization between our database and the database of HKJunkCall</a></td>
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<tr>
<td>● Button to download the recording of phone call</td>
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<tr>
<td>● <a href="#">Adding additional fields e.g. business, reasons of scams to the reporting form</a></td>
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<th>Other:</th>
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<td>● Elderly visit for testing the application</td>
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<tr>
<th>Research:</th>
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<tr>
<td>● Performance of transcription and screening on the phone conversation</td>
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| March 2022 | **Preparations of Phrase 3:**  
Final report  
- Final presentation  
- Product Demonstration the final presentation  
- Testing and debugging  
**Implementations:**  
- [Screen to show the detailed information of the call]  
- Fine tune the functions  
- Deploying the app  
- Testing of the app  
- Bug fixing |
| April 2022 | **Deliverables of Phrase 3:**  
- Final report  
- Final presentation  
- Product Demonstration the final presentation  
- Preparation for the project competition (if selected) |
5. Conclusion

In view of the rising trend of telephone deception happens to the elderly, it is aspired to reduce the number of victims by a mobile application. The project aims to develop an end-to-end solution that is able to screen out the suspicious calls and give out warning to the elderly. Hence, protecting the elderly from falling into the trap of telephone deception and financial loss. In the past semester, research on the technology and approaches for the application development has been done, such as the technology for detecting and screening incoming call as well as approaches to parse and scrap the data from HKJunkCall API. In addition, several research and interviews with the elderly regarding their needs on using mobile phone were also done to investigate the needs of the elderly. Essentially, an elderly-friendly Android application, Sieve has been developed with functionalities for screening the incoming call, log tracking for unknown call, call searching and reporting.

Although the basic function of the application has been implemented, the function of phone conversation transcription and screening is still under development. It is expected to encounter the potential challenges on the limitation of the storage and running time in the function. To reduce the running time, different approaches for the function will be investigated and tested in the future, approaches with highest performance will be implemented. Private cloud storage will be considered for storing the recording thus tackling the issue of client side storage. Meanwhile, the database will also be synchronized, hence reducing the running time for accessing both database and HKJunkCall API for getting information of the incoming call. By the next phrase, the phone conversation is expected to be successfully transcribed, and the suspicious content are expected to be screened out. Moreover, different features are expected to be done, including screen for showing the detailed information of the call, buttons to block and download the call, as well as the regular reminding notification. Therefore, helping the elderly in avoiding the telephone deception. As part of phase 3, the final report, final presentation with product demonstration will be prepared by early April.
References


