2023
SCEWC KOREA Pavilion

C

Medical Healthcare

BioBrain Co., Ltd

01 AI-based sleep quality and sleep posture detection solution

BIOBRAIN
We Dream Your Dream!

09

BIOBRAIN
We Dream Your Dream!

Company Name	***BioBrain Co., Ltd***
CEO	Kiseong Kim
Name	Hyeunsnag Kim
Tel	010 4338 3647
Fax	
E-mail	khs@biobrain.kr
URL	https://biobrain.kr/

Company Introduction

Starting with the establishment of a corporation in February 2013,
BioBrain has developed biological signal measurement systems such as electroencephalogram and electromyogram,
It has a wide base technology for bio-medical imaging systems, bio-bio-signal measurement systems based on bio-information analysis system technology.

also,
We are preparing for a wider business by utilizing recent trends such as artificial intelligence technology, IoT, cloud system, big data, and based technologies, and developing technologies that integrate our biometric system and IT technology.

BioBrain is taking the lead in growing into a creative company that realizes everyone's dreams under the slogan We Dream Your Deram.

2023 SCEWC KOREA Pavilion

01

AI-based sleep quality and sleep posture detection solution

Technology / Product	AI-based sleep quality and sleep posture detection solution
Detailed Genre	AI convergence technology(Processing Artificial Intelligence)
Product Type	Smart sleeping mat app
Target Company	
Technology/Product video link	

Contents Introduction

Overview
With more than 8 million elderly people living alone, such people often suffer from severe health problems.

I started to solve it as a developer because there are many people who die alone in situations where there are many people who do not receive proper treatment or care at the right time.

Features and Benefits
You don't have to wear any equipment on your body.
Heart rate and breathing can be measured without wearing medical equipment.

Development of a system that alerts you to emergency situations or before health problems occur during sleep.

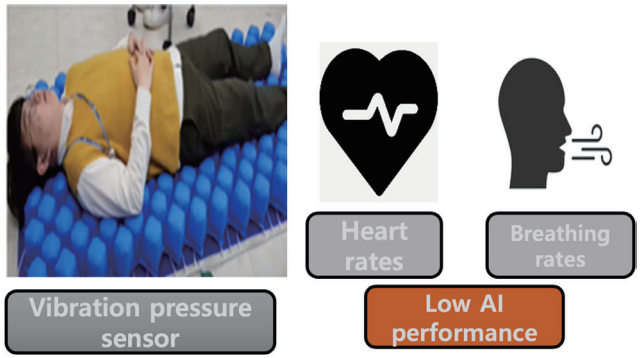
Heart rate is measured based on vibration, so heart rate and breathing can be measured using pressure sensor and piezo sensor FSR sensor even when wearing clothes.

Processing intelligence >>

AI-based sleeping quality monitoring and sleeping posture sensing solution

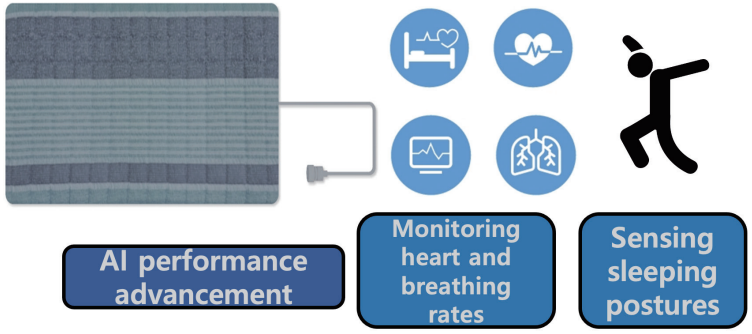
AS-IS

Digital health care device that measures heart and breathing rates by using body vibration pressure sensors on the smart mat



TO-BE

Additional development of AI solution that analyzes and classifies different postures of users by using sensors



Classification	AS-IS	TO-BE	Expected Effects
Sleeping quality monitoring	Bio-signals (heart and breathing rates) Fall short of AI solution performance with F1-Score 75%	Bio-signals (heart and breathing rates) Advancement of AI solution with F1-Score 85%	Presenting health management index by measuring users' sleeping bio-signals, sensing sleeping postures, and analyzing sleeping quality and bio-rhythm
	Fall short of AI-based sleeping posture sensing performance	Development of sleeping posture sensing solution that measures FSR sensor data and image data at the same time	
Sales of related products	KRW5 million/month	KRW10 million/month	Expecting over 50% of sales increase per a month
Sleeping bio-signal analysis accuracy	F1-Score 75%	F1-Score 85%	Sleeping quality improvement effect by sensing sleeping postures
Note	• Advanced solution that creates a bio marker which reflects sleeping quality through measuring and analyzing bio-signals (measuring heart and breathing rates) • Development of a customized sleeping posture sensing solution that measures FSR sensor data and image data together to meet the requirements of the demand company		

10

Inviz

Inviz Co.

01	FER(Facial Expression Recognition)
02	NGS(Next Generation Sequencing) Data analysis
03	Web PACS

Company Name	***Inviz Co.***
CEO	Sung-Chul Park
Name	
Tel	+82-1644-3751
Fax	+82-62-434-2633
E-mail	
URL	https://inviz.co.kr/

Company Introduction

We are a research and development and sales distributor of medical image information delivery systems, medical image acquisition systems and related medical Image artificial intelligence systems.

Starting in 2012, we have been working hard to create profits by improving the quality of the medical imaging system and linking related businesses.

It is a company that improves, tries, and challenges with a better living environment.

By understanding the needs of the market and considering the step-by-step, clear, careful consideration and ways to maximize customer benefits and value, we are committed to creating value for our choice.

The ultimate value is happiness, and you can get as close as you can to a play that can never be done, and the value to self-fulfillment.

Achieving the value of a happy life is our ultimate goal.

Creating a corporate culture that respects individuals, praises diversity, and delights in change.

01

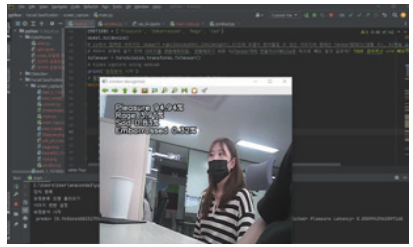
FER(Facial Expression Recognition)

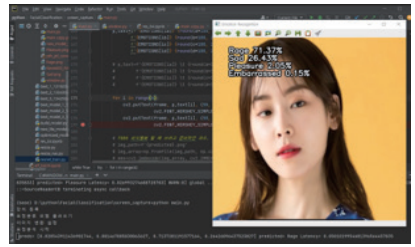
Technology / Product	FER(Facial Expression Recognition)
Detailed Genre	Image Classification
Product Type	Software
Target Company	D2Resource
Technology/Product video link	

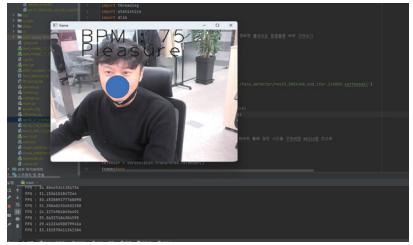
Contents Introduction

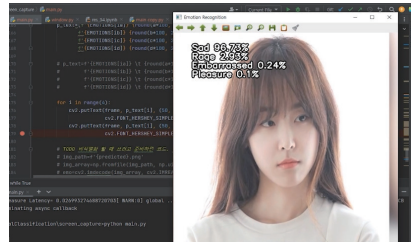
Facial expression recognition is a computer vision task aiming for identifying and categorizing emotional expressions, heart rate, oxygen saturation and stress score displayed on a human face.

We can offer a suitable AI model with many different specifications depending on your purposes and operating environments.









02

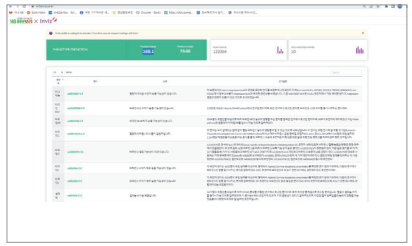
NGS(Next Generation Sequencing) Data analysis

Technology / Product	NGS(Next Generation Sequencing) Data analysis
Detailed Genre	Diagnostic AI
Product Type	Software
Target Company	Herbbori
Technology/Product video link	

Contents Introduction

NGS Data analysis is A solution to predict human phenotypes by integrating biological data into mutation data examined in human genomes.

You can get your height growth and weight increase expectation values by importing a NGS data(vcf file).



rsid	Title	
rs2282679-A-A	비타민 D 부족증에 걸릴 가능성이 적어짐	rs2282679은 염색체 4p12에 위치한 group-specific compon...
rs2282679-A-C	비타민 D 수준이 약간 낮음	rs2282679은 염색체 4p12에 위치한 group-specific compon...
rs2282679-C-C	비타민 D 수준이 낮음	rs2282679은 염색체 4p12에 위치한 group-specific compon...
rs12785878-G-G	비타민 D 부족증에 걸릴 가능성이 적어짐	rs12785878은 11q12 염색체에 위치한 7-디하이드로콜레스테롤 환원효소 D...
rs12785878-G-T	비타민 D 부족증에 걸릴 확률이 1.2배 증가함	rs12785878은 11q12 염색체에 위치한 7-디하이드로콜레스테롤 환원효소 D...
rs12785878-T-T	비타민 D 부족증에 걸릴 확률이 1.4배 증가함	rs12785878은 11q12 염색체에 위치한 7-디하이드로콜레스테롤 환원효소 D...
rs10741657-A-A	비타민 D의 수준이 높음	rs10741657은 염색체 11p15의 cytochrome P450, family...
rs10741657-A-G	비타민 D 수준이 약간 낮을 가능성	rs10741657은 염색체 11p15의 cytochrome P450, family...
rs10741657-G-G	비타민 D 수준이 낮을 가능성	rs10741657은 염색체 11p15의 cytochrome P450, family...
rs33972313-G-G	혈장의 비타민 C의 수준이 정상임	이 연구는 유럽 전사적 암 예방 조사단(European Prospective Inv...
rs33972313-G-A	혈장의 비타민 C의 수준이 낮을 가능성	이 연구는 유럽 전사적 암 예방 조사단(European Prospective Inv...
rs33972313-A-A	혈장의 비타민 C의 수준에 문제가 있을 가능성	이 연구는 유럽 전사적 암 예방 조사단(European Prospective Inv...

03

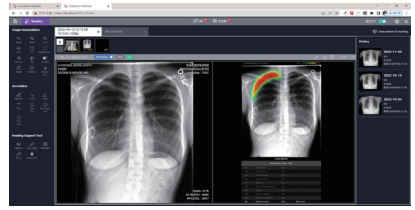
Web PACS

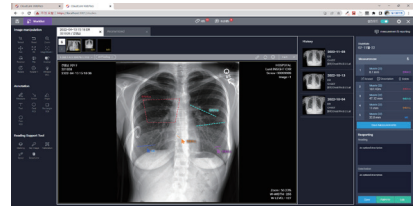
Technology / Product	Web PACS
Detailed Genre	PACS System
Product Type	Web Page
Target Company	
Technology/Product video link	

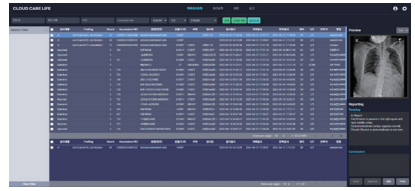
Contents Introduction

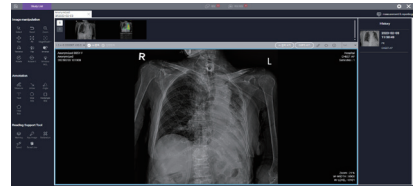
Inviz WebPACS is a web-based application for managing medical image diagnosis. Accessible from PCs or mobile devices, it eliminates the need for complex installations, enabling users to access it anywhere. Physicians can remotely examine medical images with ease.

The exam list offers a user-friendly UI, search filters, image previews, and diagnostic reports. The image viewer includes essential PACS functions, annotation tools, DICOM-related tools, and a diagnose report feature.
Our real-time video chat feature allows users to collaborate on diagnosis anywhere.









Emotion analysis with face image >>

AI solution for healthy tea recommendation by analyzing emotions based on face images

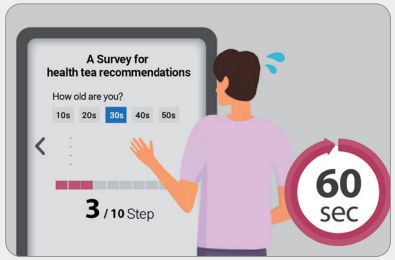
AS-IS

1st year

Healthy tea order method in a form of questionnaire stage by stage takes over one minute and difficult to complete

2nd year

Making questions about customers' current state of feeling simple through AI emotion analysis and decrease in time taken for product order accordingly (from 60 to 30 sec. on average)



TO-BE

Making questions simple by using AI emotion analysis and bio-signal measuring results and decrease in time taken for order accordingly (from 30 to 15 sec. on average)
Sales increase by 50% (KRW10 million=> KRW15 million/month)

Classification	AS-IS, 1st year	AS-IS, 2nd year	TO-BE
Healthy tea order time	Customer questionnaire type order method (about 60 sec.)	Order time decrease by 50% through AI emotion analysis (about 30 sec.)	Order time further decrease by 50% (decrease by 75% in total, about 15 sec.)
Drinks recommendation based	Customer questionnaire type emotion diagnosis	Customer questionnaire and AI emotion diagnosis results (over 80% of accuracy, 4 types of emotions)	AI emotion diagnosis and bio-signal measuring results (over 90% of accuracy, bio-signals such as a heart rate, blood oxygen saturation, stress level, etc.)
Target sales	KRW10 million/month	KRW12 million/month	KRW15 million/month
Expected technical effect	AI technical skill improvement of the demand company - Expanding available data by acquiring face image data		

Genetic information analysis >>

depression inference and customized healthy drinks recommendation service

AS-IS

1st year

Healthy foods recommendation system using customers' questionnaire,
Absence of genetic analysis service which uses NGS

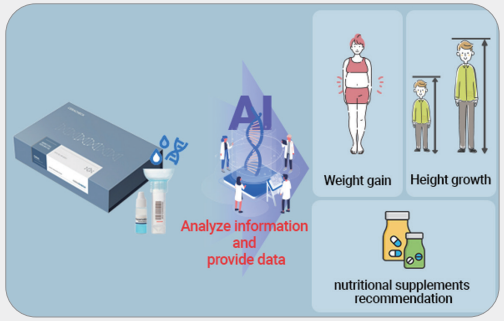
2nd year

Healthy foods recommendation system using customers' questionnaire,
Absence of genetic analysis service which uses NGS

TO-BE

Genetic information-based healthy foods recommendation,
- Genetic information relevant to weight increase and height growth
- Information about lacking nutrients

Providing systemetic and scientific consulting



Classification	AS-IS, 1st year	AS-IS, 2nd year	TO-BE
Healthy foods recommendation system	Healthy foods recommendation using the results of customer's questionnaire	Recommending products of height growth / weight control based on AI analysis	Recommending products of height growth / weight control based on AI analysis and customized nutrient supplements
The number of customers interested in the products	The number of visitors to the homepage: about 22,000 people	The number of visitors to the homepage: about 23,000 people About 5% increase in the number of customers interested in the products	The number of visitors to the homepage: about 25,000 people About 10% increase in the number of customers interested in the products
Relevant products sales	KRW40 million/month	KRW50 million/month	KRW60 million/month
Providing genetic information	None	Providing genetic information relevant to weight increase and height growth	Providing genetic information relevant to weight increase and height growth Providing information about lacking nutrients
Expected technical effect	AI technology transfer to the demand company - Obtaining data through genetic data analysis		

2023 SCEWC KOREA Pavilion

10

Tmax

TmaxAI Development Center

01 Improvement solutions of voice quality

02 Healthcare Service Platform

Company Name	*TmaxAI Development Center*
CEO	Myungae Park
Name	Tae Soo Yoon
Tel	+82-10-4575-1270
Fax	
E-mail	taesoo_yoon@tmax.co.kr
URL	https://www.tmax.co.kr/

Company Introduction

Tmax group is the only total software company in Korea and established twelve subsidiaries in order to implement the whole spectrum of technologies that recent times requires. Approximately 75% of employees are comprised of R&D and IT engineers to accomplish our goals.

Since its establishment in 1997, Tmax has been reorganizing the large software market globally. In particular, we maintains a high market share of our core middleware products and an unequaled position in the market.

Based on our strong background with core technologies and R&D capabilities, Tmax Group is bringing the whole cumulative twenty six-year technologies together to create Life Care Platform.

Tmax AI Development Center is an Enterprise Research Institute established in 2021 by Tmax AI to develop independent artificial intelligence technologies such as visual, voice, conversation, and document intelligence for various AI-based convergence services. Major products include data AI models for Deep-learning, improvement solutions of voice quality and healthcare service platforms.

01

Improvement solutions of voice quality

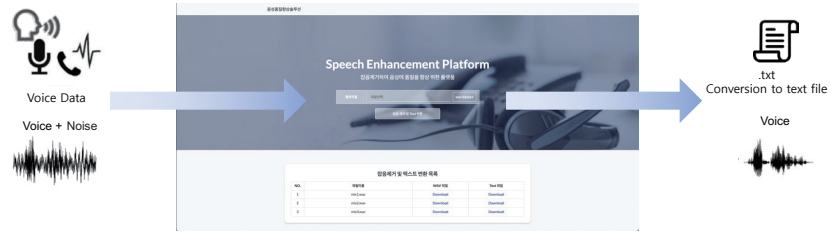
Technology / Product	Improvement solutions of voice quality
Detailed Genre	Provides AI-based voice recognition, noise elimination and automatic voice-text switching services
Product Type	Web
Target Company	Companies to build AI Call Center, Voice Solution Providers, Voice Dataset Builders
Technology/Product video link	

Contents Introduction

"Tmax AI-based Voice Quality Improvement Solution" leverages artificial intelligence to improve the clarity and quality of voice data in various environments, including noisy and congested spaces. Also, it is a voice quality improvement and text conversion automation solution elevated by the own text-conversion technology of Tmax, to apply and utilize in voice recognition AI chatbots.

AI-based voice quality improvement and text conversion technologies have enormous applicable potentialities in various industries, including voice communication companies, tech start-ups, audio conference service providers, educational institutions, and healthcare providers. For instance, noise eliminating in offline lectures enables to improve clarity when they go to online lectures and automatically converts voices into texts to make it easier for for the hearing-impaired students to understand.

As voice recognition technology becomes more sophisticated and consistently evolving, it is expected to be adopted to a wide range of environments and use cases. Tmax Artificial Intelligence Development Center will continuously provide high-quality voice services to customers and end users and ultimately improve overall customer experience and satisfaction.



02

Healthcare Service Platform

Technology / Product	Healthcare Service Platform
Detailed Genre	Providing personal health care/disease care/hospital management services
Product Type	Web-app
Target Company	Individuals, CROs, Medical Institutes, etc.
Technology/Product video link	

Contents Introduction

Tmax Healthcare Services Platforms provide individuals with personal health care services focused on predicting and preventing diseases by analyzing personal health records (PHR) based on real time activities.

We aim to help medical staffs more focusing on medical practices and deliver insights into hospital operations by providing extended platforms that can easily introduce innovative new technologies such as AI and metaverse into hospital environments.

Personal Healthcare	Disease Care	Hospital Management
		
Disease predicting and preventing AI service	Overcome all limitations of disease care	Provide operation solutions to more focus on treatment
Prediction of possibilities developing to diseases	Supportive AI prognosis	Real-time healthcare consultation with AI
Support daily life health combining exercise and AI	Patient communities by each disease	Provide marketing and HR tools
Provide senior-care based on IoT	Disease management in metaverse	Telehealth patient-consultation

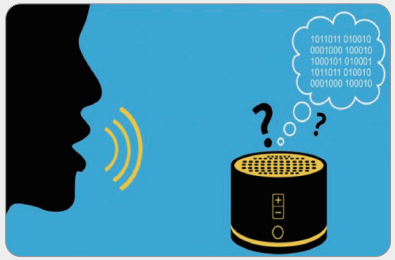
Intelligent processing >>

AI-based audio quality improvement solution

AS-IS

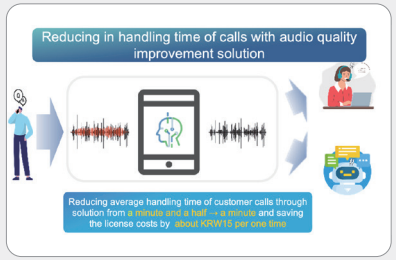
Before adoption

Recognition errors created due to different level of noises in audio speeches, generating wrong speech analysis results



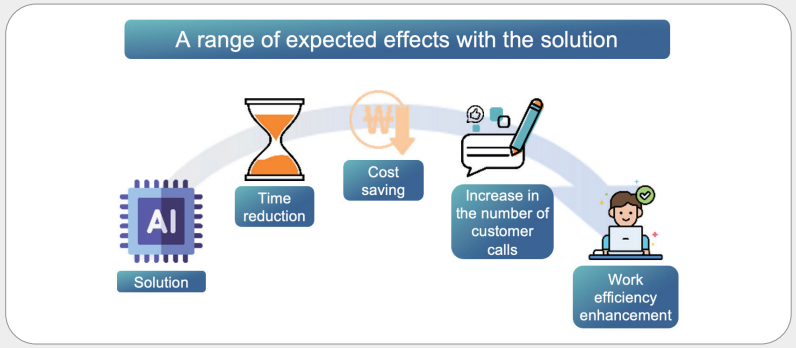
1st year

Decrease in the number of recognition errors, reduction in average time of handling customer calls with audio quality improvement, and saving costs related to licensing through the solution



TO-BE

Advanced audio quality improvement technology (SNR 40dB → 50dB) and confirmed CER evaluation indexFurther decrease in average handling time for customer calls and other expected effects



Classification	AS-IS		TO-BE	Expected Effects
	Before adoption	1st year	2nd year	
Customer call handling time	About three minute taken on average in handling one customer call at the AI customer center	Demonstrating with results at the second year for demand company's reasons	Average handling time for a customer call at an AI customer center reduces to about two minutes and 52 seconds after audio quality improvement (5% reduction)	Increase of the quality of customer call handling attributed to reduction of wasting time caused by recognition errors
Saving fees for license	Audio improvement solution licensing fees, KRW15/30 seconds	Solution on-board = Zero in licensing fees	Solution on-board = Zero in licensing fees	Production cost saving of KRW3 million (annually)
Audio speech quality	About 5dB of SNR (Signal-to-Noise Ratio)	About 40dB of SNR (Signal-to-Noise Ratio)	About 50dB of SNR (Signal-to-Noise Ratio)	Achieving over 90% of recognition accuracy with audio quality improvement (refer to the table below)

Noise \ SNR(dB)	-50	-30	-20	-15	-10	-5	0	5	10	15	20	30	50
Voice													
Voice_male	15.8	16.6	20.3	25.1	35.2	53.6	71.7	85.5	93.7	97.4	99.5	100.2	100
Voice_male(syn)	15.4	16.1	19.3	23.2	32.8	49	67.1	81.1	91.5	96.4	98.7	99.9	99.9
Voice_female	15.4	15.7	19.9	25.7	32.4	42.6	57	72.3	84.5	91.9	96.3	99.8	100.1
Voice_female(syn)	15.9	16.6	21	26.1	34.1	46.8	62.1	77.5	88.5	95.3	98.7	100	99.9
Voice (Avg.)	15.6	16.2	20.1	25	33.6	48	64.5	79.1	89.5	95.2	98.3	100	100

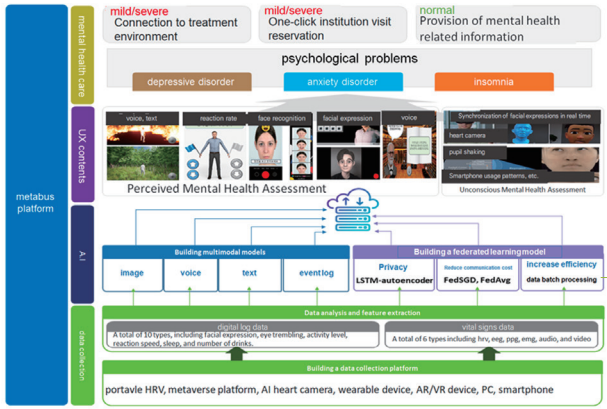
Journal of Knowledge Information Technology and Systems(JKITS),
Vol. 15, No. 6, pp. 973-981, December 2020,
p.5 - Table2. Relative test accuracy(%) in the presence of the disturbing noises

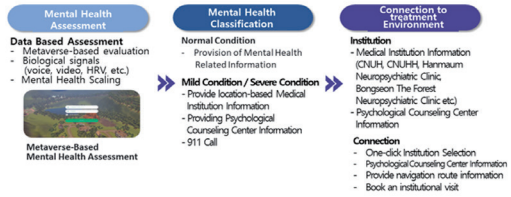
<Ministry of Employment and Labor Customer Service Center Operation Status by Year>

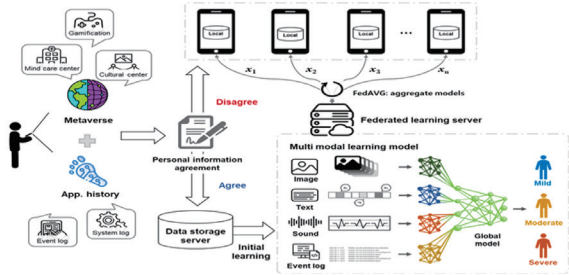
(Unit: persons, cases, %)

Year	Counseling staff	Draw-in	Response rate	Intake per person	Processing time per case	Establishment of the next-day callback system granted
2017	348.0	8,077,133	92.3	23,210	2minutes 55seconds	Grant
2018	334.1	9,604,962	81.4	28,749	2minutes 57seconds	Grant
2019	334.7	9,783,109	75.9	29,229	2minutes 57seconds	Grant
2020	324.4	10,346,025	64.0	31,893	3minutes 4seconds	Grant
2021	400.7	9,302,015	70.7	23,214	3minutes 3seconds	Grant
August 2022	392.0	5,366,194	71.3	13,689	3minutes 2seconds	Grant
합계	2133.9	52,479,438	75.7	24,593	3minutes	Grant

Sources: https://m.oheadline.com/articles/TuNDJeLr90_K0G20x92r2g==







ICHOR Co., Ltd.

01 AI, Metaverse

02 AI, App

12

Company Name	ICHOR Co., Ltd.
CEO	Kim Namjun
Name	KIM Jin-nam
Tel	010-5217-5793
Fax	050-2989-9451
E-mail	jn.kim@ichor.ai
URL	www.ichor.ai

Company Introduction

ICHOR Co., Ltd. was established on March 3, 2020 to develop solutions for mental care in an AI-based metaverse environment.
ICHOR Co., Ltd. develops a Mental Health MEDverse platform based on a metaverse security model that is not limited by time and space for early detection of risk groups that are not exposed and reduction of social prejudice barriers without fear of invasion of privacy, and utilizes technology as a collaboration system with medical staff at university hospitals. raising the star The development of the Mental Health MEDverse platform based on the metaverse security model is as follows.

1. Mental health-related biological signal analysis and evaluation technology AI model development
2. Metaverse Environment Individual data collection and development of monitoring system
3. Development of digital phenotypic log creation contents
4. Building digital log-based learning data and developing mental health assessment technology AI model using digital log

By applying metaverse technology that transcends space limitations, accessibility and convenience are increased in the field of mental health medicine, and mental care solutions are provided through medical validation of the Mental Health MEDverse platform as a hospital collaboration system and hospital demonstration service.

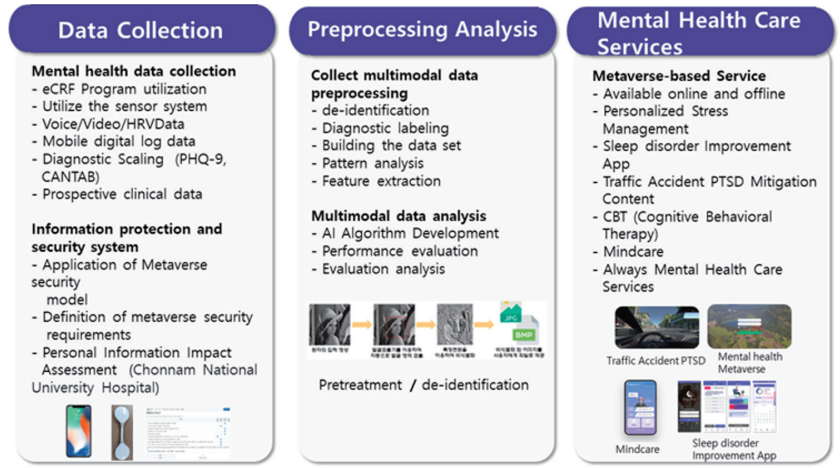
01

AI, Metaverse

Technology / Product	AI, Metaverse
Detailed Genre	
Product Type	
Target Company	
Technology/Product video link	

Contents Introduction

Mental Health MEDverse Platform
1. Collect data on mental health classification in metaverse virtual space for mental care
2. AI algorithms deliver personalized healing solutions with data preprocessing and analysis systems
3. Development of stress relief content provides various mental health care services



02

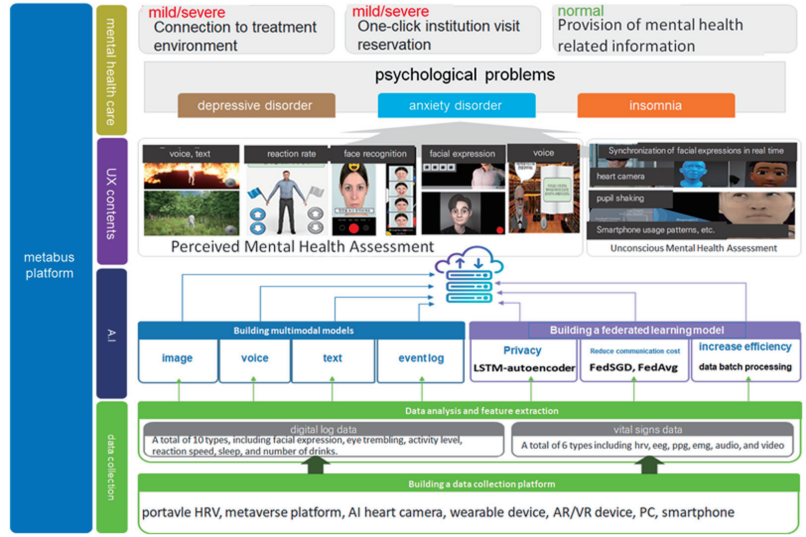
AI, App

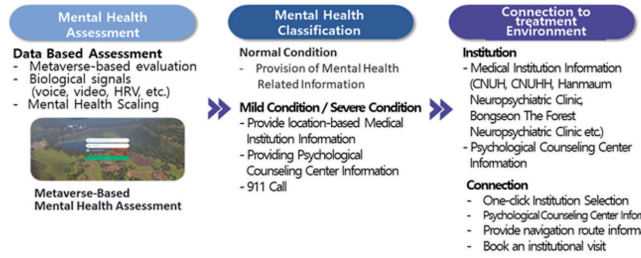
Technology / Product	AI, App
Detailed Genre	
Product Type	
Target Company	
Technology/Product video link	

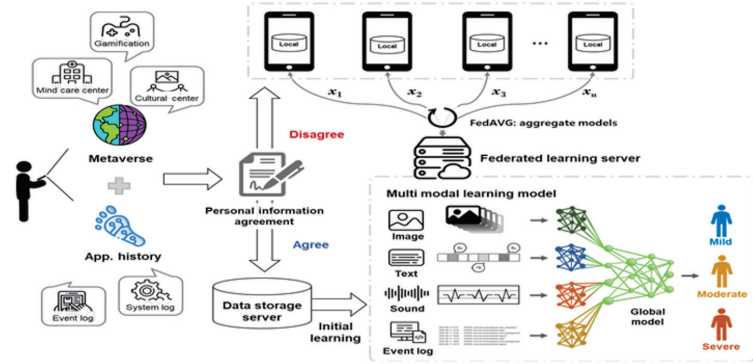
Contents Introduction

Intelligent health functional food recommendation solution APP.
Personalized health functional food recommendation solution by analyzing personal diseases using AI algorithms(Gradient Boosting) for correlation and effectiveness analysis between data such as medication information, medical history, health examination results, and vaccination details.

< Composition of intelligent health functional food recommendation solution >







Inference intelligence >>

depression inference and customized healthy drinks recommendation service

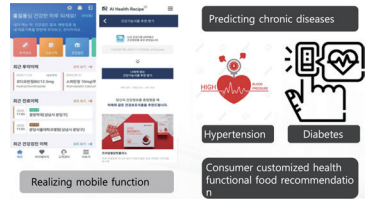
AS-IS

Before adoption

A few years late in opening of the shopping mall compared to competitors, No system to strengthen purchasing power for members

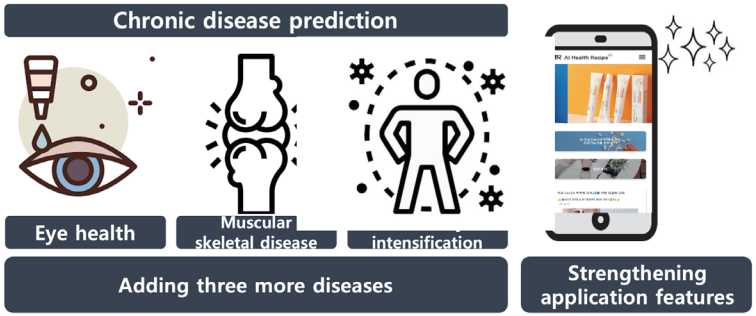
1st year

Strengthening purchasing power by differentiating the shopping mall from competitors with an app that recommends corporate items to consumers suitable for their health conditions



TO-BE

Enhancing actual sales of the demand company by expanding the scope of product lines of recommendation along with additional prediction about chronic diseases



Classification	AS-IS		TO-BE	Expected Effects
	Before adoption	1st year	2nd year	
Shopping mall operation	Operating mainly closed type site mall	Adopting health functional food recommendation solution	Expanding product lines for health functional food recommendation	Expanding product lines for recommendation by adding a chronic disease prediction feature
System establishment	Shopping mall access through web homepage	Adopting AI-based app for health functional food recommendation	Strengthening AI-based chronic disease prediction feature	Diversifying product lines for recommendation by strengthening a chronic disease prediction feature and sales increase
Functional foods sales	KRW1.8 million for 2 weeks before the adoption of the system	KRW2.2 million for 2 weeks after the adoption of the system	KRW2.35 million for 2 weeks after the adoption of the system	Sales increase by 7% as compared to the 1st year based on data from TTA
Number of visitors to the company-operated shopping mall	4,350 people/ month	5,000 people/ month	5,250 people/ month	Increasing the share of shopping mall with the rise of the number of visitors to the company-operated shopping mall (increase by 5% as compared to the 1st year) Increase of indirect sales thanks to the rise of the number of visitors
Customer satisfaction	Satisfaction survey result: 60.57 point	Satisfaction survey result: 98.52 points	-	Increasing user satisfaction after the adoption of the service
Accuracy of health functional food recommendation	F1- Score 75%	F1- Score 80%	F1- Score 85%	Enhancing confidence by using customers' medical data, My Data (certified by Koreans Standard Association)
Velocity	-	Within 2 sec.	Within 1 sec.	Increasing data analysis velocity

2023 SCEWC KOREA Pavilion

DaiShin Information & Communications Co., Ltd

01	AI-based childcare counseling ChatBot service
02	Depression inference and customized health drink recommendation service
03	Insomnia inference and customized health functional food recommendation service
04	DSIC Industrial Smart PDA

DSIC
DaiShin Information & Communications Co., Ltd

13

DSIC
DaiShin Information & Communications Co., Ltd

DSIC
DaiShin Information & Communications Co., Ltd

Company Name	*DaiShin Information & Communications Co., Ltd*
CEO	Lee Jae-won, Choe hyeon-taek
Name	Lee Dong-kyu
Tel	010-9627-0116
Fax	062-226-0716
E-mail	dklee@dsic.co.kr
URL	http://www.dsic.co.kr/

Company Introduction

Since its foundation in 1987, Daishin Information & Communication has contributed to the creation of business value for customers by providing ICT services based on system construction experience in various industries such as public, defense, finance, and manufacturing.
Our company is strengthening its expertise in cloud, big data, artificial intelligence, and the Internet of Things, which are core technologies needed in an era when the industrial ecosystem is rapidly changing due to the convergence and hyperconnectivity between businesses in the 4th Industrial Revolution.
Based on our many experience in building various business ICTs and understanding of the work environment, we will continue to grow to become an expert company that supports our customers' successful digital transformation.
Everyone at DSIC will cooperate with our partners based on fairness and trust, and always make ethical choices to take part in corporate social responsibilities and become an ESG leading company.

01

AI-based childcare counseling ChatBot service

Technology / Product	AI-based childcare counseling ChatBot service
Detailed Genre	AI convergence technology(Processing Artificial Intelligence)
Product Type	Platform with ChatBot
Target Company	A consulting firm
Technology/Product video link	

Contents Introduction

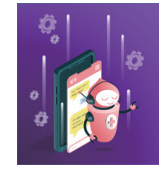
Understanding natural language based on machine learning and keyword extraction. Recognizing the user's intentions, emotions, and language, presenting answers and forming a consensus.

1) Using a BERT-based language model
- Improved model structure for lighter model
- Lightweight technology (ex: MobileBERT) for faster processing

2) Implementation of AI-based customized life timetable presentation function
- Based on user input data, the recommended time-line for each baby's age and Measure similarity, analyze life patterns, and present a customized life timetable.

3) Provide demand management pages for convenience of consultation and information management
- Develop unrecognized question extraction and learning tools for learning questions that fail to answer.

4) Childcare Support Project Information Service
- Guidance on regional childcare support projects through chatbots
- Information on projects by type of support (salary and allowance, childcare support, health support, etc.)
- Provide links to details and application pages




02

Depression inference and customized health drink recommendation service

Technology / Product	Depression inference and customized health drink recommendation service
Detailed Genre	Machine Learning AI Model
Product Type	Service
Target Company	A company that sells mental health-related products
Technology/Product video link	

Contents Introduction

We provides AI services that help diagnose diseases by determining the importance of characteristics necessary for determining diseases among numerous examination result records.

1) Model learning is carried out using reliable actual hospital data.
   - In order to improve service reliability, health examination items used for mental health diagnosis such as depression and insomnia currently used in hospitals were used.

2) Using the ExtraTrees Classifier Decision Tree Model
   - We extracted the most important questionnaire items using Feature Importance ExtraTreesClassifier Decision Tree Model Learning Progress

3) Use critical questionnaires in 7 key categories: SSD, UCLA, ISI, PSS, etc.
   - We organized the questionnaire items with questions that have a great influence on depression reasoning such as stress, insomnia, personality, loneliness, and social support.

4) As a result, demand companies can quickly determine whether their customers are depressed or not, and recommend their own products accordingly.

03

Insomnia inference and customized health functional food recommendation service

Technology / Product	Insomnia inference and customized health functional food recommendation service
Detailed Genre	Machine Learning AI Model
Product Type	Service
Target Company	A company that sells mental health-related products
Technology/Product video link	

Contents Introduction

We provides AI services that help diagnose diseases by determining the importance of characteristics necessary for determining diseases among numerous examination result records.

1) Model learning is carried out using reliable actual hospital data
   - We have increased reliability by using medical examination items used for mental health examinations such as depression and insomnia currently used in hospitals.
   - Data security is enhanced through self-secure coding and model learning in closed environments.

2) Using the ExtraTrees Classifier Decision Tree Model
   - We used the ExtraTrees Classifier decision tree model to learn. In addition, we calculated the risk level so that we could intuitively judge the risk level.

3) Use critical questionnaires in 7 key categories: SSD, UCLA, ISI, PSS, etc.
   - Composition of questionnaire items with questions that have a great influence on depression reasoning such as stress, insomnia, personality, loneliness, and social support.

4) Finally, through our service, the demand company can determine whether the customer has insomnia or not in very less time than the existing insomnia judgment of insomnia. They can also recommend products from demand companies based on the results.

04

DSIC Industrial Smart PDA

Technology / Product	DSIC Industrial Smart PDA
Detailed Genre	Industrial PDA
Product Type	Solution / Portable equipment
Target Company	An enterprise that performs sales, material management, access management, etc. in wholesale and retail stores, distribution centers, transportation, healthcare, and defense
Technology/Product video link	

Contents Introduction

Daishin Information and Communication Co., Ltd. manufactures smart PDAs that perform sales and material management, access management, and location tracking in wholesale and retail stores, distribution centers, transportation, healthcare, and defense.

Based on the technology and product stability that we have accumulated since 2007 when we first started our business, we are continuously recognized by thousands of domestic and foreign customers.

Daishin Information and Communication Inc.'s smart PDA solution is especially useful in industries where you have a workforce that spends most of your time outdoors, or where your work environment includes harsh environments.

Device failures and breakages that occur during work in harsh environments lead to productivity loss due to disruptions.

Daishin Information and Communication Inc. Smart PDA allows users to experience greater reliability and productivity gains than using consumer products. This will result in lower costs and higher productivity for companies.

DSIC
DaiShin Information & Communications Co., Ltd

Inference intelligence >>

depression inference and customized healthy drinks recommendation service

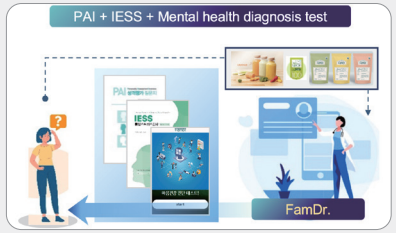
AS-IS

Before adoption

- Recommendation/sales of healthy drinks through simple promotion and consultation
- Solution required that helps utilize customers health information

1st year

- Examining customers' mental health state (depression, stress) using complex questionnaire
- Sharing health condition and recommending healthy drinks based on the results of examination



TO-BE

- Recommending natural health drinks and improving web services through advanced mental health tests.
- Expect 20% improvement in sales of healthy drinks with 85% or more inferences accuracy tests.
- Expect to generate 200 million won in revenue by improving customer satisfaction.

Category	AS-IS		TO-BE	Expected Effects
	Before adoption	1st year	2nd year	
Increase of healthy drinks sales	About KRW 35 million	About KRW 40 million	About KRW 48 million (20% increase targeted)	Increased sales by more than 20% after introducing advanced services Expected to generate revenue of 200 million won
Time required for depression examination	IESS(stress), PAI(feeling of depression) examination About 33 min. on average	About 2 min. taken from inferring depression to recommending healthy drinks	About 2 min. taken from depression inference to healthy drinks recommendation	The time taken for examination to be maintained by adding more questions to enhance the type and accuracy of the questionnaire
Expanding consumer base by providing an AI questionnaire service	Absence of analysis data on the major consumer base	Current consumer base of the demand company is mainly middle-aged and elderly people (over the age of 40)	Expanding consumer base by adopting AI questionnaire service to make the homepage more advance (from teenagers to over the age of 50)	Securing new customers through an AI service for 5-minute depression diagnosis, offering health information, easy payment, and subscription service
Satisfaction level of users on depression inference tests (mental health diagnosis test)	NA	86/100 points	90/100 points	Increase of user satisfaction on depression inference tests (mental health diagnosis test) and the renewed homepage
Depression inference accuracy	75%	84%	Over 85%	Enhancing the accuracy of depression inference and customer confidence with advanced model which performs new medical data learning
Notes	• Customized service adoption by utilizing the depression inference solution to the platform of the demand company • Health state inference through customer questionnaire and recommending customized healthy drinks through AI analysis		• Advancing depression inference tests by adding more questions → providing precise health information through thorough analysis • Enhancing user satisfaction by upgrading the homepage of the demand company and conducting promotional activities	

Conversation intelligence >>

AI-based infant care chatbot service

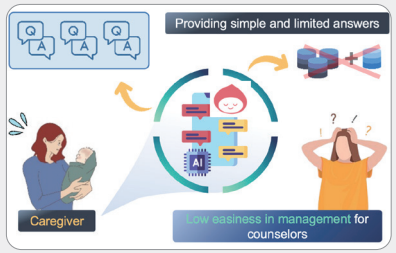
AS-IS

Before adoption

- Direct performing the entire process of infant care counseling by a professional counselor
- Happening of waiting for a long time even for simple advice

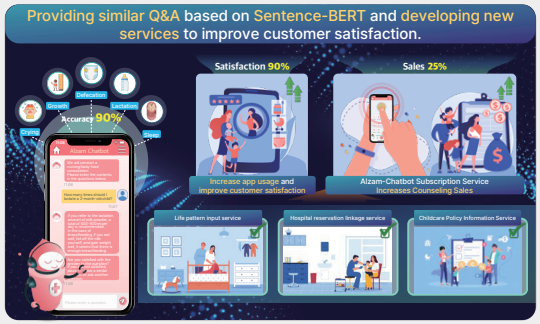
1st year

- Providing simple answers to questions and limited scope of questions and answers
- Difficulties in managing chatbot consulting details and adding new data of questions and answers



TO-BE

- Advancing solutions and developing three new services for caregivers.
- Chatbot with 90% accuracy in conversation analysis is expected to increase consultation sales by 25%.
- Expect to generate 576 million won in profits by improving customer satisfaction.



Category	AS-IS		TO-BE	Expected Effects
	Before adoption	1st year	2nd year	
Revenue from consultation	None	Annual average revenue in 2022, about KRW 40 million	About KRW 50 million (by 25% increase targeted)	Max. KRW576 million of profit expected (per a year)
Monthly app users on average	The number of participating sessions, 87,177 times The number of events, 826,301times Retention time on the app, 20 min. 44 sec.	The number of participating sessions 90,000 times The number of events, 840,000 times Retention time on the app, 22 min.	The number of participating sessions, 97,000 times The number of events, 900,000 times Retention time on the app, 25 min.	Increase by 7.7% in the number of participating sessions Increase by 7.1% in the number of events Increase by 13.6% in the retention time on the app
User satisfaction on infant care consultation chatbot service	None	86/100 points	90/100 points	User satisfaction increase with new service for infant care consultation chatbot and chatbot channel
Average consulting time on phone	45 min.	35 min.	Maintaining the current	Realizing a service model that provides counseling on phone as well as through chatbot
Conversation analysis accuracy	None	82%	90%	Providing proper answers by a professional infant care counselor with 90% of accuracy to caregivers' questions
Notes	• KRW80,000 of current consulting fee per one-time (one-week analysis based) • Expecting revenue increase with the start of subscription service after the adoption of AI chatbot		• Expanding user service by playing a role as an infant care agent and expecting the number of membership • Expecting the improvement of counselors' quality on consultation by supporting manager dashboard operation and using chatbot consulting data	

2023 SCEWC KOREA Pavilion

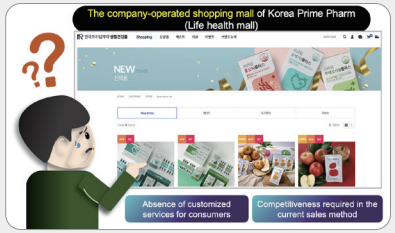
Inference intelligence >>

Insomnia inference and customized health functional food recommendation service

AS-IS

Before adoption

- Selling health functional foods on a company-operated shopping mall
- A solution needed to provide customized recommendation service for the products

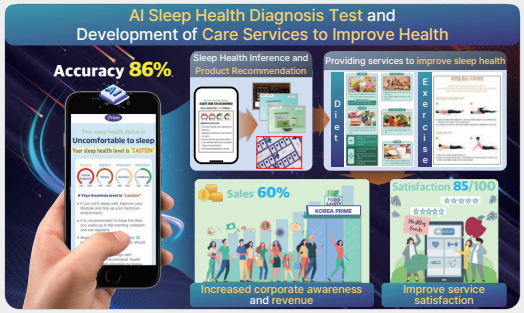


1st year

- Predicting insomnia by checking the health state of customers after conducting a simple questionnaire
- Additional service required to expand consumer base by providing a service that improves insomnia of customers

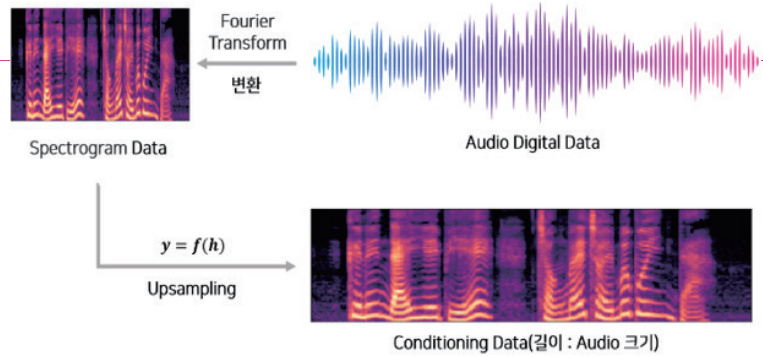
TO-BE

- Insomnia Reasoning AI Learning Advancement and Health Information Provision Page Development.
- Expect 60% improvement in health food sales through tests with an inference accuracy of 85% or higher.
- Expect to generate 240 million won in revenue by improving customer satisfaction.



Category	AS-IS		TO-BE	Expected Effects
	Before adoption	1st year	2nd year	
Health functional foods sales	KRW600,000/ month	KRW900,000/ month	KRW1.5 million/ month	Monthly sales of health functional foods increased by 60% Expected to generate 240 million won in revenue (annual basis)
Number of visitors to the online shopping mall	4,350 people/ month	4,800 people/ month	5,200 people/ month	Enhancing the share of online shopping mall by increasing the number of visitors on the company-operated shopping mall (up by 9% as compared to the monthly average)
User satisfaction on insomnia inference tests	None	None	85/100 points	Securing high user satisfaction on insomnia inference tests and service pages
Insomnia inference accuracy	75%	82%	Over 85%	Enhancing the accuracy of insomnia inference through new medical data learning and additional consumers
Notes	• Health functional foods recommendation based on AI model with high accuracy • Expecting the rise of customer satisfaction by recommending suitable products to customers		• High accuracy of the advanced model as compared to that of the 1st year and increasing the number of questions about heath conditions of customers • Increasing consumer confidence and satisfaction by improving access to the service pages • Improving the level of completion on services by providing information about exercise, diet and health for insomnia improvement	

2023 SCEWC KOREA Pavilion



14

inDJ

01	Music recommendation streaming radio service that analysis user's situation and emotion by AI
02	Voice emotion recognition
03	Textmining emotion recognition

Company Name	*inDJ*
CEO	Wooju Jung
Name	Hanbyul Kim
Tel	+82-10-2019-6428
Fax	
E-mail	joshyyy@indj.net
URL	https://indj.ai/

Company Introduction

- Indie band launched success model combining music and artificial intelligence after establishment.
- When we were preforming as an Indie band at the past we have been interacting with good musicians. We were inconvenienced about them disappearing due to the domestic distribution structure.
- Existing music streaming service (platform) businesses mostly distribute only to musicians belonging to their agencies, so local musicians does not have the opportunity to promote their creative activities.
- However, the recent trend is that people in teens and twenties strongly tend to find music that suits their taste and listen to it. Some good musics are found later and make a comeback on the chart. Consumer's needs and trends are changing but there is a lack of music streaming services (platforms) to follow this trend.

01

Music recommendation streaming radio service that analysis user's situation and emotion by AI

Technology / Product	Music recommendation streaming radio service that analysis user's situation and emotion by AI
Detailed Genre	Auto Labeling (Music wavelength analysis, lyrics language analysis), Point of interest pattern analysis, Sentiment analysis
Product Type	App Service(Android, iOS), AI Solution (SaaS)
Target Company	Entertainment Corp., Music Streaming Service platform, EV market
Technology/Product video link	None

Contents Introduction

- **Service function**
  - Music recommendation streaming radio service by user's situation and emotion
    - · Using portable devices such as smart-watches and smart-phones we collect the user's current situation and emotion (Context Awareness) and based on the information the service (platform) recommends music, channels, broadcasts that users want to listen.
    - · The system classify the characteristics of a music by it's lyrics and musical characteristics that give emotions, infer the emotions of users then recommends music. As a method of analyzing a user's emotional pattern, 1) infer by connecting the user's specific situation and emotions, or 2) infer through analysis of the pattern of music emotions recently heard.

< Analyze user's situation >

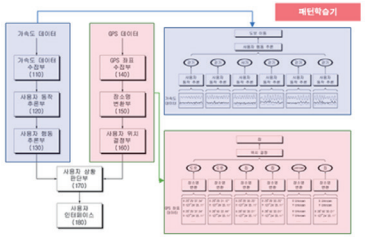
< Analyze user's emotion >

< MCN music broadcast >

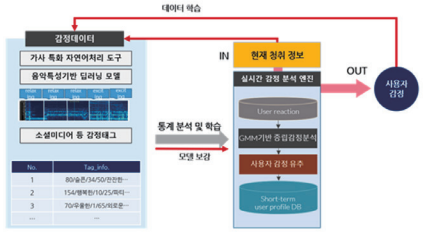
● **Service main technology**

1) Recommending system through user's emotion and situation

- Perceive the user's pattern and condition by terminal sensor
  · Using GPS information the service sets-up the user's attractive places like home, school, work place then recommend the right music for the right place.
- Making a engine to predict the emotion by listening patterns
  · Making a engine to predict the emotion by gathering listening records from the app, mixed model algorithm that analyses user's emotion, and context-aware behavior inference system.



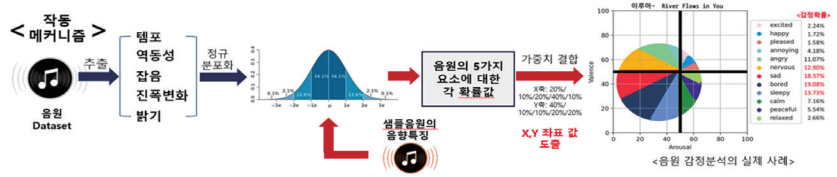
< Naive Bayes-based situation-aware inference system >



< Engine to predict the emotion by listening patterns >

2) Music Labeling technology based on AI

- Deep Learning model predicting instrument factors
  · In the sound source, the composition of the instrument can be an indicator of the atmosphere and distinguishing detailed genres. The characteristic value is extracted from the spectrum through the Hanning window function. Then the Bayes' classification algorithm finds the musical instrument signals, and implements a model that can mathematically determine which musical instrument is used.
- Computer engine for emotion classification based on sound source feature.
  · Statistical analysis the tempo, dynamism, noise when we can feel emotion in music.



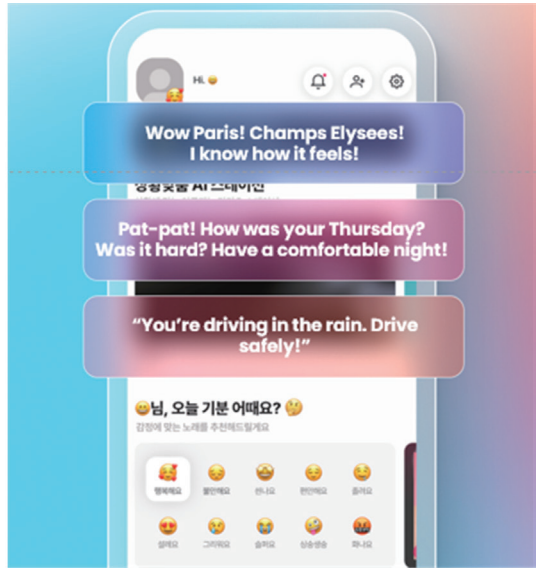
< Method of emotion classification >

- Deep learning model for genre classification
  · Using the already developed analysis module such as BPM and instrument composition combine with the spectrum extraction library of Python, extract

대분류 / 소분류	팝(POP)	랩/힙합	R&B/Soul	일렉트로닉	락	메탈	재즈
총 54개 세부장르	Adult	Hiphop	Contemporary	Electronic pop	Brit	Slash	Jazz_pop
	Folk	Alternative	Neosoul	Club	Modern	LA metal	Smooth
	Pop	Southern	Swing R&B	House	Grunge	Melodic	Swing
	Dancepop	West	Funk and disco	Techno	Garage	Death	Bebop
	Teenpop	East		Trans	Punk	Newmetal	Cool
	Latino	Hardcore		Ndd	Post	Core	Free
	Country	Oldschool		Lounge	Hardrock		Fusion
	Indiepop	Hiphop_jazz		M-bient	Progressive		Acid
		turntable			Blues rock		Latin

[음악 장르 세부분류 표]

< Deep learning model for genre classification >



02

Voice emotion recognition

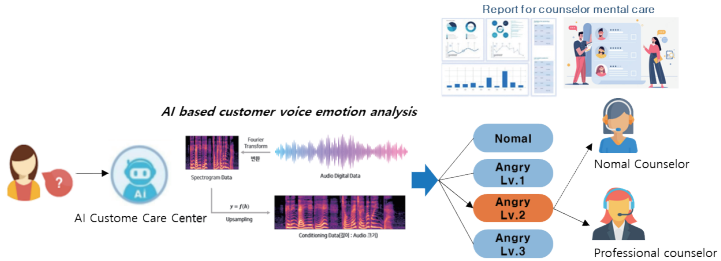
Technology / Product	Voice emotion recognition
Detailed Genre	Fast Fourier Transform(FFT) / Convolutional Neural Networks(CNN)
Product Type	AI Solution (SaaS)
Target Company	Mental Disease Care Hospital / Untact Application Corporate
Technology/Product video link	None

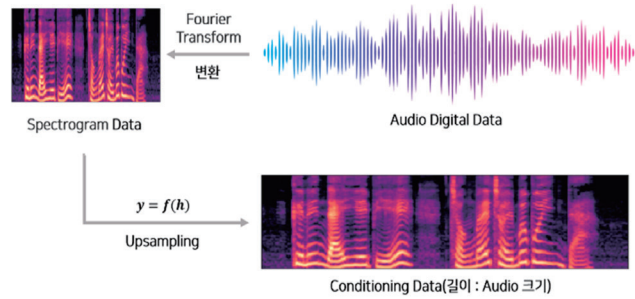
Contents Introduction

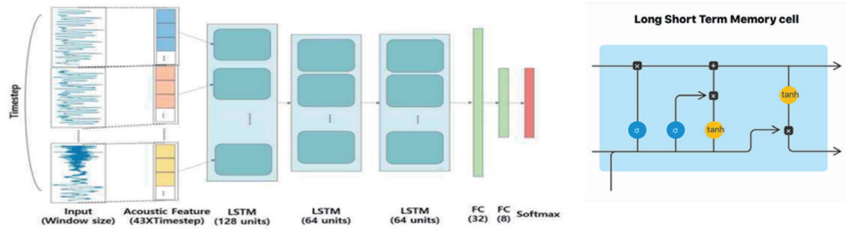
Voice Emotion Recognition Solution is applicable to MRC Automated Q&A System which is a service that receives customer consultation details from the AI customer center and automatically answers them. However, when a customer needs a professional answer, he or she must connect to a general counselor, and at this time, the counselor is exposed to abusive language and sexual harassment through angry customers or black consumers, and there is a high probability that the counselor will fall into mental danger. In order to solve this problem, it is necessary to take precautionary measures to determine the customer's emotional state in advance through the voice of the call and connect it to a professional counselor who can cope with it.

By applying AI-based customer voice emotion analysis technology, AI analyzes the customer's emotions (anger, stress, etc.), makes a judgment on its own, connects it to a dedicated counselor, and manages and records the counselor's stress according to the customer's anger to reduce the counselor's stress.

For this solution, we developed a model that extracts feature points through customer voice data and infers emotions through them.
In addition, a voice emotion recognition model using deep learning can be configured to recognize the customer's anger emotion.







03

Textmining emotion recognition

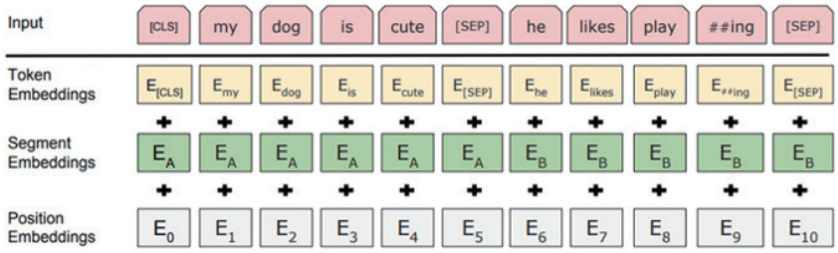
Technology / Product	Textmining emotion recognition
Detailed Genre	STT(Speech to Text), Language Translation, NLP(Natural Language Processing)
Product Type	AI Solution (SaaS)
Target Company	Mental Disease Care Hospital / Untact Application Corporate
Technology/Product video link	None

Contents Introduction

The text mining emotion recognition solution is a technology applied to stress healing counseling services. It is a service that reduces stress by recommending customized music according to the stress of the user who enters the healing room through technology that translates Korean dialect into standard language and emotion recognition through text mining emotion recognition from user's dialogue.

It is a solution that can provide healing content tailored to the user's situation and emotions by introducing an AI emotion recognition model and relieve user's stress.

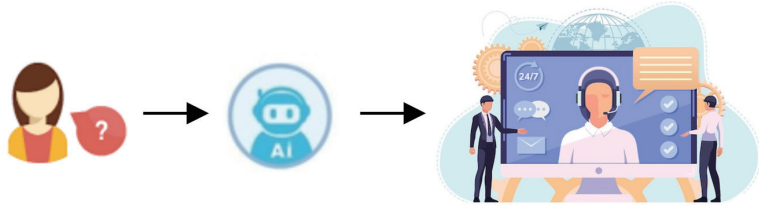
For this solution, 2.5 million 'Korean dialect utterance' data in AI Hub were used for deep learning, and dialect sentences were divided into word phrases, and synonyms were read and finally applied to the translation model. In addition, the BERT deep learning model was used for text-mining emotion recognition, and data pre-processing was performed such as tokenization, sentence segmentation, and word positioning.



Using AI to detect the anger emotion >>

AI-based Speech Emotion Recognition (SER) solution

AS-IS



Problems 1. No service available for customer service agents to manage their stress caused by the anger of customers.

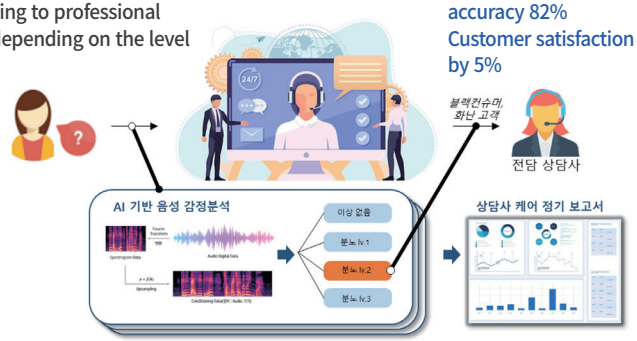
Problems 2. Absence of technology that classifies and records the state of anger.

Problems 3. Necessity of reports regularly created based on logs of customers' emotion state to care mental health of agents

TO-BE

Adopting the AI SER model, Connecting to professional agents depending on the level of anger

Anger emotion detection accuracy 82%
Customer satisfaction increase by 5%



Using AI SER to predict customers' emotion of anger and help agents handle the situation accordingly

Classification	AS-IS	TO-BE	Expected Effects
Black consumer response measure	Handled by an agent responsible for the black consumer only after a general agent experiences the anger of the customer	Angry customers classified by AI to be handled by the agent responsible for angry customers	Recognizing the level of customers' anger beforehand and prevent the situation where agents get stress
Accuracy of anger emotion detection	Accuracy of anger emotion detection 70%	Accuracy of anger emotion detection to be improved to 82%	The state of emotion can be recognized in real time during communication on phone Accuracy improvement (by 12% as compared to the previous rate)
Operation cost reduction (expected annual profit)	Constant rise in operation costs of stress management facilities for agents	Annual reduction in direct/ indirect expenses related to stress management facilities operation by easing stress of agents	Amount of savings (effect of cost reduction over KRW3 million per a year) Product sales improvement by 100%

2023 SCEWC KOREA Pavilion

AI emotion recognition >>

Emotion recognition solution using AI text mining

AS-IS

Before adoption

Emotion recognition using audio data analysis (accuracy 74%)
Absence of music content at the demand company's products (stress healing room)

1st year

Emotion recognition using audio data analysis (accuracy 77%)
Rise in the product satisfaction with the provision of music content (90.5%)

Text analysis emotion recognition

Healing music recommendation solution

TO-BE

Text-based emotion recognition (accuracy over 85%)
Product satisfaction increase (90.5% ~ 95.5%)

1. Translation of all regional dialects into standard language
2. Text-based stress level classification model
3. Music recommendation solution provided based on stress level

Classifying stress by level to provide contents tailored to users for relieving stress

Classification	AS-IS		TO-BE	Expected Effects
	Before adoption	1st year	2nd year	
Emotion recognition method	Audio data analysis (speech waveform, etc.) Over 74% of emotion recognition accuracy	AI text mining Over 77% of emotion recognition accuracy	About 55 seconds taken on average in handling one customer call at the AI customer center after solution advancement	Accuracy enhancement (by 8% as compared to the previous rate)
Dialect translation	No applicable function	Adding a function of translating Jeolla province dialect	Solution on-board = Zero in licensing fees	
Various emotions classification	Before adoption: No applicable function (classifying only as normal/ abnormal)	Classifying six emotions in total (delight, sadness, anger, anxiety, depression, embarrassment)	Solution on-board = Zero in licensing fees	Various emotions classification feedback (classifying two -> six emotions) Healing music recommendation by stress level
Music contents recommendation and matching	Before adoption: No applicable function (mainly videos)	Music recommendation based on six emotions	About 50dB of SNR (Signal-to-Noise Ratio)	Target of product sales increase by 100%
Satisfaction rate on demand company's product	Before adoption : 78.7%	90.5%	About 3.3% of CER (Character Error Rate) (about 4.3% when evaluated with Google STT CER)	