

날마다 내 마음 돌보기
노래하는 일기,
NOTE&REST

2024-1 창의연구실습

Artificial Intelligence, Human-centered Design, Role of AI
Mental health, Therapy, Diary-keeping, Diary APPs, Conversational agent
Therapy music, Music generation

5조

박준영 이유진
조혜원 천지인





서비스 구상 배경

01 BACKGROUND

PAIN PONT / RESEARCH / FLOW

BACKGROUND - Research

일기의 효능: 마음 관리

1

EXTERNAL MONITORING FUNCTION

- 감정과 생각의 변동패턴 확인 (KIDMAN 1996)
- 자가평가 및 자기경험 확인
- 선행징후와 후속행동 및 사건 분석

2

PERSON-CENTERED & RECOVERY-BASED CARE

- 상황에 대한 수용과 적응을 도움 (BULMAN ET AL. 2012)
- 반성적 반응양식과 기억, 희망, 두려움, 불안, 긴장을 반추할 수 있는 능력 발달 (UTLEY AND GARZA 2011)
- 깊은 감정과 자기 지식 드러내는 안전한 공간 제공, 스스로의 해로운 습관 및 행동 모니터링 역할
- 자신을 깊이 이해하는데 도움

3

사적 대화의 행위 (ACT OF PRIVATE COMMUNICATION)

- 스스로에게 일어난 사건과 느낀 감정을 재고하여 이에 대한 소유와 통제를 얻을 수 있게 함;

4

반영(REFLECTION) & 시간성의 원칙

- 외부 도움 없이 반영적 일기를 쓰는 것은 어려운 것으로 파악됨



일기를 올바르게 작성하고 이를 잘 복기할 경우, 스스로의 감정을 이해하고 통제력을 강화시키는 효과 O



BACKGROUND - Research

일기의 효능: 마음 관리

1~4



International Journal of Mental Health Nursing (2016) 25, 19–26

FEATURE ARTICLE

Exploring the diary as a recovery-oriented therapeutic tool

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ABSTRACT: Diary writing is a centuries-old method of recording events, experiences, thoughts, and feelings that might offer potential as a tool that consumers and nurses could utilize in recovery-oriented practice. While the diary has been used within health disciplines to detail and communicate personal experiences to enable collaborative examination of progress, a diary can also provide a more complete picture of what life is like; not only within the confines of a health service environment, but also outside. In recent times, the diary appears to be experiencing a renewed interest in terms of health care. People experiencing a mental health challenge might use diary-based forms of communication to promote understanding between themselves and mental health workers, and ultimately the use of this form of narrative therapy might facilitate person-centred, recovery-based actions. The present study paper, therefore, explores multiple perspectives on the use of diaries in the therapeutic context. Suggesting that diaries have not yet been utilized to their fullest potential by and with consumers and clinicians, this discussion raises issues and offers clarity about diary forms and their uses in the health context. It also discusses the barriers to their use and how to engage consumers and clinicians in recovery-oriented work.

KEY WORDS: diary, mental health, recovery, writing.

INTRODUCTION

Recovery policy and practice in mental health nursing aims to support individuals affected by mental health challenges to restore and keep their mental health and well-being, live a contributing life, and improve health-care participation. It also involves care that is person centred and collaborative (National Mental Health Commission 2014). In the present paper, we define recovery as a unique journey requiring engagement between consumer and clinicians, such as nurses, and that involves learning about the self, and the re-emergence of hope, well-being, and adaptation throughout a mental health experience (McAllister 2015). As Davidson *et al.* (2005) explain, this means three things. The first is that

Such recovery-based care might take place in every context where a consumer is located (Davidson *et al.* 2005). The recently-released national report reviewing mental health programmes and services in Australia has revealed, however, that significant gaps and deficiencies remain in relation to this aspect of mental health care because the system is driven by what providers provide, rather than what people want, need, and could be supported to do (National Mental Health Commission 2014; p. 38). Innovative approaches are needed to promote this person-centred approach and to empower both clinicians and consumers to be confident, effective participants in recovery-based

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Written Emotional Expression: Effect Sizes, Outcome Types, and Moderating Variables

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A research synthesis was conducted to examine the relationship between a written emotional expression task and subsequent health. This writing task was found to lead to significantly improved health outcomes in healthy participants. Health was enhanced in 4 outcome types—reported physical health, psychological well-being, physiological functioning, and general functioning—but health behaviors were not influenced. Writing also increased immediate (pre- to postwriting) distress, which was unrelated to health outcomes. The relation between written emotional expression and health was moderated by a number of variables, including the use of college students as participants, gender, duration of the manipulation, publication status of the study, and specific writing content instructions.

Emotional expression has long been given a central role in the study and practice of psychology. Both historically and recently, psychologists have cited the expression of emotions as vital for good mental and physical health, although the inhibition of emotion was considered deleterious (e.g., Breuer & Freud, 1895/1966; Grinker & Spiegel, 1945; Rachman, 1980; Scheff, 1979). More recently, there has been a growing body of literature suggesting that emotional expression has salutary health effects (e.g., Esterling, Antoni, Kumar, & Schneiderman, 1990; Fawzy *et al.*, 1993; Mumford, Schlesinger, & Glass, 1983; Murray, Laminin, & Carver, 1989; Pennebaker & O'Heeron, 1984; Spiegel, Bloom, Kraemer, & Gottheil, 1989), whereas emotional inhibition has detrimental health effects (e.g., Florin, Freudenberger, & Hollander, 1985; Goldstein, Edelberg, Meier, & Davis, 1988; Janner, Schwartz, & Leigh, 1988; Jensen, 1987; Larson, 1990).

This emerging area seems especially important in light of the fact that this finding has been applied on the basis of a small number of studies. For instance, entering students at a major university are routinely asked to perform this writing task (J. Pennebaker, personal communication, October 2, 1995). Any number of people may be “self-prescribing” the writing task on the basis of lay reports and publications. *American Health*, for instance, published articles titled “Writing your wrongs” (Pennebaker, 1991) and “Writing off the unemployment blues” (Willensky, 1993), both lauding the benefit of emotional writing. Furthermore, people may have an intense desire to express or discuss traumatic events, yet experience social constraints that force them not to talk about it (Lepore, Silver, Wortman, & Wayment, 1996; Pennebaker & Harber, 1993). Written expression may thus fill a very important niche—providing a mechanism of emotional expression in circumstances where interpersonal expression is not viable.

Originally, writing was conceptualized as allowing individuals to confront upsetting topics, reducing the constraints or inhibitions associated with not talking about the event. The work of inhibition (i.e., the cumulative physiological drain) was considered to cause and/or exacerbate stress-related disease processes (Pennebaker, 1989). Although early work focused on the central role of emotional expression (cf. Scheff, 1979), evidence suggests that emotional expression may be necessary, but is not sufficient, to produce positive change (Murray, Laminin, & Carver, 1989; Pennebaker & Beall, 1986). More recently, Pennebaker and others have suggested that emotional expression facilitates cognitive processing of the traumatic memory, which

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MindfulDiary: Harnessing Large Language Model to Support Psychiatric Patients' Journaling

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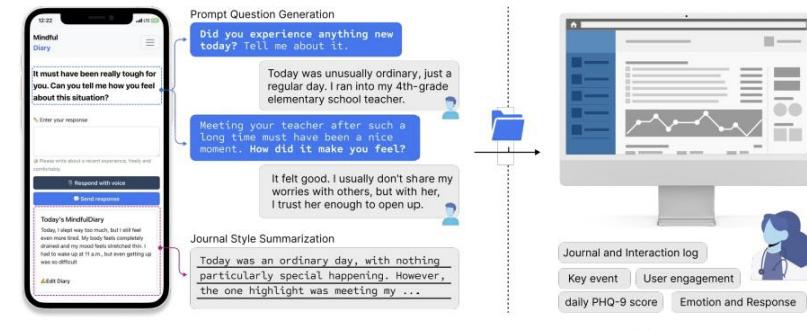


Figure 1: MindfulDiary consists of two components: the patient interface and the expert interface: (1) Patient interface aids users in daily journaling, offering prompt questions through conversations and crafting summaries in a diary-like format. (2) Clinician Dashboard features a dashboard that visualizes data from patient records, facilitating its use during consultations. (Refer to our supplementary video for the user interaction.)

ABSTRACT

Large Language Models (LLMs) offer promising opportunities in medical health domains, although their inherent complexity and low

controllability elicit concern regarding their applicability in clinical settings. We present MindfulDiary, an LLM-driven journaling app that helps psychiatric patients document daily experiences through conversation. Designed in collaboration with mental health professionals, MindfulDiary takes a state-based approach to safely comply with the experts' guidelines while carrying on free-form conversations.

Through a four-week field study involving 28 patients with major depressive disorder and five psychiatrists, we examined how MindfulDiary facilitates patients' journaling practice and clinical care. The study revealed that MindfulDiary supported patients in consistently enriching their daily records and helped clinicians better empathize with their patients through an understanding of their thoughts and daily contexts. Drawing on these findings, we discuss the implications of leveraging LLMs in the mental health

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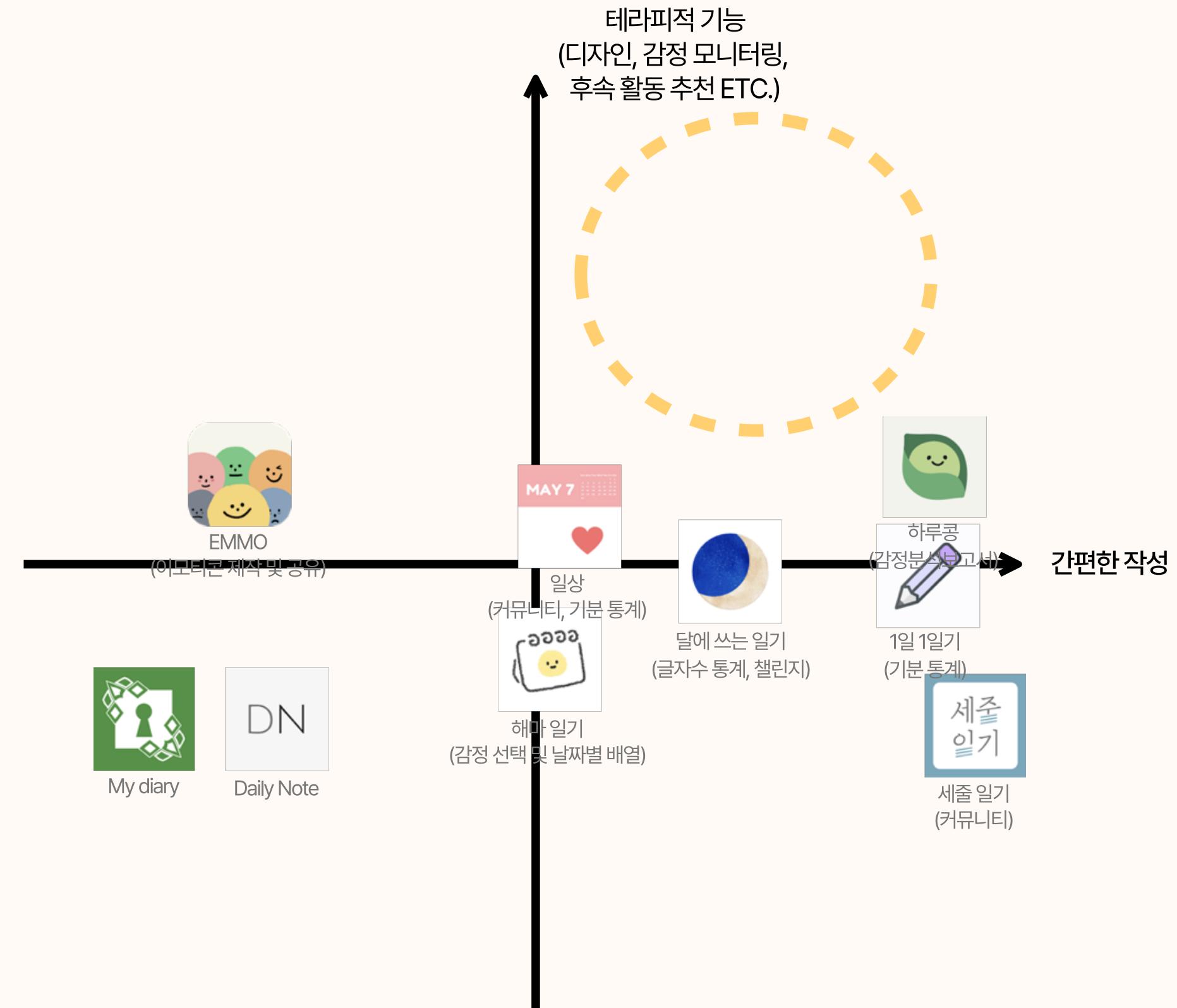
BACKGROUND - 2

일기 APP 시장 분석

.....

분석 결과:

1. 그날의 감정을 선택해 기록하는 기능이 주를 이룸.
2. 감정을 선택하더라도 최대 간단한 분석 정보만 제공할 뿐, 테라피 활동으로 확장하는 기능 부재.

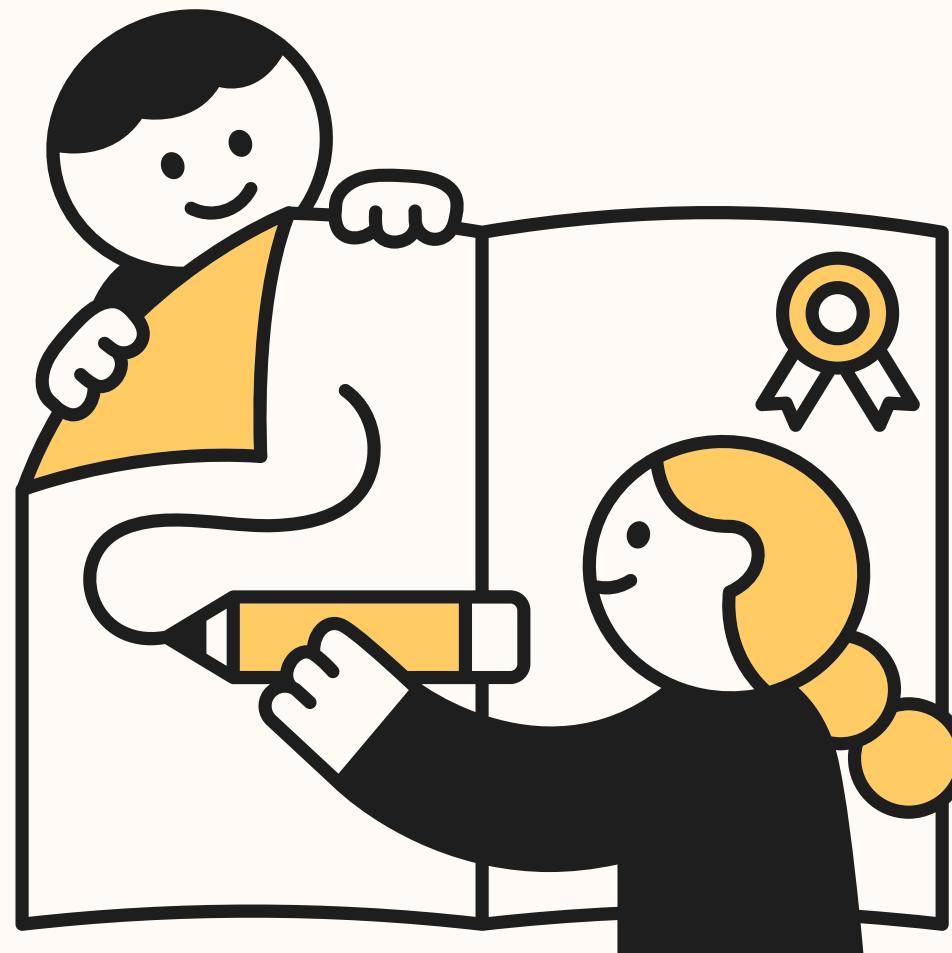


BACKGROUND - 3

잠재적 유저의 문제상황

CHALLENGES OF POTENTIAL 'DIARISTS'

일기를 쓰고는 싶은데..
글쓰는 건 너무 귀찮아.
매일 결심만 하고 미루다가 결국 포기하게 돼.



일기를 쓰기는 하는데, 딱히 효과는 못 느껴.
그냥 생각이 떠오르는대로 적고 휘발되는
소모적인 일일 뿐이라는 생각이 들어.

BACKGROUND - 4



LLM을 통한 일기 가이딩 제공에 대한 연구
대화형 에이전트가 사용자와의 인터랙션을 통해 일기 제안
지속적으로 기록을 작성하는 데 실질적으로 도움이 된다는 결과

- AI 챗봇과의 “대화”를 통해 하루 정리
 - ‘쓰기’보다 부담이 적은 ‘말하기’로 하루 정리
 - 하루의 사건, 행동, 감정, 생각에 대한 질문을 통해 쉽게 하루의 일을 복기
 - 일기쓰기의 사적 특성을 유지하면서도 객관적인 자기반영을 도움
- 인격이 있는 캐릭터와의 대화를 통해 치유의 경험 제공
 - 감정수용 및 공감의 대화를 제공
 - 부담없이 감정과 생각 등 공유할 수 있도록 유도
- 대화를 기반으로 완성된 일기 제공

Wanling Cai, Yucheng Jin, Xianglin Zhao, and Li Chen. 2023.
“Listen to Music, Listen to Yourself”:

Design of a Conversational Agent to Support Self-Awareness While Listening to Music.

- 음악, 특히 하루의 감정을 바탕으로 한 음악 추천은 정신건강에 도움됨
- 일기의 청각화를 통해 하루의 감정을 음악으로 치환
 - 언어뿐만 아니라 음악이라는 다른 감각으로 하루를 한번 더 돌아볼 수 있는 경험
- 텍스트보다 부담이 적은 음악의 특성
 - 기존에 생성된 음악을 다시 듣는 것을 통해 지난 경험을 복기
 - 일기를 다시 보는 정신적 부담 줄여 소모적인 일기 습관의 한계 해결



서비스 설계 및 소개

02 INTRODUCTION

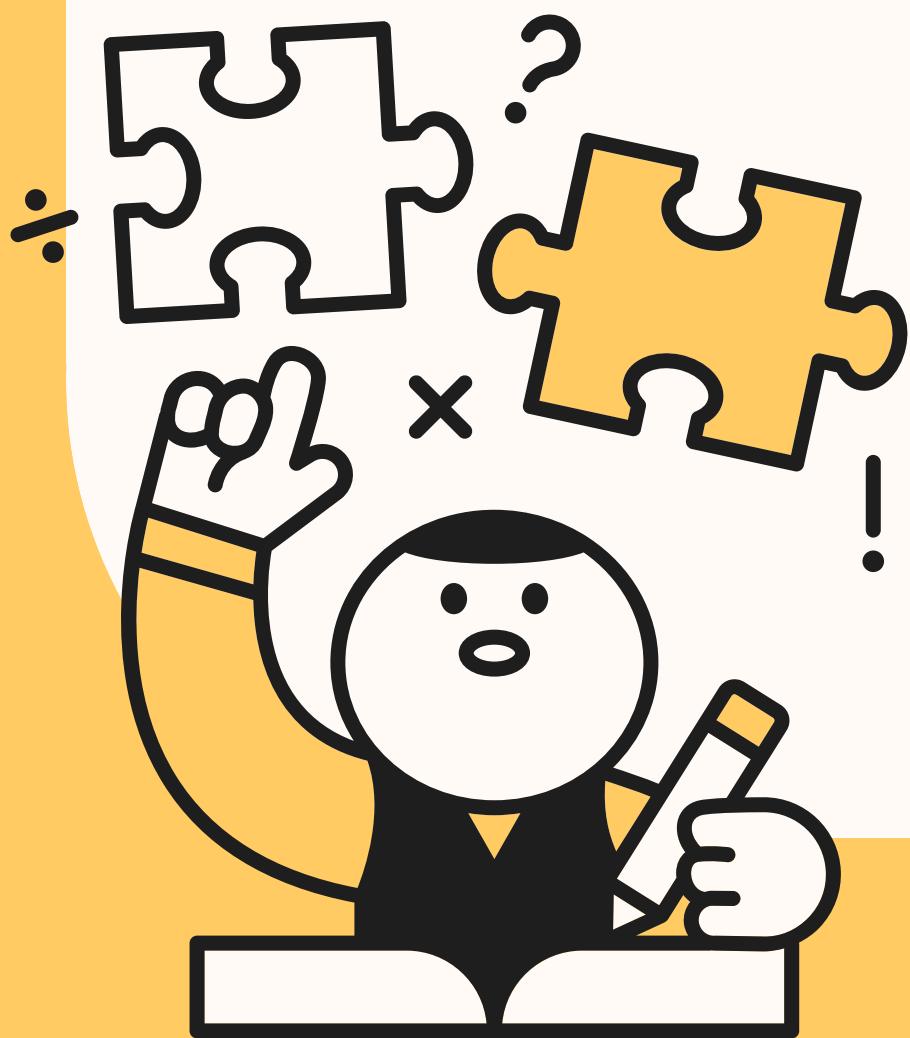
ROLE OF AI

SERVICE NAME & CONCEPT

USER PERSONA

Role of AI

AI 사용 근거



- 01 INTERACTION BASED ON NATURAL LANGUAGE**
'의인화된 일기'라는 컨셉을 구현하기 위해서는 자연스러운 자연어 인터랙션이 필요
- 02 GENERATION**
에이전트와 사용자 간 대화를 바탕으로 한 텍스트(일기) 생성
대화에서 드러난 감정을 바탕으로 한 음악의 생성
- 03 PERSONALIZATION**
사용자마다 다른 일기와 음악의 선호도를 바탕으로 하여 각기 다른 스타일의 일기와 음악을 생성

Note & Rest

[명사]

1. 메모, 기록

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7. 음, 음표

[명사]

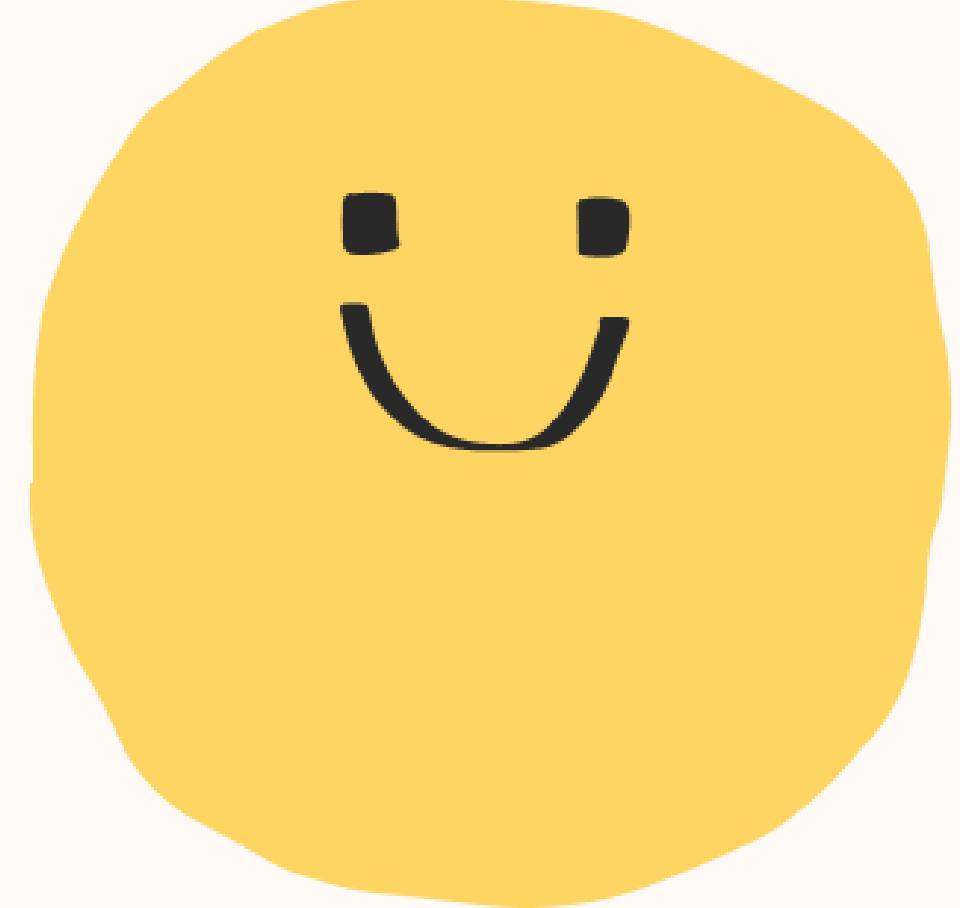
3. 휴식

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5. 숨표

→ 하루의 마무리를 도와주는 '노래하는 일기';
대화를 통해 쉽게 하루를 정리할 수 있게 해주고, 들으며 '힐링'할 수 있는 음악을 생성해주는 서비스



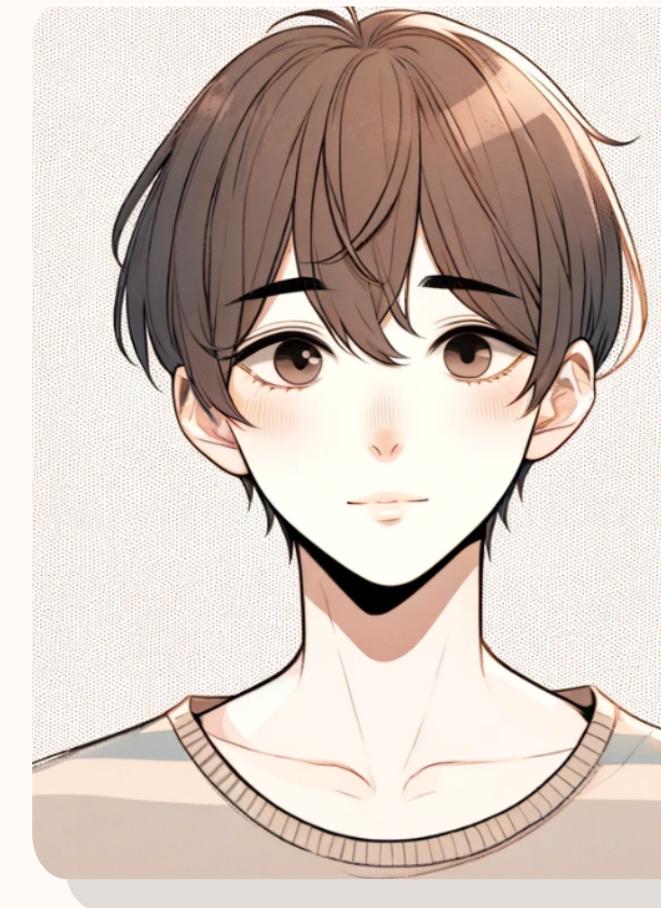
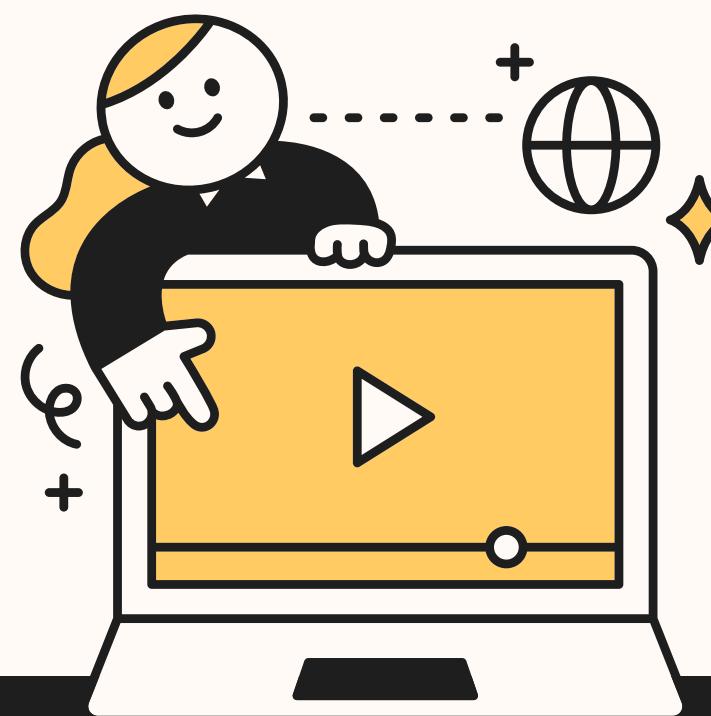
편하게 대화만 해도
네 하루를 돌아보는
유익한 시간이 될 거야!

오늘의 널 치유해줄
음악을 만들어줄게 :)

'노레'
맞춤형 대화 파트너 AI + 맞춤형 음악 생성 AI

PERSONA

유저 페르소나



윤서원

만 23세, 대학생

• About

대학교 근처에서 자취를 하고 있는 대학생.
취미는 음악 감상.
혼자 살다보니 스스로 마음을 돌보기 위해 노력할 필요성을 느끼고 있다.
규칙적으로 일기를 쓰는 것이 이에 도움이 된다고 하여 습관을 들이고자 여러 차례 시도했지만 실패하고 있다.

• Pain Points

- 일기를 쓰는데 필요한 인지적, 심리적 부담감 때문에 일기를 매일 작성하는 습관을 쉽게 들이지 못한다.
- 일기를 쓰더라도 그날 있었던 일 정도만 기록하는 소모적, 휘발적 행동으로 끝나고 말기 때문에 일기를 통해 정신 건강을 챙기기 쉽지 않다.

• Needs

- 인지적, 심리적 부담감 없이 쉽게 일기를 쓰고 싶다.
- 일기를 통해 마음을 돌보고 싶다.



03 UI & FUNCTIONS

UI 및 기능 소개

UI CONCEPT & KEY COLORS

6 FUNCTIONS & PAGES

USER JOURNEY MAP

UI Concept & Key Color

UI DESIGN

하루를 편안하게 마무리할 수 있도록,

1. 편안하고 따뜻한 색감 사용

2. 부담없이 가볍게 지난 감정을 돌아볼 수 있도록 감정 아이콘 디자인

3. 한 화면에 너무 많은 정보를 제공하기보다 핵심만 전달하고 사용자가 원할 시 추가로 볼 수 있도록 화면 구성

Key Color



감정 emoticon



*그 외 감정 예시

Positive		Negative		Ambiguous
admiration 🌟	joy 😊	anger 😡	grief 😢	confusion 😕
amusement 😂	love ❤️	annoyance 😦	nervousness 😰	curiosity 😤
approval 👍	optimism 🌟	disappointment 🙁	remorse 😦	realization 💡
caring 😊	pride 😎	disapproval 🙅	sadness 😞	surprise 😲
desire 😚	relief 😊	disgust 😢	embarrassment 😨	
excitement 😃		fear 😱		
gratitude 🙏				

Demszky, Dorottya et al.

"GoEmotions: A Dataset of Fine-Grained Emotions." (2020)
구글 AI에서 분류한 감정 dataset

UI Concept & Key Color

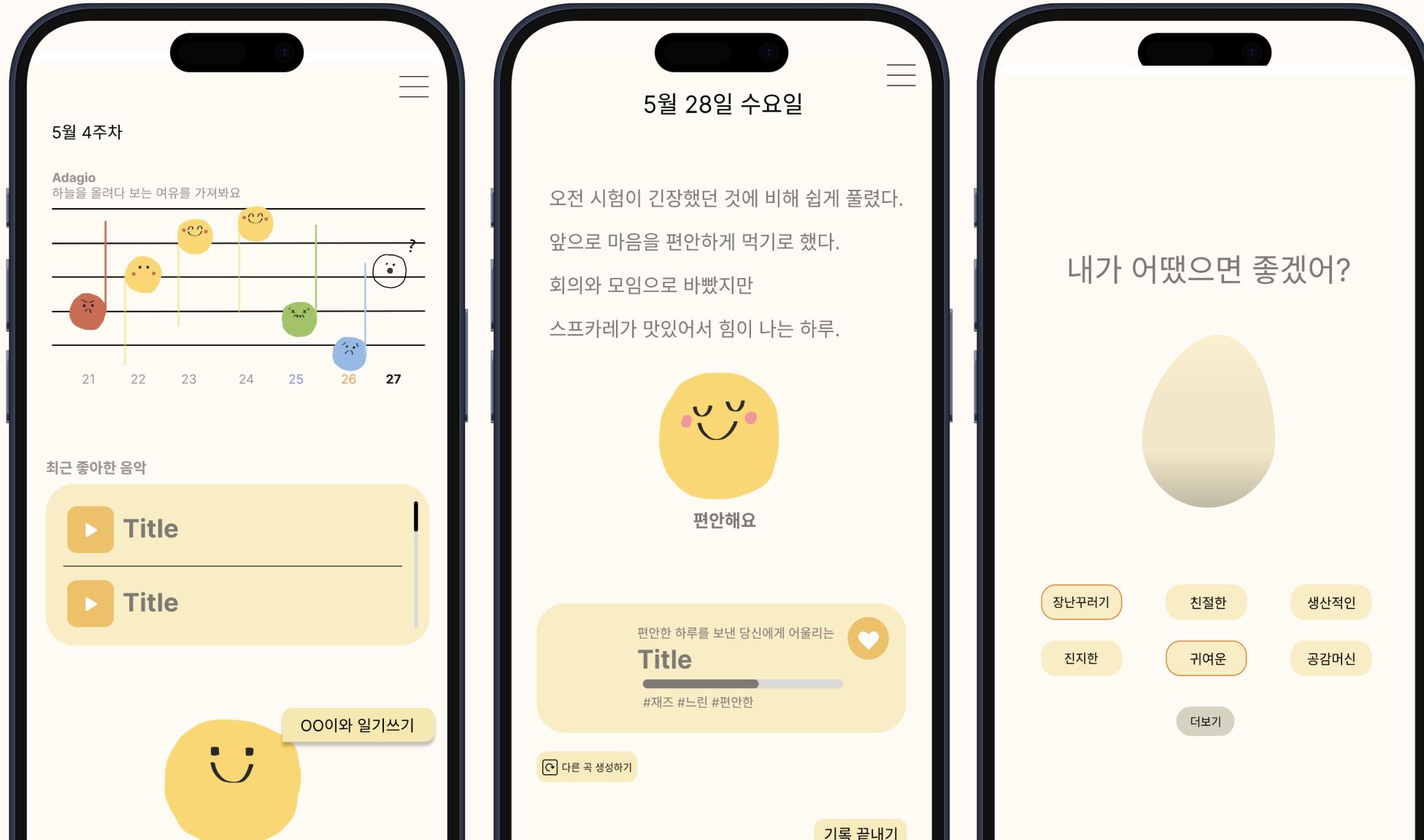
UI DESIGN

하루를 편안하게 마무리할 수 있도록,

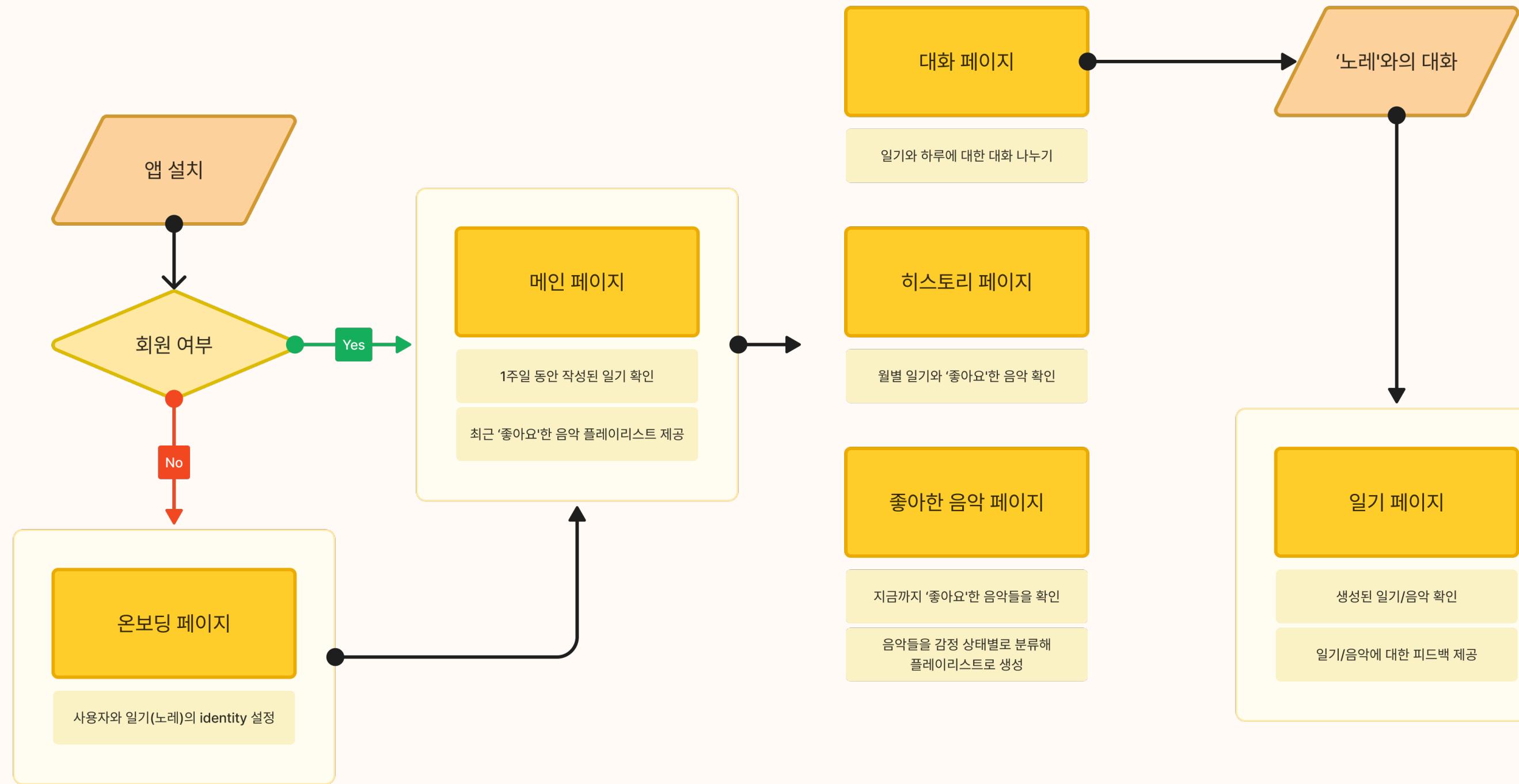
1. 편안하고 따뜻한 색감 사용

2. 부담없이 가볍게 지난 감정을 돌아볼 수 있도록 감정 아이콘 디자인

3. 한 화면에 너무 많은 정보를 제공하기보다 핵심만 전달하고 사용자가 원할 시 추가로 볼 수 있도록 화면 구성



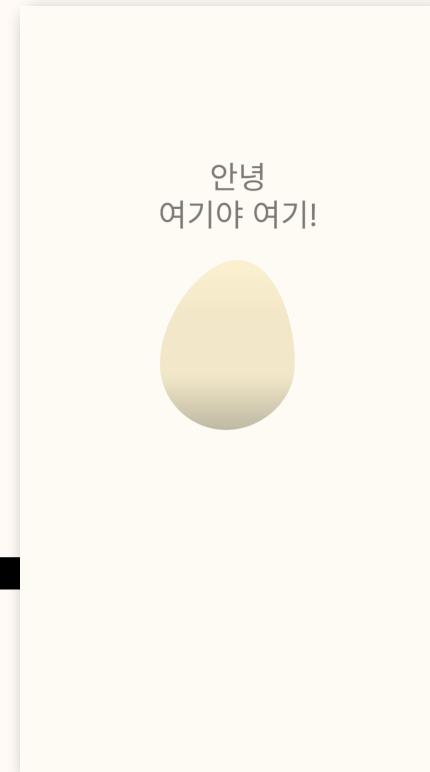
PRODUCT FLOW CHART



ONBOARDING

대화형 에이전트의 성격을 유저 맞춤형으로 설정 가능 -- 간단한 음성 대화를 통해 유저 성향 파악

처음에는 '알' 제시 -- 사용자 성향에 맞는 캐릭터가 부화



화면1

초기실행 시 화면



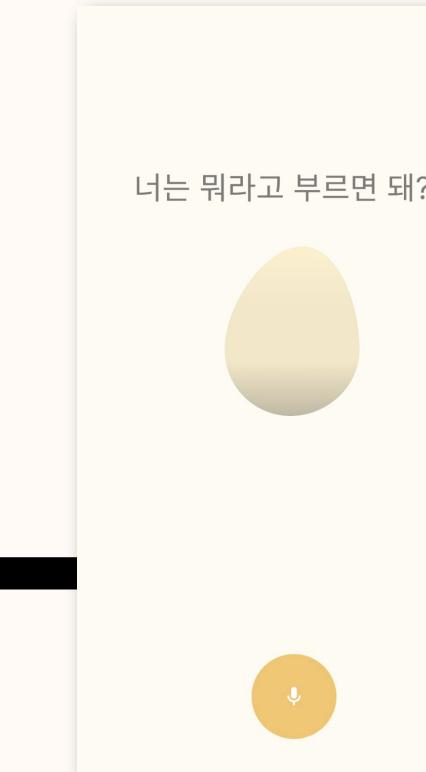
화면2

AI 성격/음성 설정

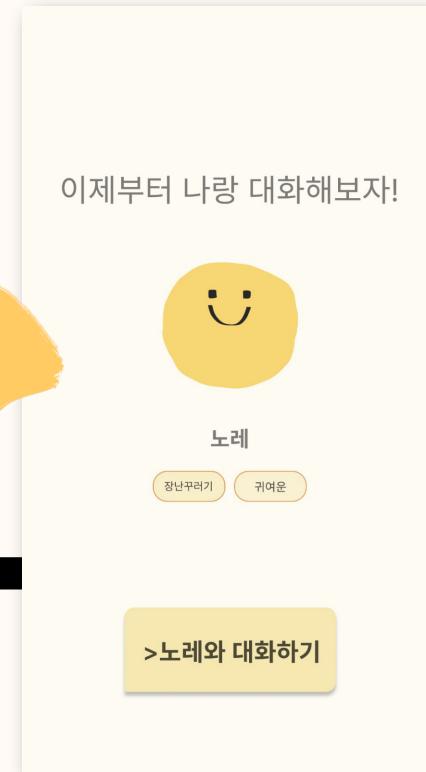


화면3

음성 대화 기반 유저성향 파악
(사용자 호칭, 관심사, 선호 음악 장르 등 간단한 정보)



화면4



화면5

설정 확인

FUNCTION-1 MAIN

지난 기록과 오늘 기록 생성이
한페이지로 압축된 시작화면



UI: 음표, 악보

일주일 동안의 감정적 상태를 음악 모티프 '악보'에 비유해 요약 제시

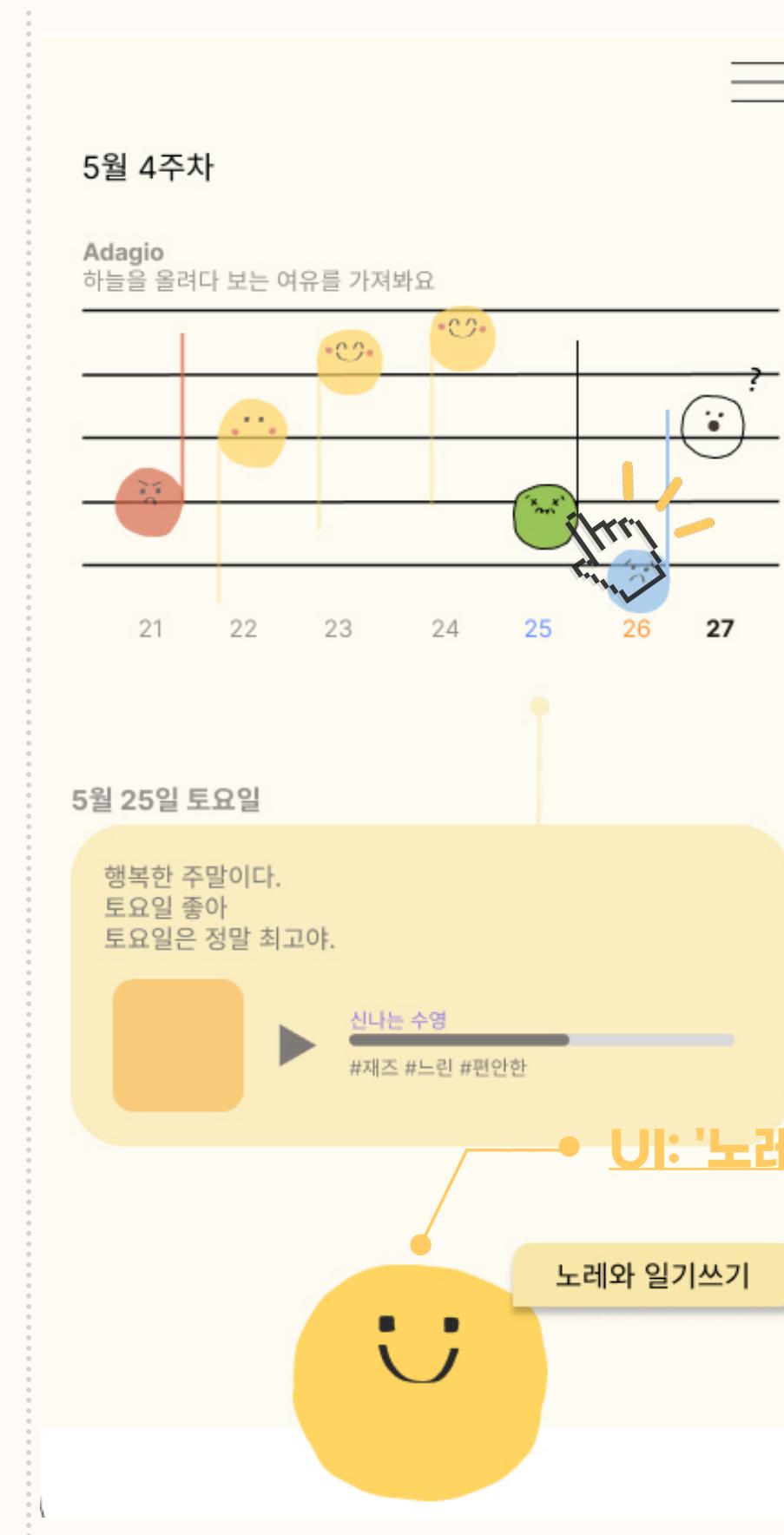
- 오선지 위에 곡의 빠르기를 표현하는 단어를 사용
- 음표에 EMOTICON을 넣음으로써 직관적으로 지난 감정 상태 시각화

주요 기능

- 일주일 동안 작성된 일기, 최근 좋아한 음악 등 한눈에 확인 가능
 - 일주일 동안의 감정 상태를 '악보'에 비유해 요약해 보여줌
 - 터치를 통해 간편하게 최근 일기+음악 접근 및 회고 가능
 - 단순히 통계를 제시하기보다, 서비스 컨셉(노래하는 일기)와 결합 시켜 부담없이 과거 기록을 돌아볼 수 있도록 함
 - 홈 화면에서 '최근 좋아한 음악' 플레이리스트를 제공함으로써 음악 생성 서비스임 강조
- 일기 생성 화면으로 이동 가능
 - 하단의 캐릭터(노래) 버튼을 통해 일기 생성 화면으로 이동
 - 서비스 의인화를 통해 일기 쓰기의 부담 절감

FUNCTION-1 MAIN

지난 기록과 오늘 기록 생성이
한페이지로 압축된 시작화면

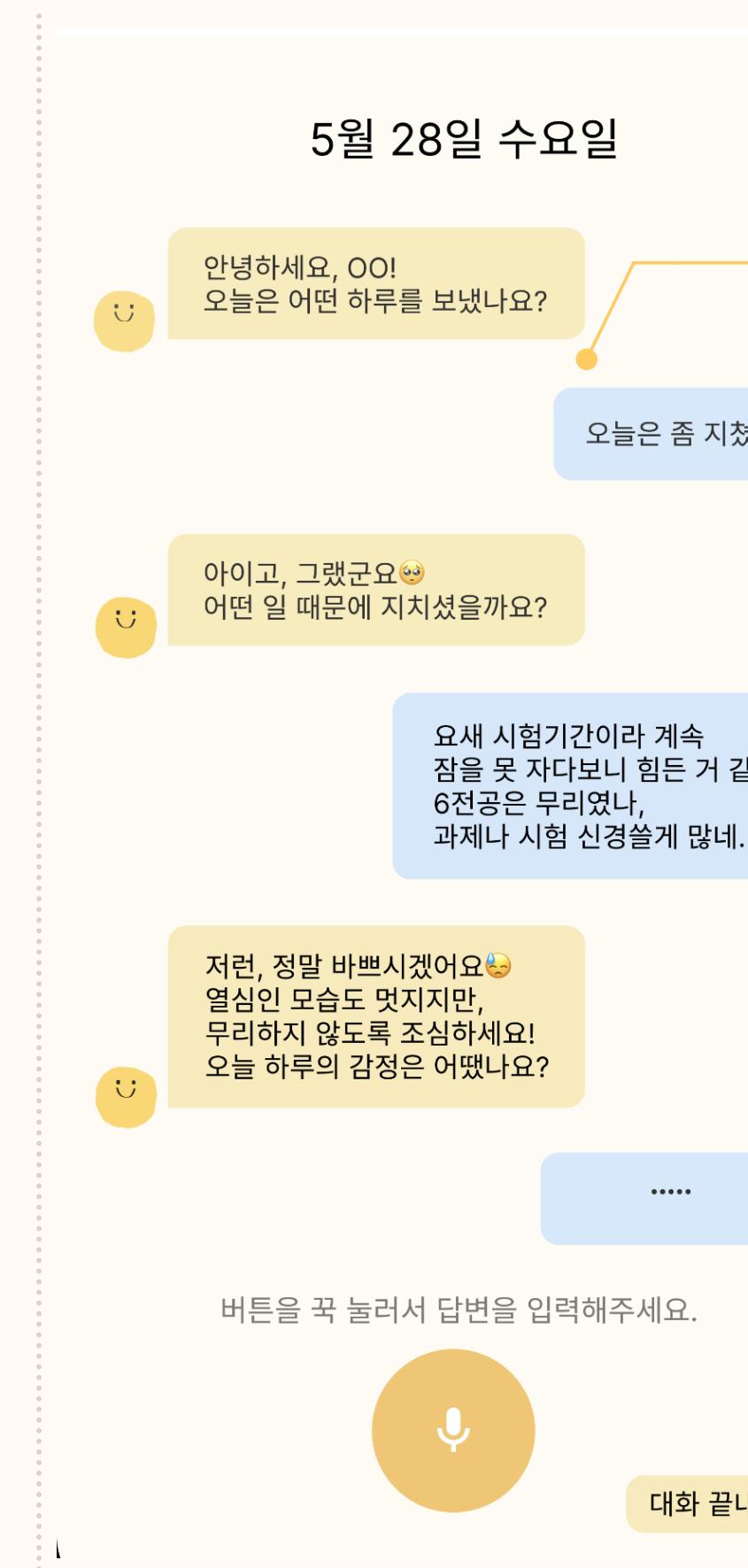


주요 기능

- 일주일 동안 작성된 일기, 최근 좋아한 음악 등 한눈에 확인 가능
 - 일주일 동안의 감정 상태를 '악보'에 비유해 요약해 보여줌
 - 터치를 통해 간편하게 최근 일기+음악 접근 및 회고 가능
 - 단순히 통계를 제시하기보다, 서비스 컨셉(노래하는 일기)와 결합 시켜 부담없이 과거 기록을 돌아볼 수 있도록 함
 - 홈 화면에서 '최근 좋아한 음악' 플레이리스트를 제공함으로써 음악 생성 서비스임 강조
- 일기 생성 화면으로 이동 가능
 - 하단의 캐릭터(노래) 버튼을 통해 일기 생성 화면으로 이동
 - 서비스 의인화를 통해 일기 쓰기의 부담 절감

FUNCTION-2 CHAT

캐릭터 '노레'와의 대화를 통해 하루를 되돌아볼 수 있는 페이지



UI

일기 캐릭터(노레)와 대화하는 느낌이 들도록 채팅 인터페이스 차용

주요 기능

- AI 캐릭터와 하루(일과, 생각, 감정 etc.)에 대해 음성 기반으로 대화
 - 필요시 텍스트로 대화
- 일기작성 및 음악생성을 위한 데이터를 충분히 확보했다 판단되거나, 유저가 대화를 중단하기 원한다면 버튼을 통해 대화 중지
 - 단, 유저가 너무 빨리 대화를 중단하려 할 시 부드럽게 회유 (ex. 캐릭터 발화: '벌써 가는거야?' / 알림: '대화를 짧게 끝내면 내 가음악을 마음에 꼭 들게 못 만들어줄 수도 있어~')
- 유저 데이터(온보딩 데이터, 행동패턴 etc.)에 기반해 캐릭터의 대사, 말투 등 개인화; AI를 활용해 유저에게 최적화된 사용자 경험 제공

FUNCTION-3

MUSIC

&

DIARY

CHAT을 통해 생성된 그날의 음악과
짧은 일기를 확인할 수 있는 페이지



5월 28일 수요일



오전 시험이 긴장했던 것에 비해 쉽게 풀렸다.

앞으로 마음을 편안하게 먹기로 했다.

회의와 모임으로 바빴지만

스프카레가 맛있어서 힘이 나는 하루.

UI

날마다 부담없이 마음을 돌본다는 기획 의도 및 컨셉에 맞게 짧은 글(3~5줄) 생성.
단, 일정 수준 이상 문답이 지속되면 자율성 및 일치감 보장을 위해
그 길이가 비례적으로 늘어날 수 있다.
페이지 열람 시 생성된 음악이 함께 흘러나온다.



편안해요

편안한 하루를 보낸 당신에게 어울리는
Sweet Rest

#재즈 #느린 #편안한

기록 끝내기

⟳ 다시 대화하기

주요 기능

- 유저와의 대화를 바탕으로
그날의 마음상태와 조응하는 음악을 생성하여 제공
- 유저와의 대화를 바탕으로
그날의 일기를 3~5문장 내외의 짧은 글로 요약해 제공
- 생성된 일기나 음악이 마음에 들지 않을 경우 피드백 가능
 - 좋아요/싫어요 버튼으로 간단한 피드백 가능
 - '노래'와의 추가적 대화를 통한 자연어 기반 피드백 가능

FUNCTION-4 HISTORY

이달의 기록(마음상태 및 일기)을
한눈에 확인할 수 있는 단계

히스토리

2024년 4월 ▼

일	월	화	수	목	금	토

4월 28일 목요일

몸 컨디션이 조금 안 좋은 편인 것 같다.
어제 먹은 음식이 문제였나보다.
그래도 내일 일정이 없어서 푹 쉴 수 있어서 다행이다..

신나는 수영

#재즈 #느린 #편안한

UI

달력 형식에 날마다의 마음상을 나타내는 EMOTICON 표시

*가독성을 위해 악보 디자인은 사용하지 않음;

변화하는 캐릭터의 얼굴을 통해 1달치 데이터를 한 눈에 볼 수 있도록 하는데 집중

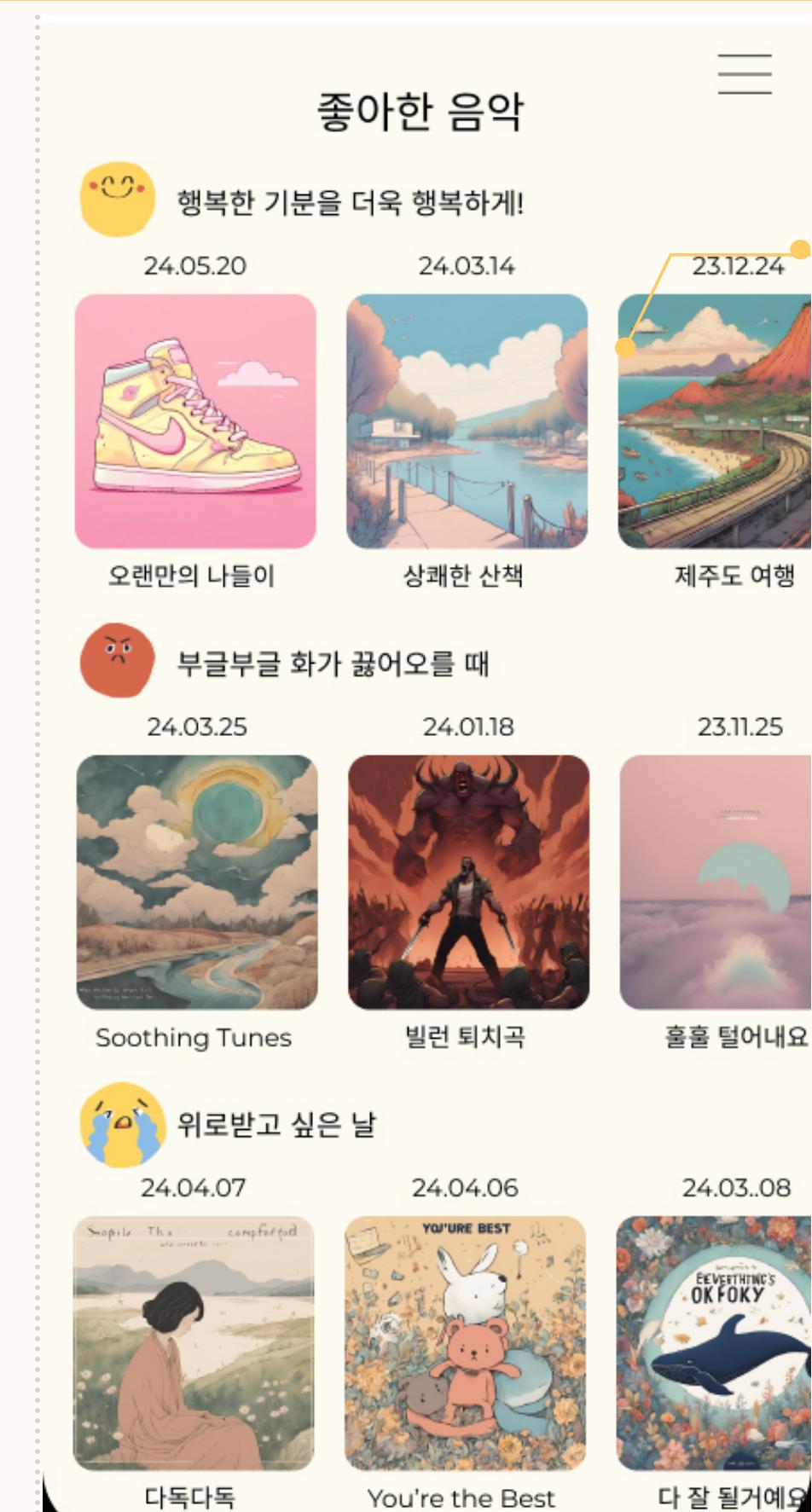
*REF: 하루콩([HTTPS://PLATUM.KR/ARCHIVES/199974](https://PLATUM.KR/ARCHIVES/199974))

주요 기능

- 월 요약
 - 상단의 드롭다운 메뉴를 통해 특정 연월로 이동할 수 있음
 - 홈 스크린에서는 1주일만 볼 수 있었다면,
히스토리에서는 1달의 내용을 확인할 수 있도록 함
- 캐릭터 클릭 시 해당 일자의 일기와 생성된 음악을 확인할 수 있음

FUNCTION-5 LIKED

과거 생성됐던 음악의 플레이리스트
를 확인할 수 있는 페이지



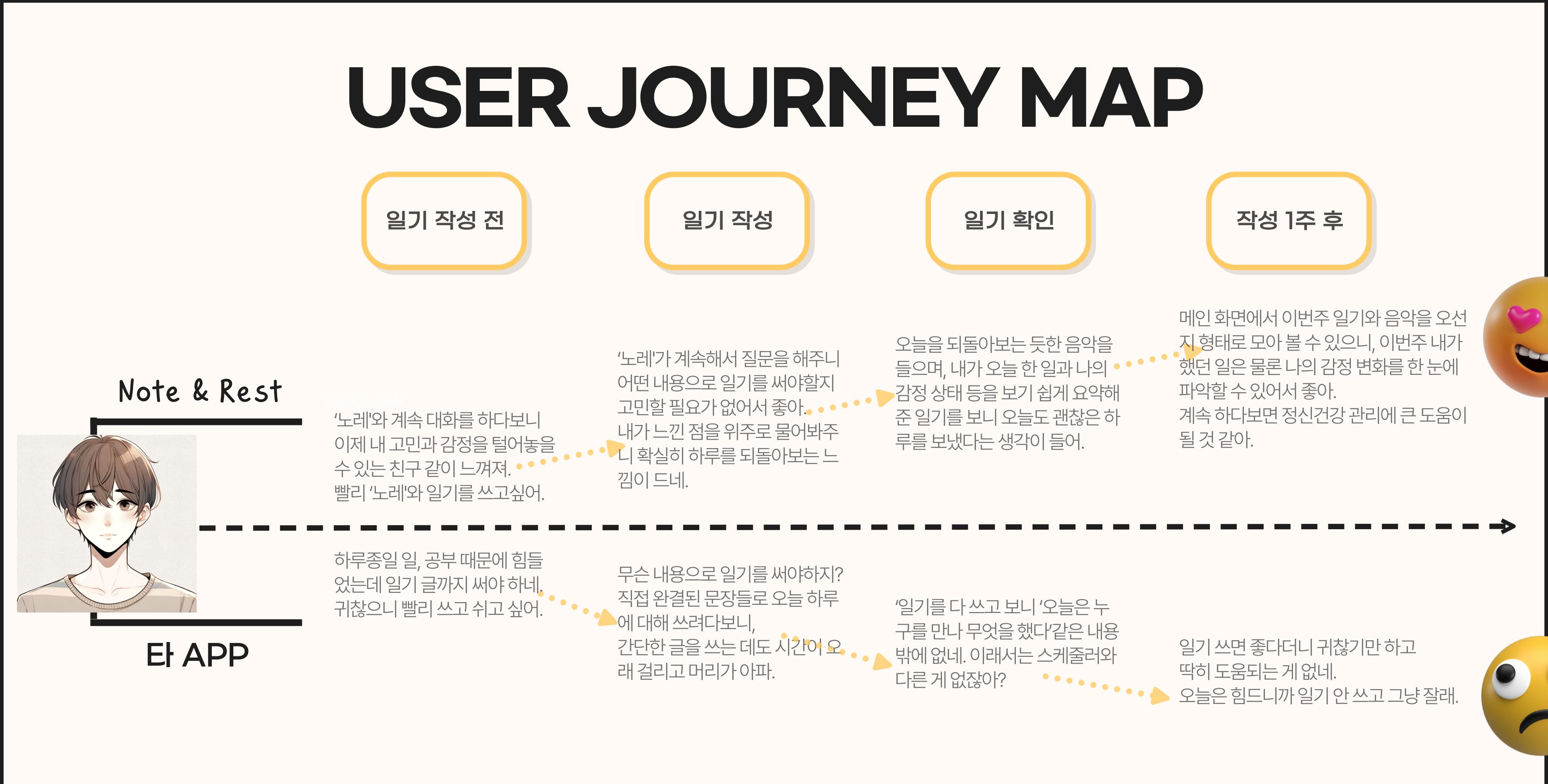
UI

과거 생성됐던 음악을 감정별로 플레이리스트 형식으로 정리

주요 기능

- 생성된 음악을 플레이리스트로 제공
 - 특히, 한 감정에 관련된 음악들을 정리해 제시함으로써
유저는 지금 느끼는 감정에 알맞은 플레이리스트 감상 가능
 - 생성된 음악을 정리된 형태로 확인할 수 있기 때문에
유저가 생성결과에 대한 피드백을 남기기 용이
 - ex. 슬펐던 날 생성해준 음악은 괜찮은데, 기뻤던 날
생성해준 음악은 별로네~

USER JOURNEY MAP



유진

"저를 포함한 모두 창연실 대장정 완주 축하드립니다! 고생하셨습니다!
이번 수업을 통해 AI가 무엇인지 기초부터 다질 뿐더러, AI가 사람을 위해 운용되도록 한다는 것의 의미를 체감할 수 있었습 니다. 정보문화학과의 마침표와 같은 이 수업에서 팀원들과 함께 우리 모두의 마음을 보듬어줄 수 있는 '노래'라는 서비스를 구상할 수 있어 참 좋았어요."

준영

"AI 기술을 활용한 서비스 기획 과정에 대해 심도깊게 배울 수 있어서 정말 뜻깊은 수업이었습니다. 그동안 AI에 대한 기술적 지식에 대해서만 배워 왔는데, 역시나 이를 응용해서 새로운 서비스를 만들고 발전시키는 과정은 기술적 지식과는 별개라는 것을 배우게 되었습니다. 팀원분들, 그리고 다른 학우분들 모두 고생 많으셨습니다!"

느낀 점!

지인

"AI에 대해 막연하게만 느꼈던 부분이 많았는데, 직접 사용자 중심 AI 서비스를 기획해보면서 구체적으로 어떤 부분이 중요 할지에 대해 학습할 수 있었습니다!
한 학기 동안 많은 부분 배울 수 있어 감사했고, 같이 좋은 결과물 만들어주신 팀원 분들 수고 많으셨습니다~!"

혜원

"팀원들과 어떻게 하면 사람들이 하루의 끝을 편안하게 마무리할 수 있을까 진지하게 고민하고 의견을 나누는 과정 자체가 마음이 따뜻해지는 시간들이었던 것 같습니다!
또 AI, 특히 LLM이 사람을 위한 서비스에 적용될 수 있는 다양한 가능성들에 대해 탐구할 수 있어 즐거웠어요.
<노래>뿐만 아니라, 다른 학우분들이 구상한 서비스들 모두 꼭 실현되었으면 좋겠습니다!"



E.O.D

감사합니다.

