Creating Impact with AI

Impactive AI Service

We are innovators making new impacts
with artificial intelligence to make the future greater

Impactive AI

Machine Learning Based Prediction Solution for Enterprise

Impactive AI

Companies' "Hidden distress"

64% of companies experience inventory loss

64%

have experiences of Inventory loss

Inventory Shrinkage

Overstocked

Impactive AI

Repeated management issues

Management costs and stress caused by failure to match inventory

- Accumulation of losses due to “overstock”
- Stress from “out of stock” and the emergency response
- Trust from customers will be sacrificed If supply can not fulfill demand
- Working-level workers are stressed because it takes a long time to place orders and manage inventory

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Why does this problem happen?

The cause is ‘failure of prediction’

- Out of stock due to failure to predict order volume
- New product demand forecast failure

Most management is a **post-hoc** method

Each company is trying to make its own predictions

Existing prediction methods remain limitation in their accuracy

- Limitation of existing statistical methods
- Most companies are focused on predictions in the past, limiting the usability of the field
- Lack of insightful predictive information (index)

New opportunity

Prediction will solve them

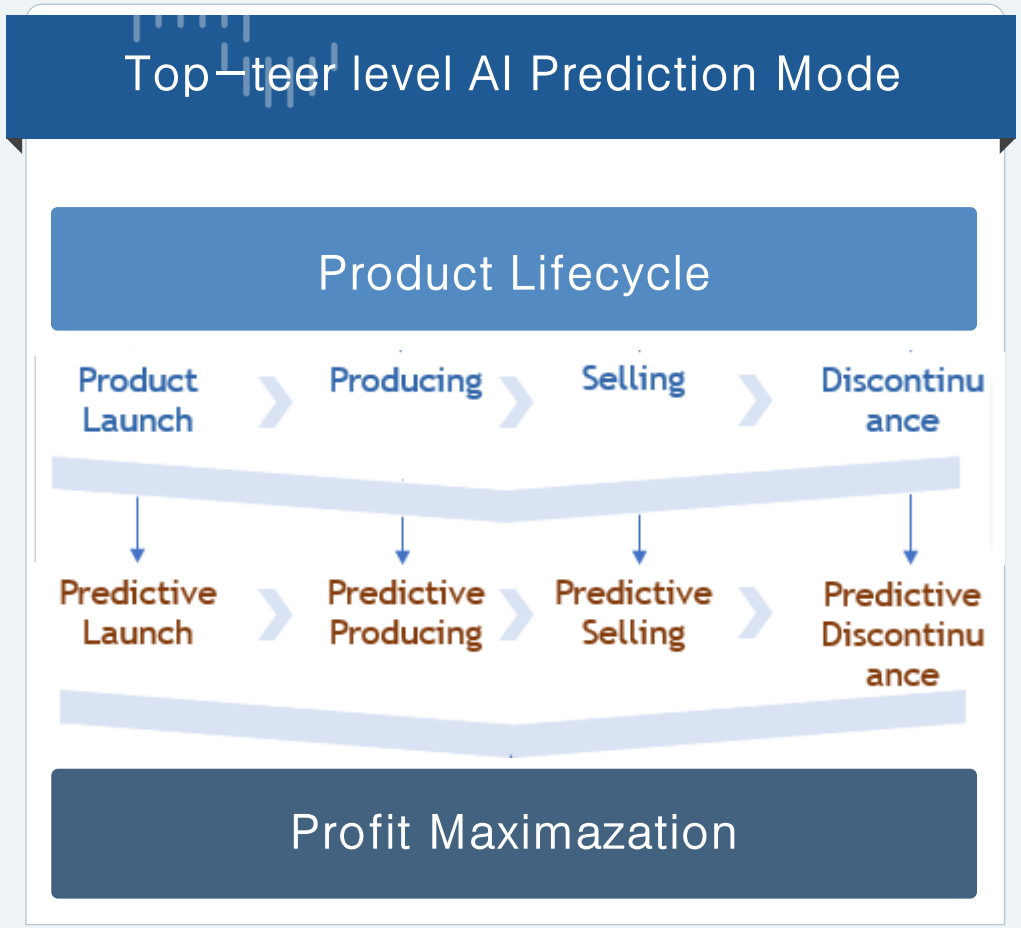
- Better predictability allows you to choose in a more favorable direction
- More accurate predictions of sales/shipments improve loss responsiveness
- Know the products that will sell well in advance and sell mainly on hit menus (switch to game that already wins and starts)

Transition to a **pre-hoc** response method

FAST and EFFICIENT

Impactive AI

Impactive AI implements transformation to A 'predictive way' as a service with AI expertise



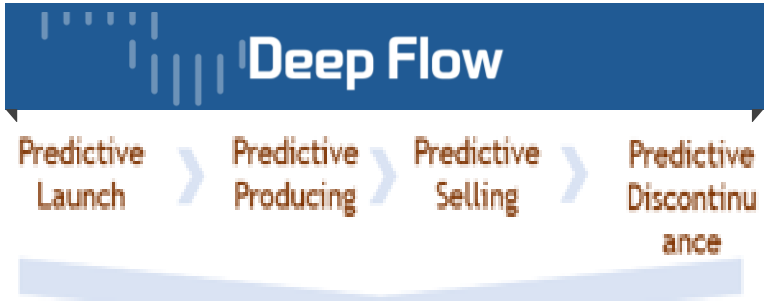
- Product life cycle from launch to discontinuation
- Applying AI predictive models to the entire lifecycle from product launch to discontinuation
- Maximizing corporate profitability by transition to 'pre-hoc response'

"Providing SaaS for prediction solutions"

Impactive AI

Core functions of Deep Flow

"Conversion to a predictive response system from before to after the launch of the product"



Module	Function
Predictive New Product Design Predictive launch	• Sales forecasting for the first quarter of the new product idea • Deduction in advance of the high-pitched and new product profile • Prediction of the possibility of failure of new product ideas • Prediction of total revenue in the lifespan and life cycle to discontinuation
Predictive Inventory Loss Prevention Predictive production /stock management	• Prediction of stock (monthly/quarter/year) • Prediction of stock shortage/overstock • Prediction of optimal production • Optimization of production schedule
Predictive Sales Planning Predictive sales	• Prediction of future sales (monthly/quarter/year) • Prediction of future revenue (monthly/quarter/year) • Prediction of optimal price of the product • Optimization of product portfolio
Predictive Model Service Predictive model management	• Management of AI model monitoring and update • Implementation of Transparent AI

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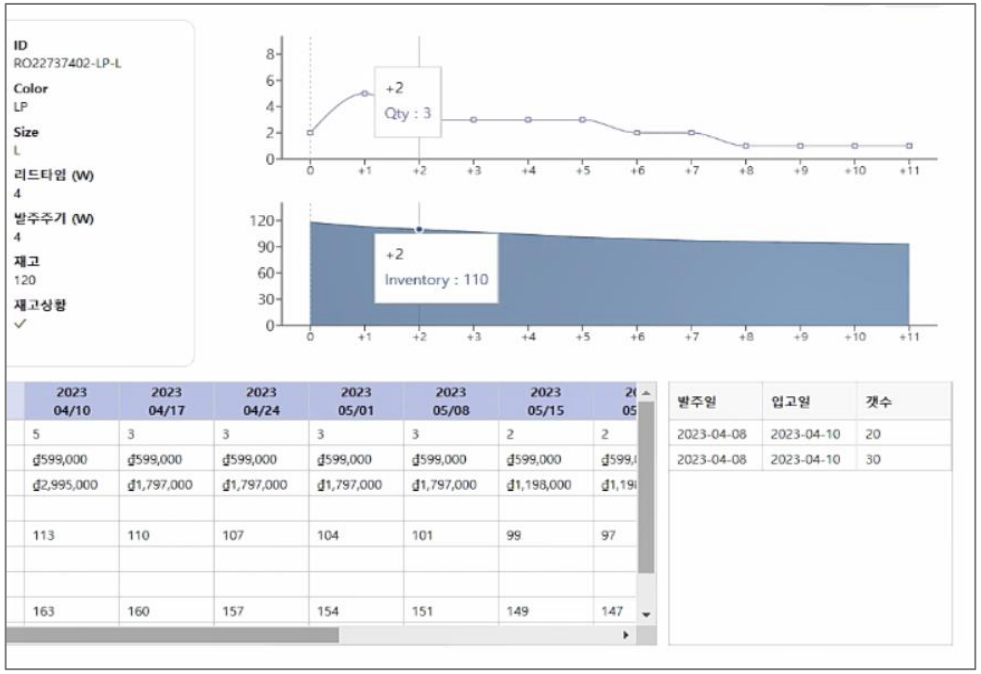
Use Case Example

Inventory Optimization based on AI demand forecasting

- Predict future inventory status through demand forecasting for each item
- Automatic calculation of product order quantity/ schedule to prevent inventory shortage and overstock
- Reducing demand-supply mismatch by optimizing inventory management to maintain safety stock levels



<그림> 딥플로우 예측적 재고관리 UI

Core index provided by the system

- TOP 10 past/future inventory turnover rates by item
- TOP 10 items expected to be overstocked next fiscal year
- Inventory frequency statistics and forecasts
- Ranking of the highest expected inventory loss next month

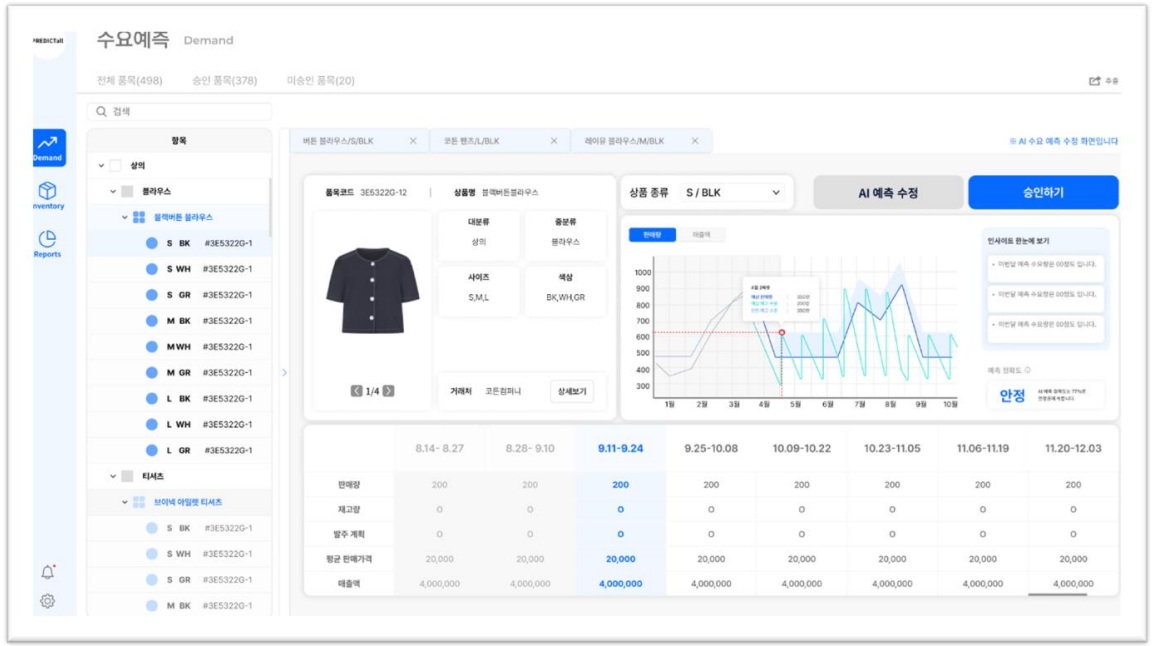
Impactive AI

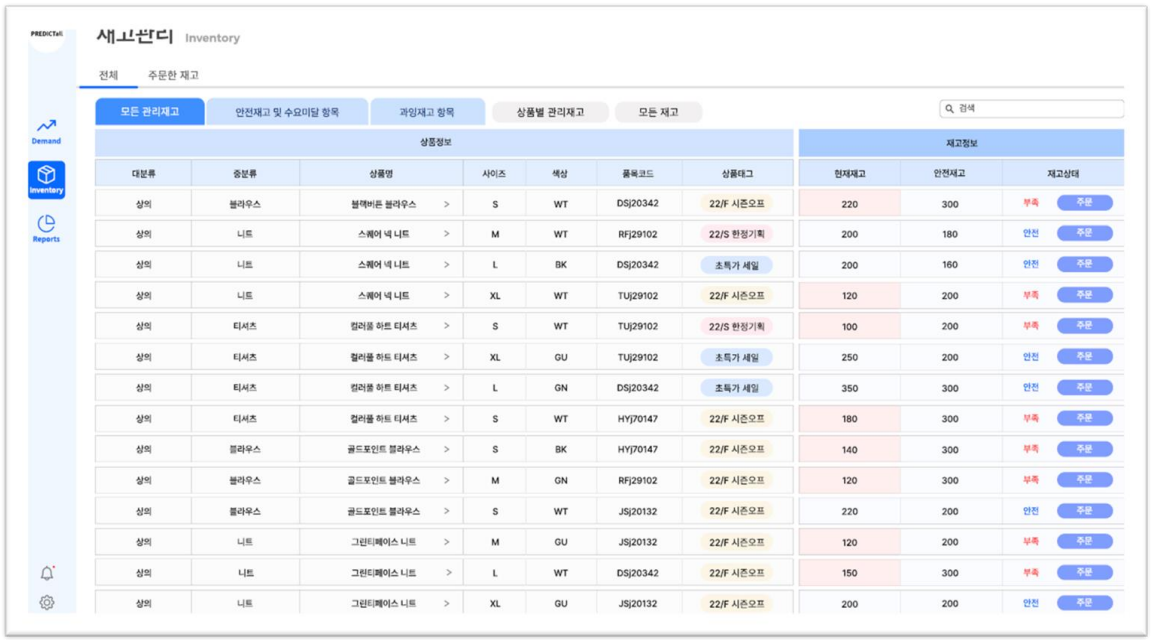
Use Case Example

Prediction of demand forecasting and inventory optimization

- Predict future order volume for each item with over 100 machine learning models (ex. Order volume after 1 week to 6 months)
- Strategically select key sales items by predicting customer order demand by season
- Supports construction of a sales portfolio focusing on highly profitable items by predicting which items will sell well

<Deep Flow predictive sales management support function UI>





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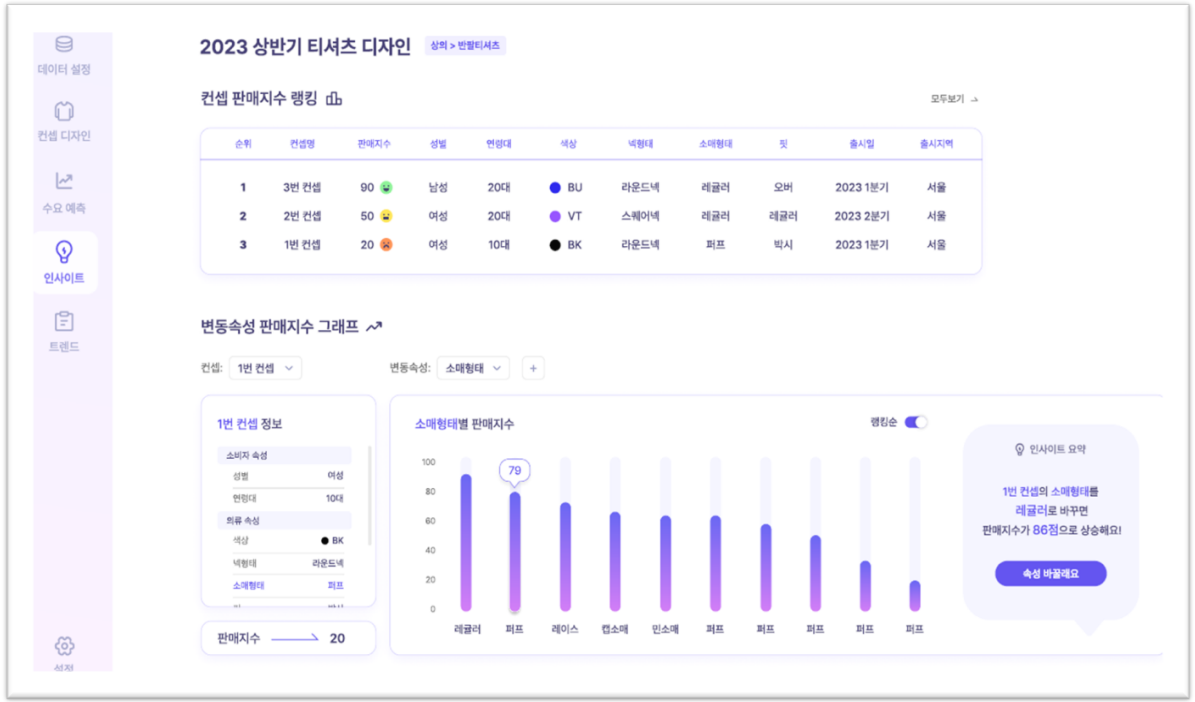
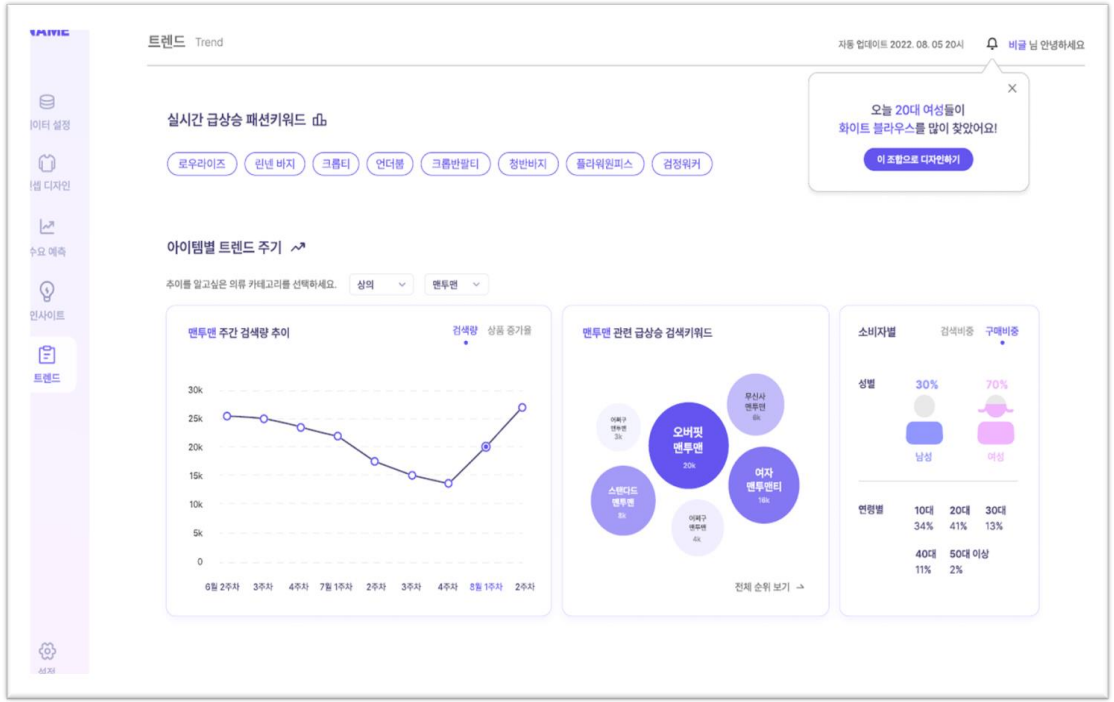
Use Case Example

Predicting the Future Performance of New Product Ideas

- Predicting success performance before New Product launch (to strategically launch best-profitable products)
- Nonlinear relationship of properties/functions of new products with sales performance is modelled via machine learning to predict sales performance with specific product properties and deduce a new product profile that is expected to create the most demand(sales).

<Deep Flow Predictive New Product Design UI>





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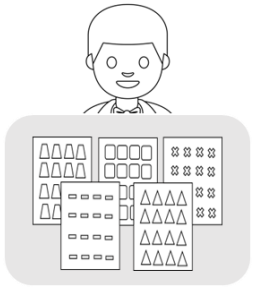
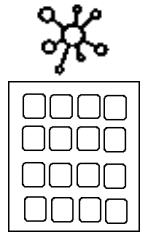
Operation process of Deep Flow

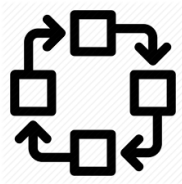
DATA IMPORTING



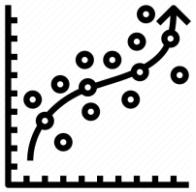
DEEP FLOW AUTOMATION



Data agent

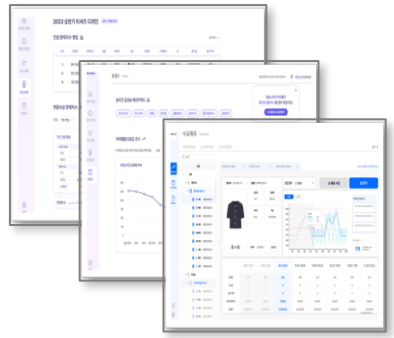


Modeling



Prediction

USER INSIGHT



Using customers' data, Deep Flow build customized Prediction models

- Data importing of client company's product transaction history
- Including key variables such as date, product ID, category, price, sales volume, etc.

- Execution of data standardization tasks for AI model learning of data agents in Deep Flow.

- Automation of modeling such as data preprocessing, feature engineering, model learning, etc.
- Deduction the optimal model as a competitive method of over 100 models

- AI prediction task
- New product idea prediction, product life prediction, product life profit prediction, inventory loss prediction, sales prediction, etc.

- Periodic use by users to obtain insights that enable them to perform predictive management
- Predictive product planning UI
- Predictive sales UI
- Predictive inventory/production management UI

Collaboration with firms

Develop predictive systems to enhance decision-making in the context of developing new solutions and services, such as car infotainment systems, customer service, features

Predictive New Product Design

- Advance prediction of performance of new service idea
- Develop high-performing new products/new service profiles in advance
- Prediction of failure potential of new service idea

Predictive Inventory Loss Prevention

- Develop ML-based price optimization model
- Optimize promotional discounts
- Pricing model based on user preference

Customer Recommendation

- Development of customized product/service recommendation model for each customer
- Discovery of lead customers by product and brand
- Target customer prediction model and service development

Predictive Model Service

- AI model monitoring and update management
- Implementation of Transparent AI

Impactive AI CEO

Doohee Chung(Ph.D) – Chief Executive Officer

Academic Background and Experience

Year	Institute/Organization	Degree/Position	Major/Departmen
2021-Present	Impactive AI	CEO	
2018-Present	Handong Global University	Assistant Professor	Global Entrepreneurship and ICT
2021-Present	MIT Technology Review Korea	Chief Editor	
2020-2021	LG Group AI Advisory Professor	Advisory Professor	
2006-2012	Samsung Economic Research Institute	Senior Research	
2017	Seoul National University	Ph.D.	Technology Management

Impactive AI

Impactive AI Key Personnel

Hyebong Choi(Ph.D)

Chief Data Officer

- Data Mining, Prediction Model Establishment, Bid data-based Analysis
- Former Researcher of A-Star IT Research Institute, Singapore
- Ph.D. in Computer Science of from KAIST

Chamgil Hong(Ph.D)

Chief Scientific Officer

- Machine Learning / Deep Learning Modelling, Intelligent System Development
- Former Engineer of Bosch and Siemens
- Ph.D. in Computer Science form University of Pittsburgh

Junghyun Park(Ph.D)

Chief Operating Officer

- Organazation and Personnel Management
- Former manager of Milliken & Company Korea
- Ph.D. in Business Administration from Sungkyumkwan University

Heewon Jeong

Chief Technology Officer

- Cloud Service Development
- Former Backend and Frontend Developer of SK Planet and Onestore
- Former System Developer of POSCO

Jinseob Yun

Machine Learning Engineer

- <Venture Entrepreneurship Research> Machine Learning Prediction Model Research Best Paper Award
- Master of AI Convergence & Entrepreneurship from Handong University

Impactive AI Key Personnel

Seoyeong Kang(Ph.D)

Director

- Machine Learning Optimization/ Social Innovation
- Head of Data Science Group at Samsung Electronics
- Chief Data Scientist of Merrill Lynch
- Ph.D. in AI & Economics from Harvard University

Cheolhyun Jeong(Ph.D)

Director

- Developing Predictive Model for Manufacturing Companies
- Machine Learning/ Deep Learning Modelling
- Ph.D. in Industry Management Engineering
- Machine Learning Strategy and PM

최은창

Legal Consultant

- Contracts and Legal Risk Advisor
- Former Fellow of Yale Law School Information Society Project
- Ph.D. in Law from Seoul National University
- Master of Laws at Yale University

Jinwoo Lim(Ph.D)

Consultant

- Commercialization and Investment
- Former Consultant of Boston Consulting Group
- Former Senior Researcher at Samsung Economic research Institute
- Ph.D. in Business Administration from Stanford University

Jukka Rauhala (Ph.D)

SW Engineering Advisory

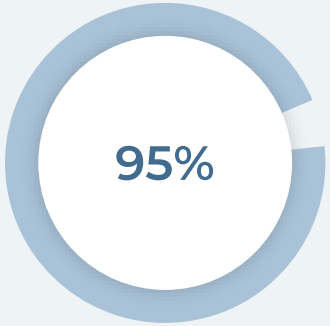
- Former Engineer of Nokia Signal Processing
- Former Software Engineer of Voimaradio
- Ph.D. in Engineering from Aalto University, Finland

The competitiveness

<Depth> AI technology advantage

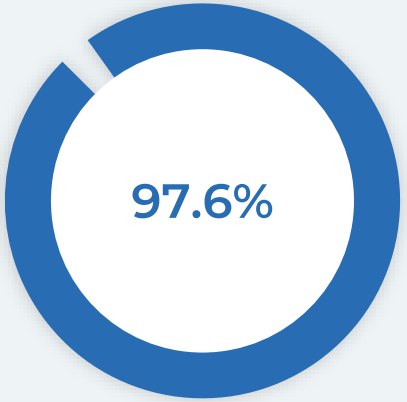
Performance of predictive models

(ex. Accuracy of prediction of human resource exodus)



IBM

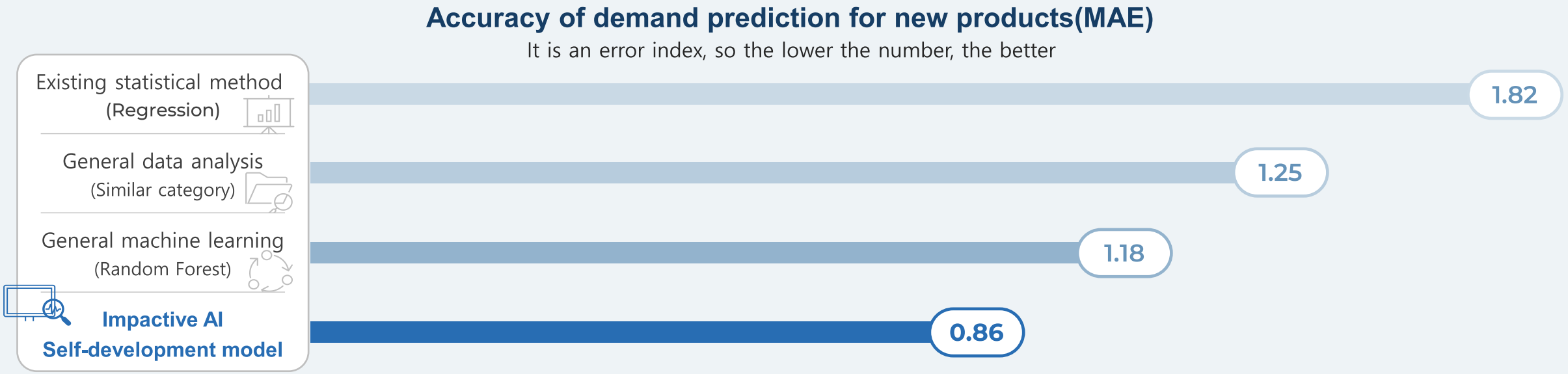
Kaggle Highest lank



Impactive AI

The competitiveness

<Depth> AI technology advantage

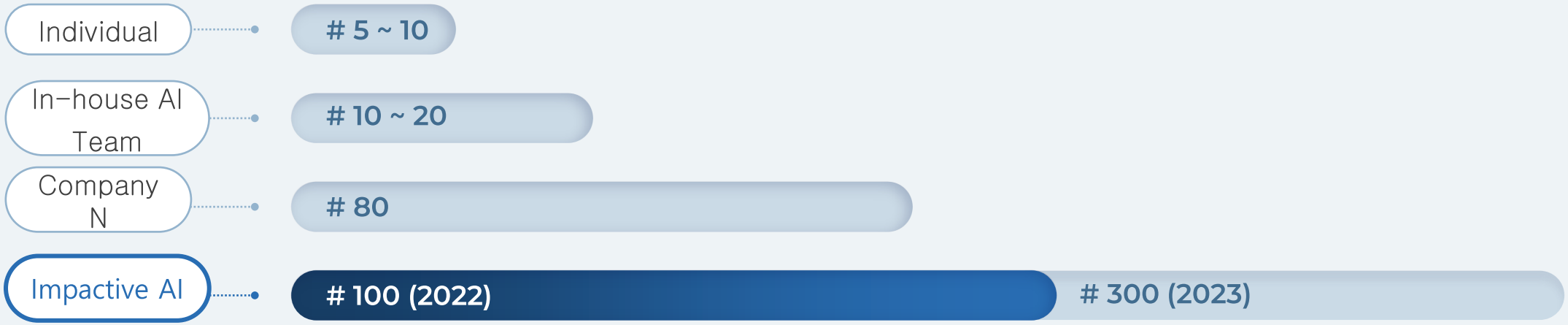


Impactive AI

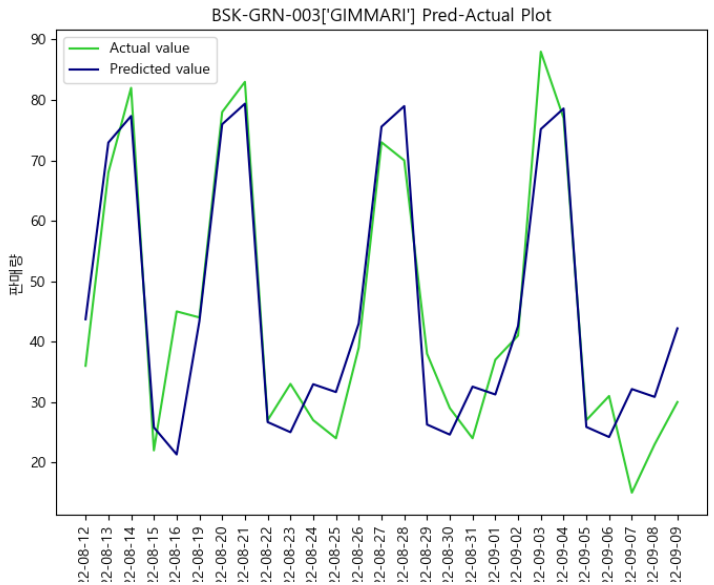
The competitiveness

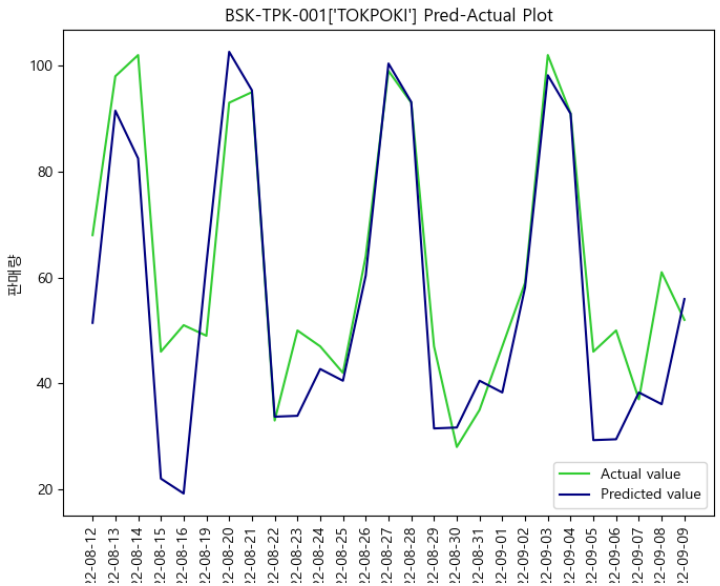
<Depth> AI technology advantage

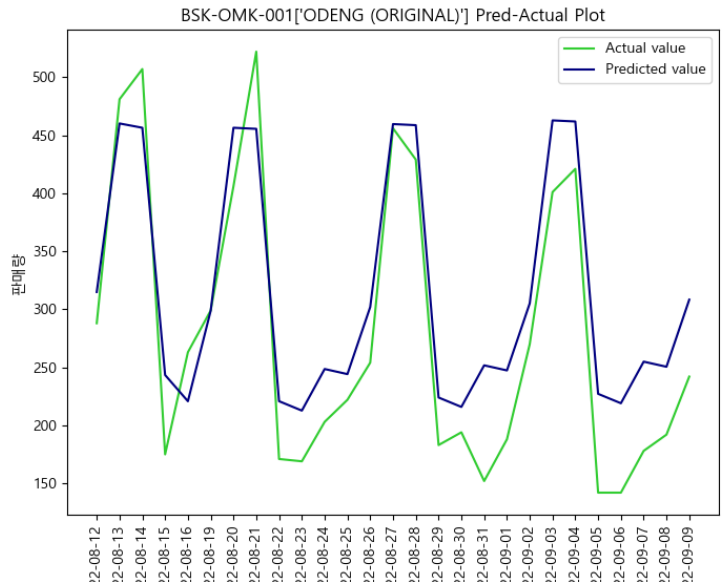
The number of AI prediction models that operate

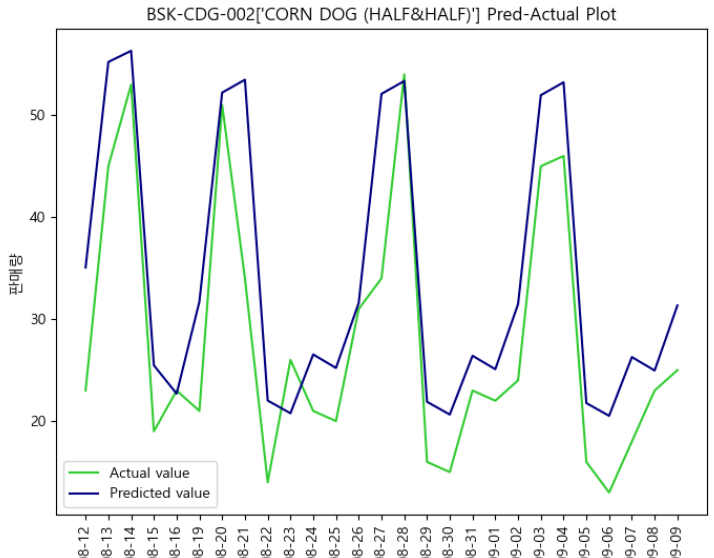


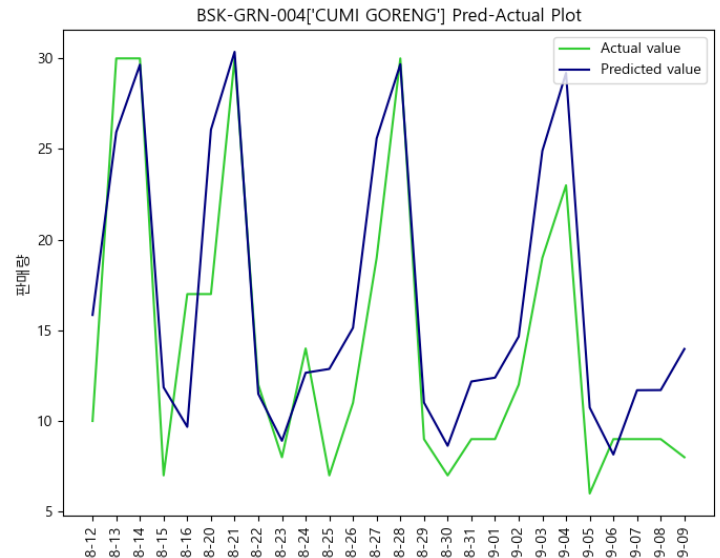
Innovine Studio – Retail industry, Daily Prediction, MAPE 0.94, R2 0.94

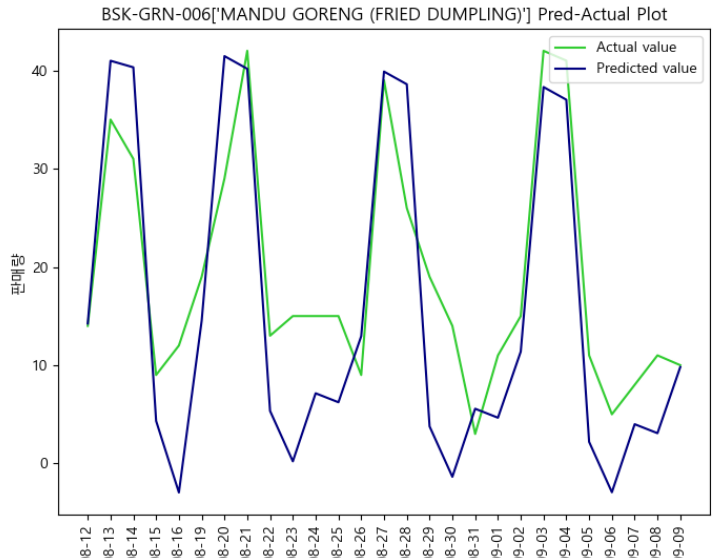












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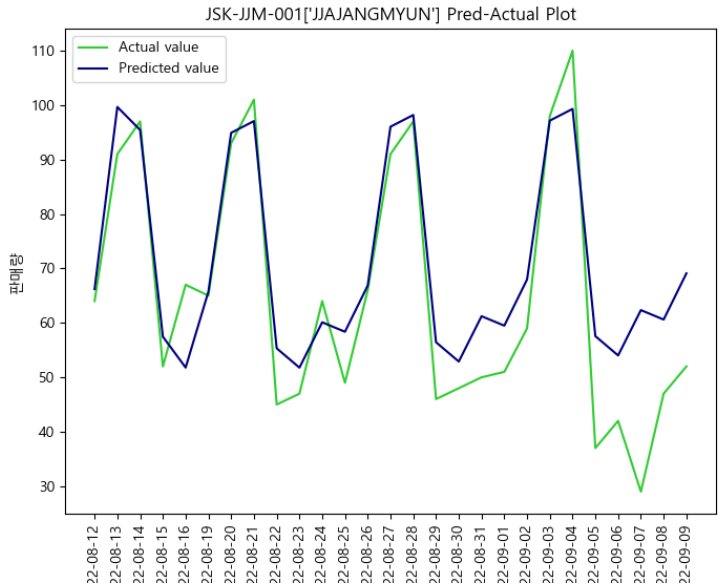

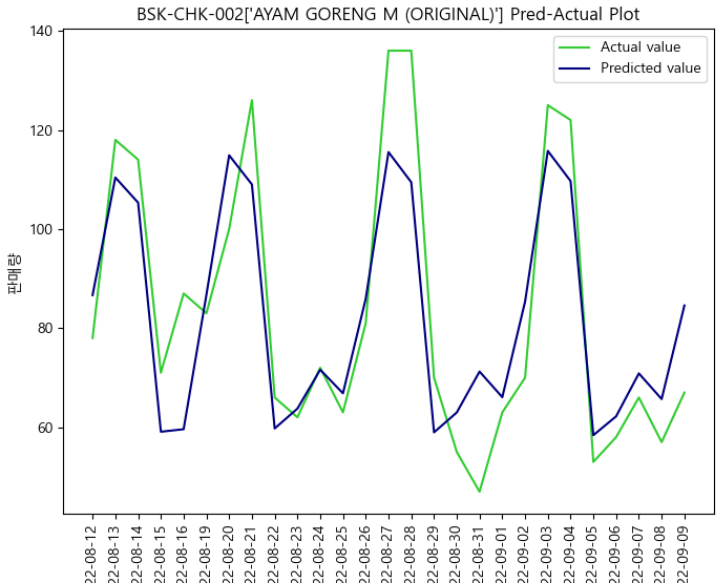

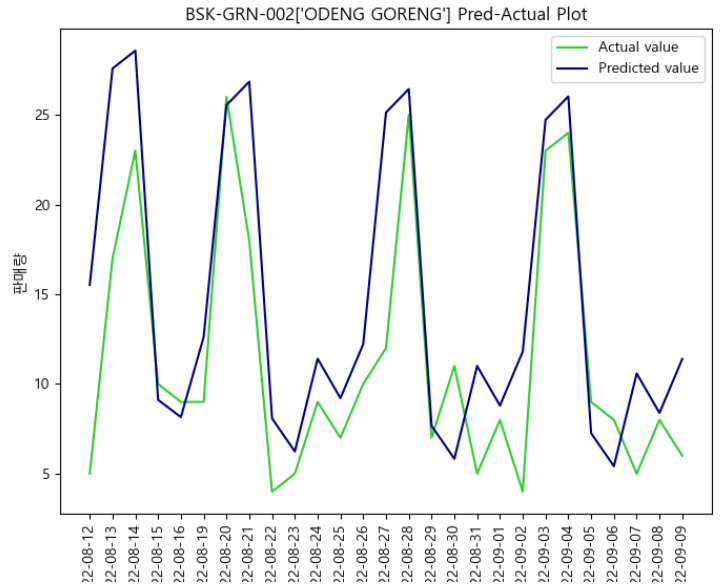

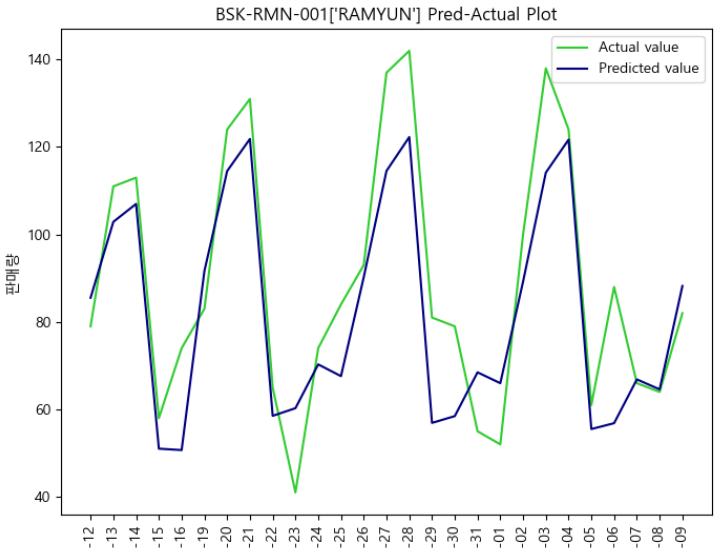

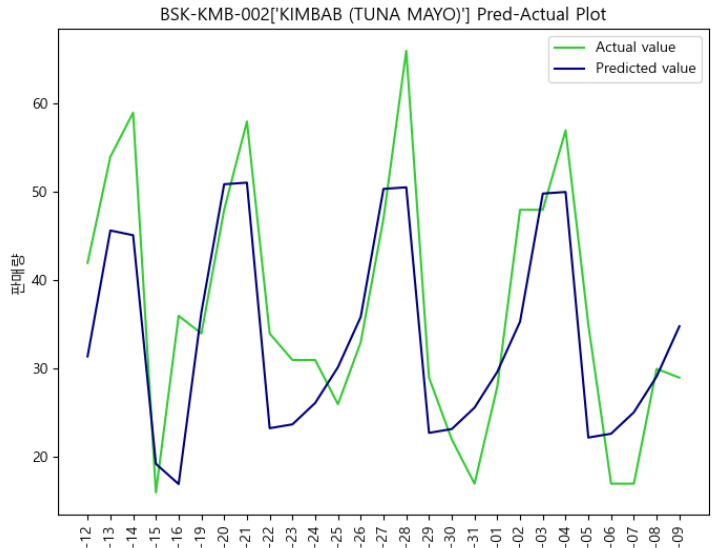

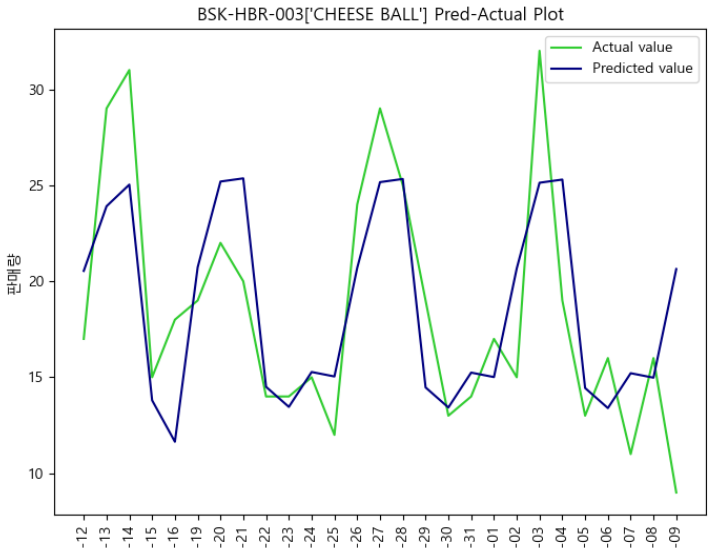

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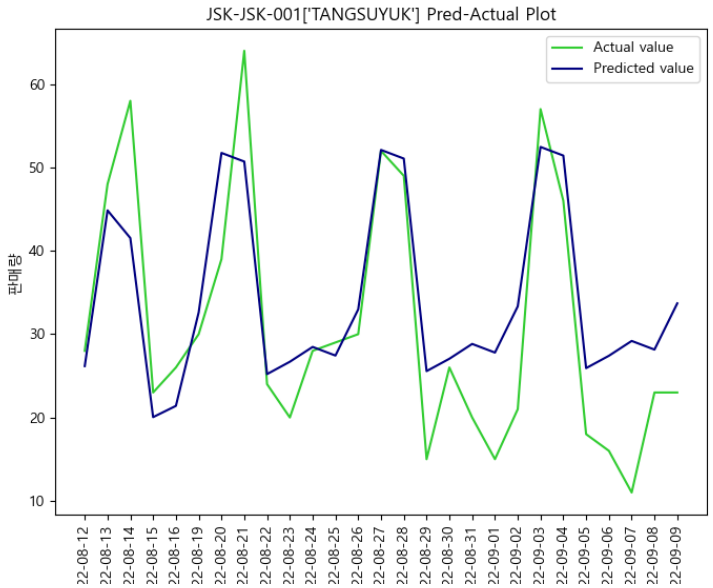
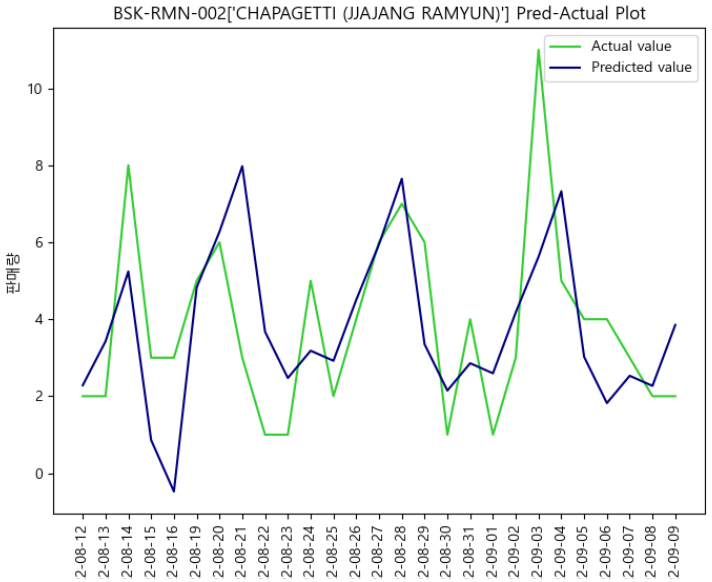
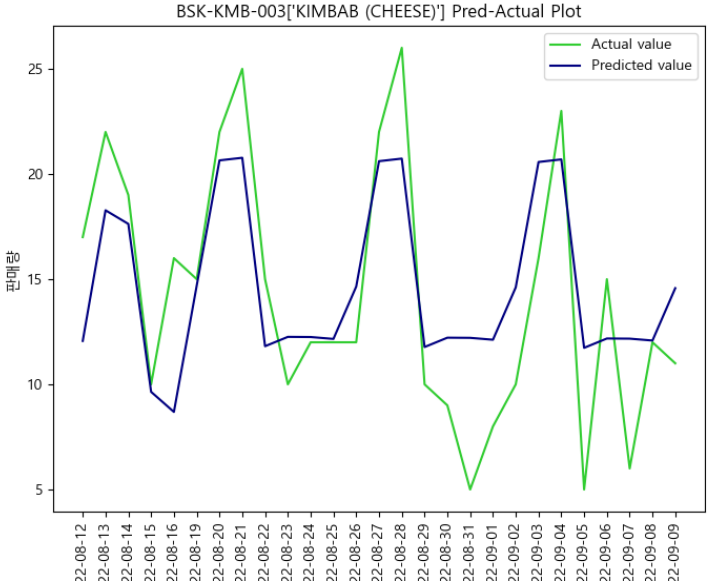
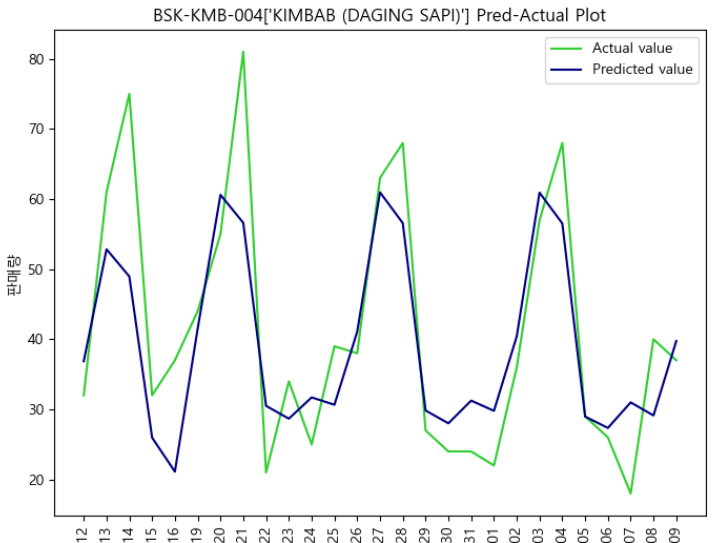
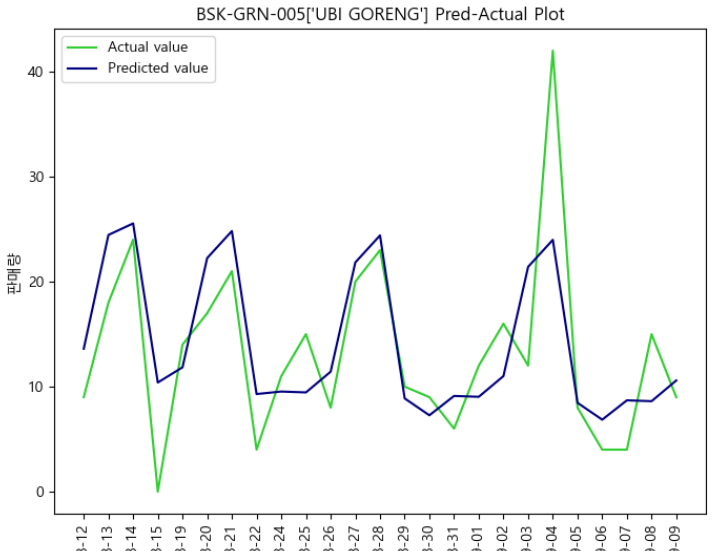
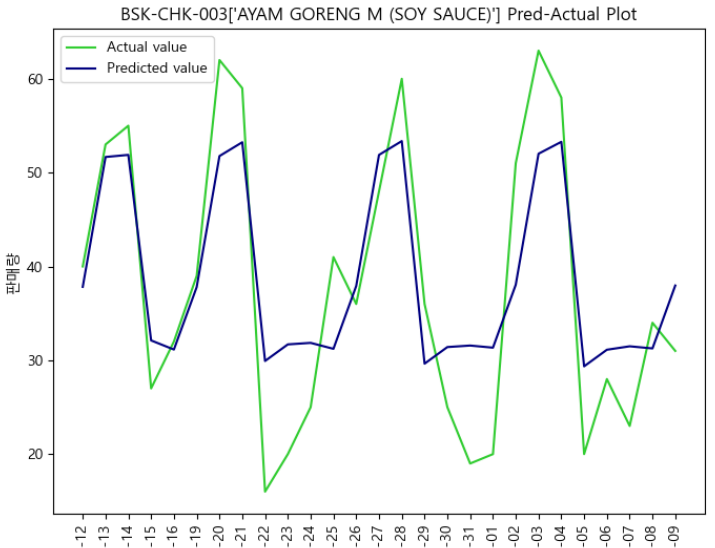










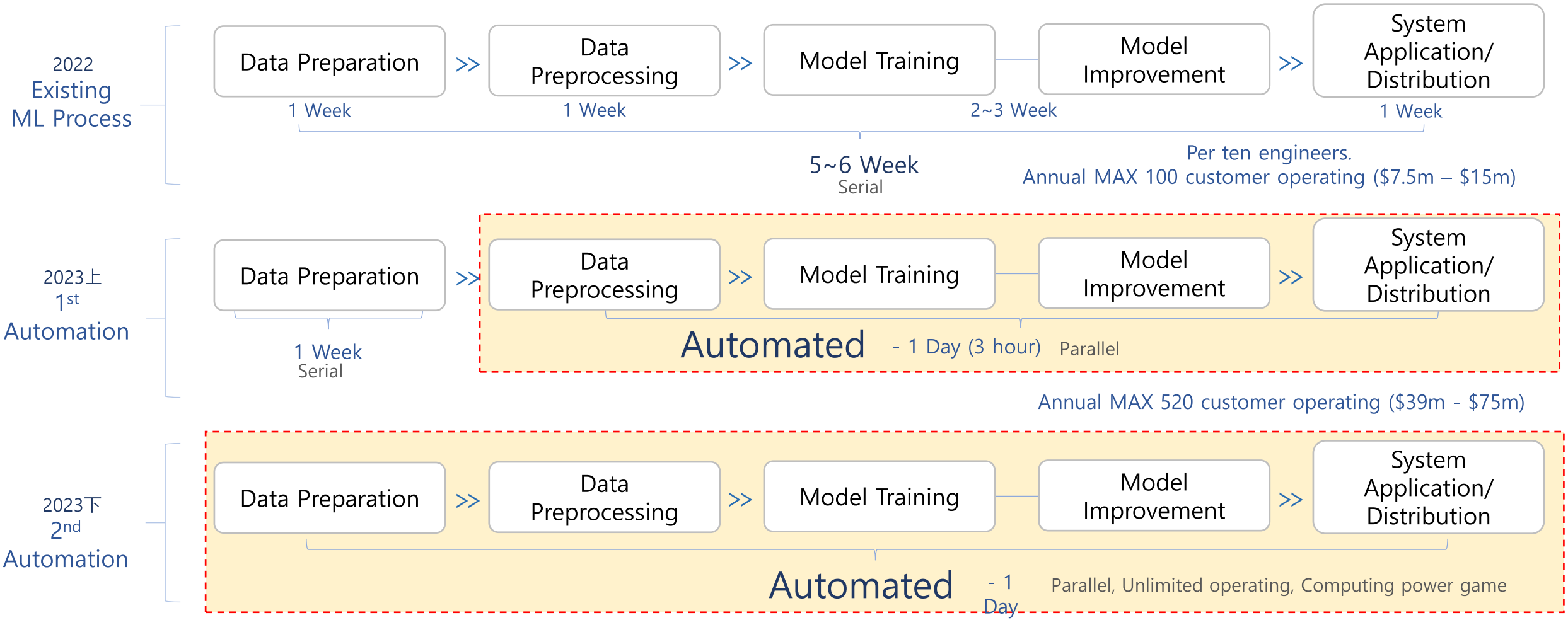


Impactive AI

Competitiveness

Automating the data pipeline operation

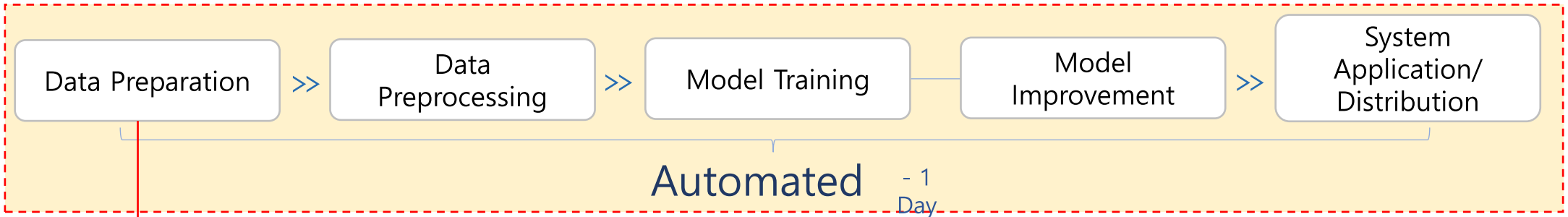
Procedures for driving AI prediction services,
many of which are labor-intensive, repetitive, and capable of automation innovation

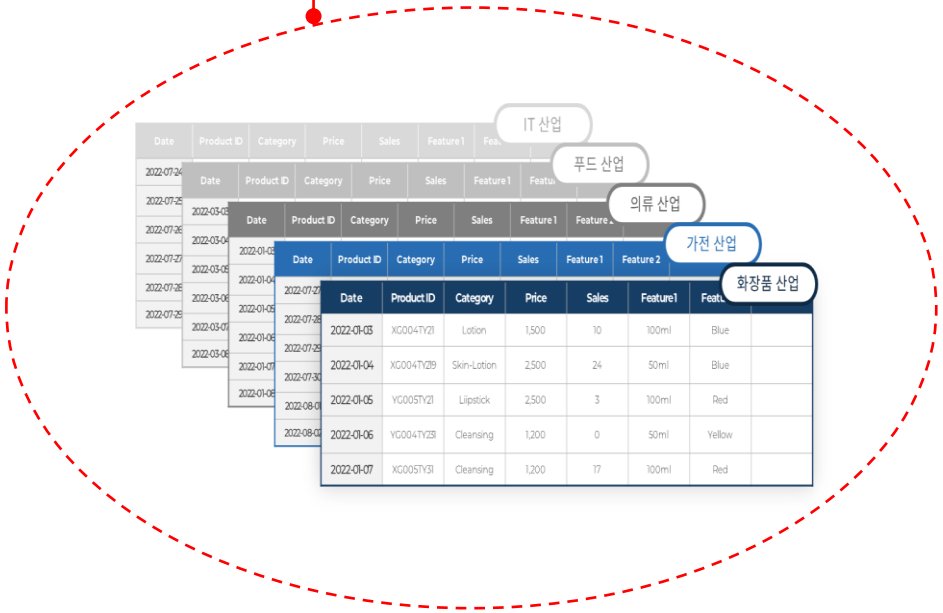


Impactive AI

Competitiveness

Feature Engineering to Cover Diverse Industry Data | Inside-out, Outside-in Strategy





Inside-out Strategy

- Although each industry and company are different in data, the types are similar
- Those companies that sell products have common feature type. {data, Product ID, Category, Price, Volume, etc.}
- It is required to match feature set types for the AI learning environment, which are almost the same regardless of industry.
- In addition to those core features, DeepFlow automatically creates environmental features, derivative features, etc., and extends them to 20 to 60 features.

Outside-In Strategy

- Identifying domain features is also important for better predicting specific industries.
- Efficient feature engineering by discovering domain features for each industry and applying them to all companies in the industry.
- Pre-trained model of industry units will be a significant material for business forecasting in the industry.

Current status of intellectual property rights

NO.	Applicant	Applied Country	Progress	Application and registration number	Name of intellectual property rights	Remark
1	Impactive AI	South Korea	Applied	10-2022-0078127	Methods and devices for generating predictive models	Patent
2	Impactive AI	South Korea	Applied	10-2022-0078128	Methods and devices for the development of predictive new products	Patent
3	Impactive AI	South Korea	Applied	10-2022-0099342	AI stacking ensemble prediction model	Patent
4	Impactive AI	South Korea	Applied	10-2022-0113420	Methods, programs, and devices for the development of new products based on AI	Patent
5	Impactive AI	South Korea	Applied	10-2022-0116942	Methods and systems for predicting entrepreneurial innovation using machine learning	Patent
6	Impactive AI	South Korea	Applied	10-2022-0135963	Methods predicting sales of new products using hybrid models based on ML	Patent
7	Impactive AI	South Korea	Applied	10-2022-0135964	Devices for building hybrid ML model to advance demand predictions for new products	Patent
8	Impactive AI	South Korea	Applied	10-2022-0143565	Machine learning prediction model for the intention to accept Robo Advisor	Patent
9	Impactive AI	South Korea	Applied	10-2022-0164818	Machine learning based demand prediction model and program	Patent
10	Impactive AI	South Korea	Applied	10-2022-0165017	Artificial Intelligent based demand prediction model and program	Patent
11	Impactive AI	South Korea	Applied	10-2023-0045124	Machine learning based demand prediction model and program	Patent
12	Impactive AI	International	Applied	PCT/KR2023/004811	Methods and devices for the development of predictive new products	Patent
13	Impactive AI	South Korea	Applied	40-2022-0204135	Deep Flow trademark	Trademark
14	Impactive AI	South Korea	Applied	40-2022-0204136	Deep Flow trademark	Trademark
15	Impactive AI	South Korea	Applied	40-2022-0204137	Deep Flow trademark	Trademark

3. REFERENCES

Impactive AI

Applied cases

LG전자

Deduction of the direction of LG Pra.L medical device and product transformation using deep flow technology

(Exclusive presentation to former Chairman)

JW 중외제약

Use of Impactive AI prediction technology, prediction of drug defect rate and yield, and development of defect cause detection model

HYUNDAI

AI based digital transformation strategy establishment consulting for strengthening future competitiveness

Strategy to strengthen Hyundai Motor Company's competitiveness using AI prediction

LIMEORANGE

Supply of Deep Flow prediction system to Vietnamese clothing company

(Reduction of inventory shortage by 80% by the ability to predict product sales and inventory)

INNOVINE STUDIO

Supply of deep flow prediction system in Indonesian food court business

(Operation of pre-preparation system by predicting daily orders by menu of food court)

서울향료

No.1 domestic fragrance company, supply of 1,500 fragrance requirements and inventory prediction system

(Process of the order calculation work that takes 15 days every month in 7 minutes, improvement of 90% of accuracy over user work)

Impactive AI

Applied cases

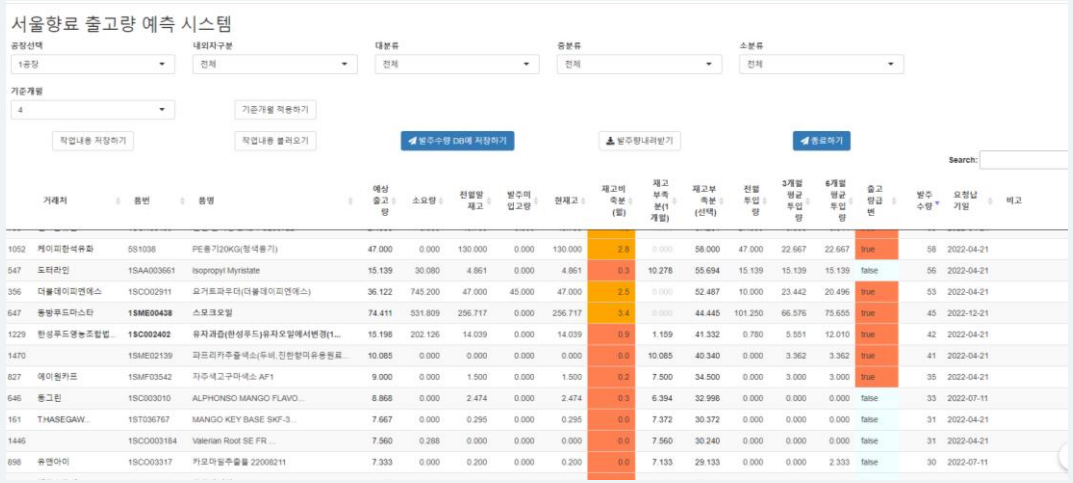
Seoul Flavor

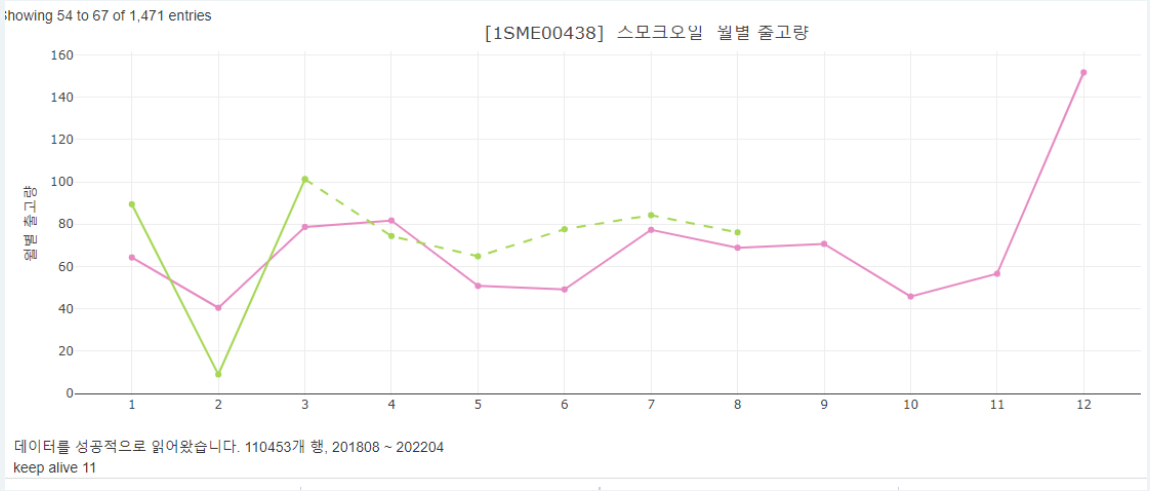
· **Motivation: Procurement of 1500 flavors per month, which was inaccurate and took 15 days per month(180 days per year)**

· Effect1: Work efficiency improved dramatically by automatically generating a draft order in 7 minutes instead of 15 days per month.

· Effect2: The prediction model is better than the user in all indicators in monthly comparison (error rate improved by 70~80%)

· Effect3: The model's prediction accuracy increases upward every month, creating a virtuous cycle of performance improvement over time.





Impactive AI

Feedback

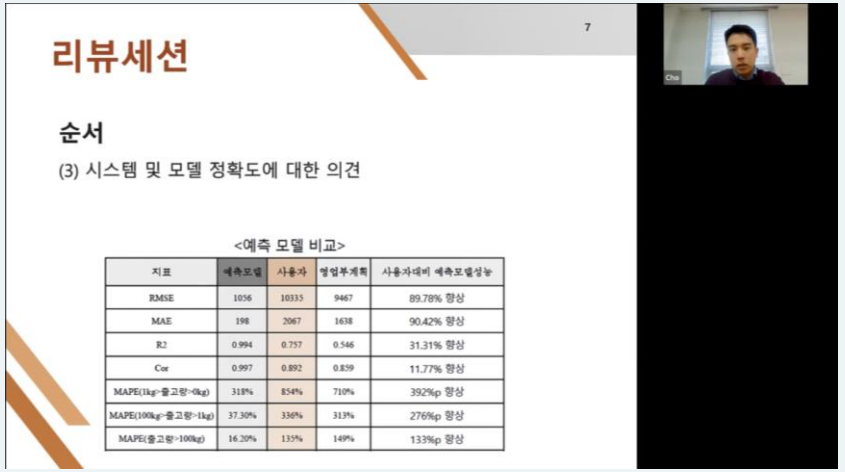
Seoul Flavor

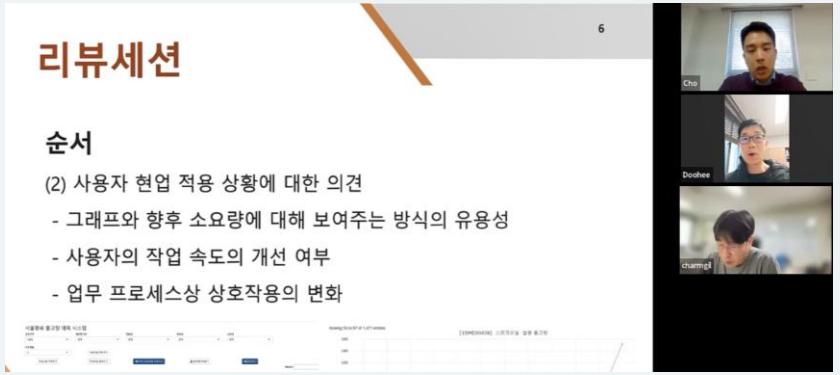
"It's a satisfactory result that the AI demand model system has reduced the department head's work time meaningfully"

"Also I am looking forward to the increasing accuracy of the AI model's predictions."

"It is good that users can easily access and use the system, and that it is linked with ERP to intuitively check the demand situation."

"It is good that users can easily access and use the system, and that it is linked with ERP to intuitively check the demand situation."





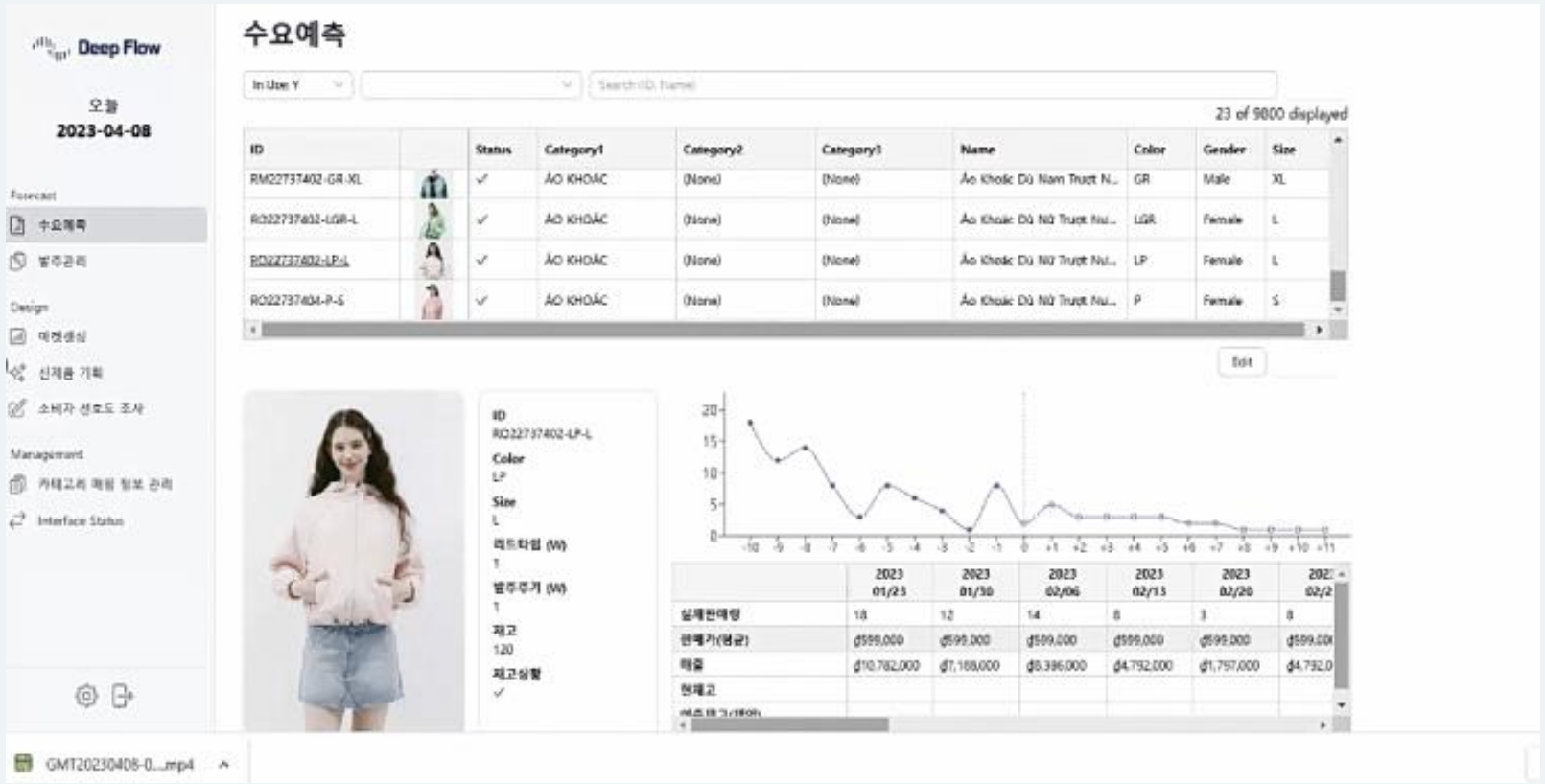
Impactive AI

Applied cases

LimeOrange

LIMEORANGE

- **Motivation: Fashion apparel business in Vietnam, flexible product sales/management with trend changes**
- **Step 1, Build a demand forecasting inventory management system, Step 2, Build a demand forecasting system for new products in advance, of which Step 1 was built first**
- Effect 1: Significant improvement in demand forecasting accuracy
- Effect 2: Improved user-friendly UI
- Effect 3: Proactive response process by identifying sales trends by item in advance



Impactive AI

Feedback

LimeOrange

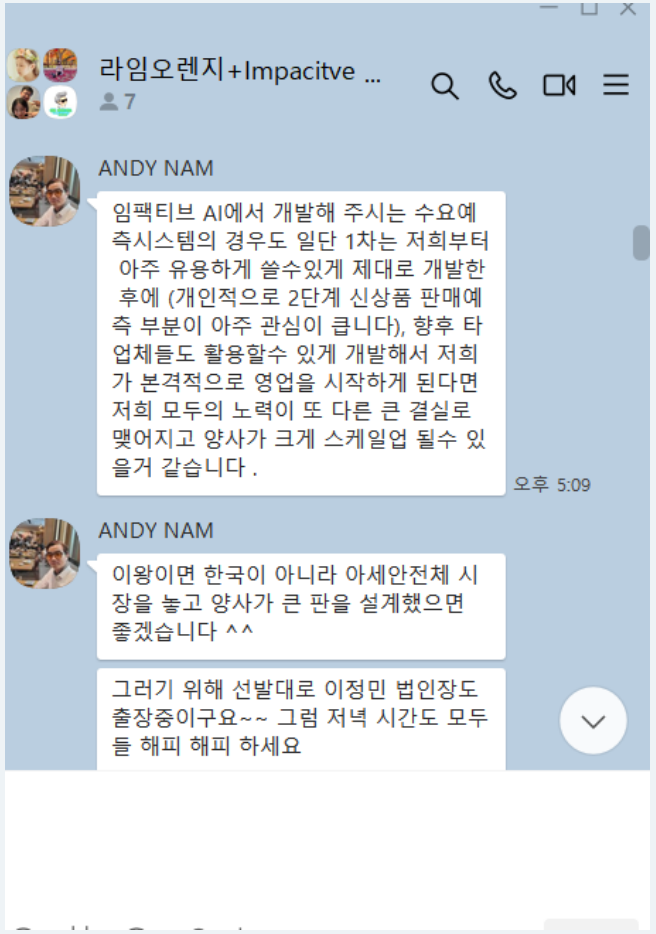
LIMEORANGE

"I think you could make an AI project that you can proudly showcase in the future."

"It must have been difficult to implement a demand forecasting model and system to be used in an unfamiliar fashion domain, but it was good to see traces of a lot of thought and effort."

"In the case of the demand forecasting system developed by Impactful AI, we have been able to use it very well for the first time, and I am personally very interested in the second stage of new product sales forecasting (follow-up solution supply)"

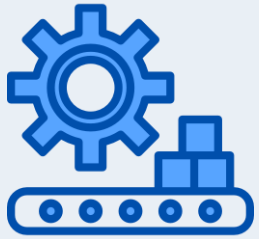
"If we develop it so that other companies can utilize it in the future and we start sales in earnest, I think our efforts will bear another great fruit and both companies will be able to scale up significantly."



Impactive AI

Initial market converage

Manufacturing



- **Companies with more than 100b won in revenue.**
- **14,552 in total**
- **1k new startups per year**

Retail

- **Companies with more than 50b won in revenue**
- **18,859 In total**
- **2k new startups per year**

■ The target is the companies with more than 100b won in sales in manufacturing and 50b won in sales in retail.

■ A total of 33,400 companies, wit 3,000 new companies starting up every year.

■ Effective sales poop (30%) of 2 trillion won, of which more than 10% is expected to be the target pool.

■ Other industries than manufacturing and retail & global industry are possible market

Source: KOSIS (2021)

Thank You