

AI Jansori service: AI Manager

*Software Engineering, Artificial Intelligence and Application

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Abstract—“AI Manager” is a nagging service for single-person household to manage and protect the health of users. The service generates nagging content based on user-recorded data for a day. Nagging categories are largely composed of exercise, diet, and safety. Before starting the day, users hear nagging based on yesterday’s data and nagging related to safety such as weather alerts, COVID-19, and congestion. Also, at the end of the day, user will hear nagging with feedback on the day based on the data user recorded today.

Index Terms—AI Speaker, Mobile Application

ROLE ASSIGNMENT

| Role | Name | Task Description |
|------------------|-------------------------|---|
| User/Customer | All | Since it is a software developed for personal use, there is a very high probability that the user and the customer are the same. They buy products and actually use them in their daily lives. Therefore, it is necessary to accurately understand what their needs are, and analyze what can stimulate their desire to buy, market conditions, and competitive products. You should also receive user feedback to update the product periodically and consider new products. |
| Server Developer | Nayoung Kim, Yunseo Heo | Server development is a technology that manages servers or databases, an area that users of applications cannot see, and actually manages data or operates servers so that clients can provide the information they want. Therefore, server developers engage in various development activities such as system component work, API creation, library creation, and database integration. |
| Client Developer | Yuna Hwang | Client developers should implement a simple, intuitive interface to make our services more convenient for users. In particular, in developing an app, it is very important to accurately recognize what gestures the user makes because not only the screen shown to the user but also all gestures are related to the functions in the app. |

| | | |
|---------------------|-------------------------|--|
| AI Developer | Nayoung Kim, Yunseo Heo | AI developer program systems that will change to suit the business’s needs based on the data collected and analyzed. In this service, they will make AI to recommend based on users’ past data. They design, develop, implement, and monitor AI systems and put efforts on data ingest and data transformation architecture. |
| Development Manager | Yuna Hwang | The development manager manages overall project. Initially, he sets goals for this project, and plans accordingly. Then, he supervises to lead the project to success, such as whether the project is moving well toward its goal and whether each team member is performing his or her duties well. From the beginning to the end of the project, the development manager should continue to consider and strive to meet the needs of clients. In addition, development managers should help ensure smooth communication within the team. |

I. INTRODUCTION

A. Motivation

Recently, the number of senior single-person households is increasing rapidly. In the past, the elderly received support from their children who grew up. There were many large families, but as they became more and more small families, many parents were left alone after their children became independent. Also as the elderly divorce became more frequent, The number of elderly people living alone is increasing not only for bereavement but also for other reasons.

See you. Right before I left the door after saying goodbye, my mom said, “It’s raining today. Take your umbrella,”. It’s sunny outside now and it doesn’t look like it’s going to rain at all. But suddenly, the sky becomes cloudy and it starts to rain. I regret that I should have listened to my mother. Everyone will have a similar experience at least once. Our team wants to create an AI Mom that nags single-person households instead of their mothers with the motif of conversation with their mothers in front of the door before going out.

In addition, most people who live alone do not eat well because they are lazy. AI Mom, which links SK’s AI speaker NUGU with LG’s various smart home appliances aims to improve the

healthy life of single-person households by managing meals, health, and safety like a mother.

B. Problem statement(user's needs)

- According to Statistics Korea, the proportion of single-person households is steadily increasing from 27.2
- As of 2021, the number of deaths without relatives was 3,488 and the number has been continuously increased. As a result, the lonely death of the elderly and young people is emerging as another social problem.
- Lack of social infrastructure to care for single-person households that have no relatives or disconnected from society
- People who live alone often feel lonely
- People who live alone need someone to take care of them.
- Users can feel less pressure if there is someone to help them while they have to deal with everything by themselves.

C. Research on related software

1) NAVER Clova Application & Skill Store

Clova is an AI technology developed by Naver, and Clova-based software includes skills that can be added to the 'Clova application' and artificial intelligence speakers. The Clova app has 'Life Assistant' and 'Smart Home Control' as its main functions. Life Assistant has detailed functions such as schedule management, music selection recommendation, and voice search, and it also reads fairy tales or plays children's songs. In the smart home function, various IoT products are linked with Clova to control lighting, reserve home appliances such as vacuum cleaners and air conditioners. Among the skills that can be added to smart speakers, there are nine skills in Health & Fitness, which are related to "J.Ansol" and all of them are parenting-related skills except for 119 reports. In addition, in the lifestyle & art category, all of the impractical functions that companies put for marketing.

2) GiGA Genie application

GiGA Genie is the most commonly used AI speaker in Korea that developed by KT. Compared to Clova, there are many similar functions that we want to implement. There are relatively various functions such as home training assistance, delivery food information, voice home appliance control, and routine setting. However, think about "whether the user should make a request first" and "whether the product makes a suggestion to me first," the different points is there.

3) Melon

~~This app is the No. 1 product in sales among music/audio-related apps, and has functions such as streaming, storing and playing music, and recommending music. Apps with similar functions include spotify and YouTube Music. Among them, the important thing to see is the music recommendation function. Recommendations are made using data such as songs with similar embeddings, songs with similar words often used, and which songs people who like the same song additionally like. J.Ansol's purpose is not just to play a favorite song, but to play music that suits your mood, so it would be better to use music tags.~~

4) Gourmet-Q

~~Gourmet-Q is an app that recommends menus. Although the number of views and downloads is relatively low compared to other applications, we should give an attention to its recommending system which is based on combining menu evaluations, taste records, and allergy information, not just randomly recommending foods. If possible, we want to make a recommendation function with a similar algorithm. It would be nice to include information such as weather, situation, and emotion.~~

II. REQUIREMENT ANALYSIS

A. Loading

When the application is executed, a loading screen is displayed on the user's screen while data for operation is retrieved. When the loading is complete, it automatically moves to the login screen.

B. Login

In the case of a user who already has an account, user logs in by entering an ID and password. If the user checks the automatic login, user will log in automatically from the next time. Our app also provides an ID/password search if a user forget his ID or password. User who does not have an account should sign up for membership.

C. Finding ID&Password

Since the user is identified by ID and password, it is necessary to prepare for the case where the user forgets the ID and password. So, there is ID and password search function under the login screen. In the case of an ID, user can first identify him(her)self by using the name, phone number and email that he(she) entered when signing up for a member. When the authentication is completed, the ID is displayed on the next page. In the case of passwords, you can find them by ID, phone number, or email. Likewise, when the authentication is completed, there would be a page for initializing the password. User can authenticate him(her)self through the authentication number.

D. Sign Up

Create an AI Manager account through membership registration and make services available. In membership, information such as the user's name, date of birth, email, and phone number is collected. At this time, check whether there is a history of subscription through e-mail. The email address (ID@domain name) collected here is used as the ID of the Ai Manager. What the user needs to set is a password. You get authentication through your phone number.

E. Exercise

Our app receives information from users whether they exercised or not today and provide nagging at the end of the day. In addition, based on exercise data from the previous day, nagging is provided at the beginning of the day tomorrow.

F. Meal Care

The application reminds the user to record whether he/she had meals and a score for the quality of the meal. There will be 3 push alarms for a day.

1) Whether user had a meal or not

A user inputs meal status data. If there is no record, it is considered not to have eaten and the number of times is not counted. The nagging content varies depending on the number of meals. If the record is zero, nagging includes requests to record, considering the cases that user might forget to put data.

2) Quality of the meal

The quality of the meal is judged and scored by the user him/her/self. This is because the quality of meals may be relatively different individually even on the same menu. So, it is difficult to judge arbitrarily in the service. Instead, we will provide guidelines within the service so that the deviation of the score is not too large. The score ranges from 0 to 100, and at the end of the day, the average is calculated to determine the quality of the meal per day.

G. Safety

For users' safe lives, we provide nagging related to weather, disaster, and congestion. The weather nags according to the situation when various weather warnings and warnings are issued. In the case of COVID-19, if the number of confirmed cases increased rapidly the previous day, it tells you the increase and warns you to pay attention to quarantine. Except for COVID-19, other disasters such as earthquakes and fires are not known in advance, but it randomly tells one useful common sense related to disasters on days when no other safety nagging is needed. Congestion-related nagging tells the location and time of the protests in case of protests, tells the places expected to be crowded during representative holidays such as Christmas, Halloween, and New Year, and cautions user to be careful when going out.

H. Mobile Application

1) User Identification

After creating an account, the user must set a default profile. Basic information requires name, age, gender, residence, and contact information. The name, age, and gender are unique data so they cannot be changed. If it needs to be changed, it can be changed after entering the password with a warning that the recommendation function may not be smooth. There is also a nickname function, so when you hear nagging, you can choose the name you want to be called. In addition, you can request information that can be helpful when learning AI such as food taste, exercise degree, and life pattern. When the account is deleted, the profile and data are also deleted.

2) AI On/Off Function

In special circumstances, you may want to turn off or have to turn off the nagging of the ai speaker. In addition, there are cases where you don't want to hear nagging about a specific part. Considering this case, we provides a function to turn nagging on and off entirely or partially. You can turn off the Ai speaker at all, but you can also turn on and off nagging through the app.

3) Nagging or Alarm Selection

We considered cases where you may want to hear notifications through AI speakers, but you want to hear notifications only with alarm sounds except for voices. If you don't want to be nagged but want to be notified, you can choose one of the two modes in each function. The alarm music has to be set before or user will hear the default sound. Both alarm and nagging functions can be selected, in which case music comes out with words.

4) Progress of Household Chores

The app provides information for LG's appliances to do chores by connecting ai speaker to the appliances. First, users can check whether the home appliance is running through the on/off indication for each connected appliances, and how far it has progressed through the bar. Below that, the scheduled date and time for the next cleaning is shown. It also tells users when they have to clean up the appliances based on characteristics of each appliances.

I. NUGU API

1) Physical Care

Ask at the set time that if user exercised or not. And if user give an answer that didn't do the exercise, tell user to do it. If it can be linked to smart home appliances such as smart TVs or ThinQ application, it can turn on the connected TV to show the stored YouTube home training videos, and turn on air conditioners or music

to set up in a comfortable state to exercise.

2) Eating Life

when there was a person at home and there was no opening and closing the refrigerator on time, J.Ansol will asks "Did you have a meal?". If the answer comes back that user didn't eat yet, it will encourage users to eat at on time. And if you have difficulty choosing a menu, she will recommend a menu. Menu recommendations are made according to general preferences, weather, and learned user's tastes.

3) Wake-up & Sleep Alarm

It provides wake-up and sleep alarm functions based on the user's life pattern. The basic alarm sound is nagging, but the alarm sound can be set according to the user's taste by providing various options. In addition, a lighting management function is provided, such as turning on a light during wake-up time and turning off the lighting management functions are provided.

4) Household Chores

Let users know and prepare before LG appliances do a regular cleaning. (ex. put clothes in a laundry basket, and dishes in a dishwasher) If you are in a situation where appliances should not clean, you can postpone it through the Postpone Housework button. You can check the process of cleaning within the app.

5) Mental Care

In the mental function, user can use services such as daily greeting, a question about mood, a recommendation music or video for meditation and mental care. Greeting would be "have a wonderful day" in the morning and asking what kind of day it was in the evening like a sweet roommate. By asking how user feel, AI can recognize some words and recommend music that fits the user's mood, or recommend meditation that is good for mental care.

J. AI Algorithm

1) Recommendation

a) Menu Recommendation

After making a product and investigating people's preference menus by weather, questions are asked based on general preferences. After that, the user's taste is grasped through the answer to the question and learned to make more sophisticated recommendations. It seems that it will be helpful for people to sometimes be recommended to feel confident in their own intentions.

b) Music Recommendation

Similar to the menu by weather, after researching music genres and singers that fit emotions,

questions are asked based on general preferences. The beginning of the first conversation is to ask for emotions, which largely divides the categories of emotions into three categories: "depression," "feel good," and "calm." And ask if it is okay to play music corresponding to each category. At this time, it is necessary to be able to learn whether the user prefers music similar to his or her emotions or the opposite music. It should also be learned to prefer a particular genre or singer's music.

2) Life Pattern

It identifies the time to sleep, the total time to use the cell phone, and the time to eat, and gradually changes the question time according to the user's life pattern. However, the purpose of this software is to nag users for a better life, so J.Ansol tries to gradually get closer to the goal that the user initially set (ex. I'll make sure to eat breakfast before 8 o'clock on weekdays e.g.). If the user wants to, users can get a statistic weekly reports which is related to life patterns.

3) Natural Language Processing

a) hahahah

b) aldl

III. DEVELOPMENT ENVIRONMENT

A. Choice of software development platform

1) Which platform and why?

Our team is planning to use both Linux and Windows. When developing, Linux is usually preferred to Windows as a development environment. Linux provides a rich software development environment first. Linux provides most programming languages, so that user can develop programs regardless of tools. In addition, user can download the program comfortably with the "sudo apt-get install". That's why updates and management are so useful. User does not have to install programs like Windows. Finally, it is a free operating system that has a cost advantage. Nevertheless, we will also use Windows because it is a more familiar OS for our team members. We think there will be no problem because various tools are provided for Windows. If there is a problem, we will build and use a Linux environment using a virtual machine.

2) Which programming language and why?

3) Provide clear information about your development environment:

- Windows 10
 - 2.90GHz Intel Core i7
 - 16GB RAM

| Tool and Language | Reason |
|-------------------|--|
| Java Script XML | JavaScript is an object-based language often used in web development. We decided to use JavaScript XML, an extended grammar of JavaScript, to create the app. It is convenient to use HTML as well as things that can be done with existing JavaScript. In addition, when working on UI, the code can be understood more intuitively, so it is easy to work. In addition, the length of the code can be reduced compared to when using the existing js. |
| Python | Python was ranked No. 1 as the most popular programming language as of October 2022, according to the TIOBE Index. It is a highly accessible programming language because of the simple code and grammar. It also has rich machine learning libraries and frameworks such as pandas, scikit-learn, and TensorFlow. It also performs detailed memory management for programmers. In addition, the programmer community using Python is also active, making it easy to share code or solve problems. |

- 2.30GHz Intel Pentium
- 4GB RAM
- Windows 11 Home
 - 1.80GHz Intel Core i5
 - 8GM RAM
- Visual Studio Code 1.72.2
- Git 2.30.0

B. Software in use

- 1) *React Native*: react is a library for web development originally developed by Facebook. react native is Facebook's open-source framework that extends such a reaction approach to mobile. It features a cross platform that can produce both iOS and Android apps. Mobile JavaScript was a method of building an interface through webview, but React Native displays it as a native widget. It uses JavaScript or JavaScript xml.



Fig. 1. React Native

- 2) *Git, GitHub*: GitHub is Microsoft's web service that hosts source code and provides collaborative supports based on Git, a distributed version control software. In addition, Git provides remote storage management and issue trackers for collaboration as well as code hosting service. GitHub is a necessary tool for development collaboration with fork function and full request function.
- 3) *LATEX*: LATEX is a document creation tool, and has the advantage of being easy to enter page numbers, footnotes, formulas, graphs, and tables. Also, even if the



Fig. 2. Git, GitHub

size of the document grows, it uses computer resources rather than words or '한글'. Version management is possible because it is written as a text file, not a binary.



Fig. 3. LaTeX

- 4) *NOTION*: NOTION is one of the workspace for the team. It has the advantage of being able to share the progress of the project or manage documents scattered in several places in one place. So, we can immediately understand the workflow of each team member. In addition, it is a fun service to use because users can customize it as they want. Various templates are also being shared.



Fig. 4. NOTION

- 5) *ZOOM*: Since it's difficult to meet all together, we plan to hold meetings online using zoom. Zoom has the advantage of being able to have meetings whenever and wherever the Internet is connected and therefore we can also use spare time to talk.



Fig. 5. ZOOM

- 6) *Kakao Oven*: Kakao Oven is a prototyping tool that allows users to design UI and UX before actually

developing apps. By visualizing the app in advance, we can develop the app more specifically and systematically. Unlike other prototyping tools, Kakao Oven is free and it is simple and all in Korean, so we thought it would be suitable for our team members who have no experience in development.

- 7) *Google Docs*: Google Docs is a cloud service that allows multiple people to work with MS Words on the Internet. It can be useful for writing minutes or recording details of ideas and services we want to share while working on a team project.



Fig. 6. Google Docs

IV. SPECIFICATIONS

A. Loading Page

Insert an icon in the middle of the screen indicating that it is loading. Underneath, put a phrase 'It is loading. Please wait a moment.'

B. Login page

Put the ID and password entry box in the middle of the screen and put the login button next to it. Below that, put a check box where a user can set up automatic login. If the ID or password is entered incorrectly, put up a phrase 'ID or password is incorrectly. Please re-enter.' under auto-login check box. And below that, there is ID/password search and membership registration tab. After the login is complete, it automatically moves to the main page.

C. Find ID&Password

1) Find ID

User can authenticate him(her)self by receiving the authentication number through the phone number or email he(she) wrote when signing up for membership. When self-authentication is completed, the ID is displayed in the next page.

2) Find Password

If user receive the authentication number through the phone number or email he(she) wrote when signing

up for a member, put the number in the box and the authentication will be completed. If self-certification is successfully finished, it goes beyond the password initialization screen to help him(her) to reset password.

D. Sign Up

Enter the name, date of birth, and email of the service user in order. Check whether user have duplicate subscriptions through email. After that, user authenticate themselves with their phone numbers. Everything is done in one window, and only self-authentication displays a new authentication page and returns to the original page. The identity authentication uses IMPORT's library. The password must be a string consisting of at least eight letters, numbers, and special characters. If the conditions are not met, it tells you to re-enter in red letters. Create a password check box to verify that you have entered the password correctly, and if it is not the same as the password entered above, tell them to re-enter it in red letters.

E. Exercise

After creating a calendar that can record whether a user has exercised or not today in the app, the user enters exercise status every day through a push message. If there is no input within 24 o'clock, it is considered that the user has not exercised today. Nagging the user based on the input data. If a user worked out today, the app can compliment at the end of the day and the next day, nagging to work out today, too or stretch today because you worked out yesterday. If a user didn't exercise today, criticize at the end of the day and the next day, nagging to make sure you work out today.

F. Meal Plan

1) Meal Data

- the Number of meals:

It is the data for whether user have eaten or not. If there is any data input, the program will count it.

- Meal Quality:

It is the score data for the quality of each meal. User will decide the score. This data will be used for assessing the quality of whole meal of the day by averaging the scores.

2) Before Starting the Day

Service provide nagging based on the data user recorded yesterday.

3) After Finishing the Day

The total score of the number of meals and the quality of the meal is combined to give a general evaluation. If user's total score is between 0 and 50, speaker will

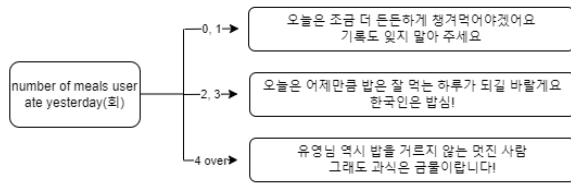


Fig. 7. Process based on number of meals user had

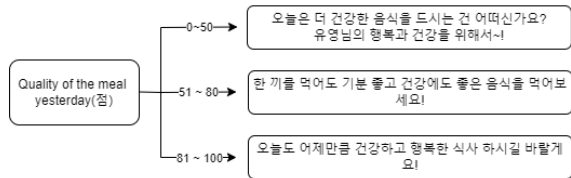


Fig. 8. Process based quality of meals

send a message saying that user need to eat well. If it's between 51 and 80, speaker will give the message for complement for having generous meals. Finally, if it is more than 81 points, speaker will send a message saying that user had a wonderful meal today.

G. Safety

1) Weather

When a weather warning or warning is issued, it nags accordingly. If multiple warnings overlap, they tell you everything. Weather-related data is taken from the Data List — Public Data Portal (data.go.kr).

Heat wave warning - "We recommend you to stay indoors as much as possible because heat waves are expected."

Day with UV index above 6 - "Put on sunscreen and go out"

Cold wave warning - "It's cold wave warning, so dress warmly."

Typhoon Warning - "Close the windows and refrain from going out as much as possible"

Fine dust warning - "Please wear a mask because fine dust is severe"

2) Disasters

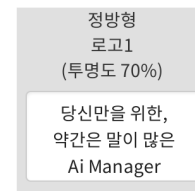
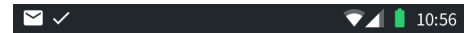
Disaster situations (fire, earthquake, tsunami, and distress) are often unknown before a situation occurs. Choose one which is about how to act in disaster situations randomly and tell them on a day when there is nothing else to nag. COVID-19-related nagging also belongs to this category, and when the number of confirmed cases of COVID-19 surged the previous day, it nags, "Do thorough personal quarantine management!" Data related to the number of COVID-19

confirmed cases are taken from the data list — Public Data Portal (data.go.kr) as in the weather.

3) Congestion

If there is a large-scale rally or demonstration scheduled, tell them to refer to it by telling them the location, time, and number of demonstrators. (Example: Today, the demonstration is scheduled on Line 5 from 8:30 a.m., so please refer to it.) Information related to such rallies and protests should be brought by crawling the National Police Agency site (smpa.go.kr)


In addition, pre-designated nagging is required for Christmas, Halloween, New Year's Day, and famous festivals that can attract crowds. Representatively, it tells the place where the crowd gathers every year. Myeong-dong on Christmas, Itaewon on Halloween, and Bosingak on New Year's Day were set as dangerous areas. The festival, which will attract crowds, was set up as Yeouido Fireworks Festival and Water Bomb, and the date and location information can be changed every year.




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CANCEL SUBMIT

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CANCEL SUBMIT

운동

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식사

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안전

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데일리 리포트

☐

오늘의 운동
8:00~8:30
스트레칭

운동 주기 설정
캘린더형
드롭다운

운동을 마치셨나요?
☒
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(운동 한 달은 동그라미로 표시)

운동 영상 설정
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☒ 재난, 재해 관련 생존수칙 잔소리

☒ 코로나 관련 개인 방역 잔소리

☒ 기념일 혼잡도 관련 잔소리

☒ 크리스마스 - 명동

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☒ 국제 불꽃축제 - 여의도

+ 추가 가능