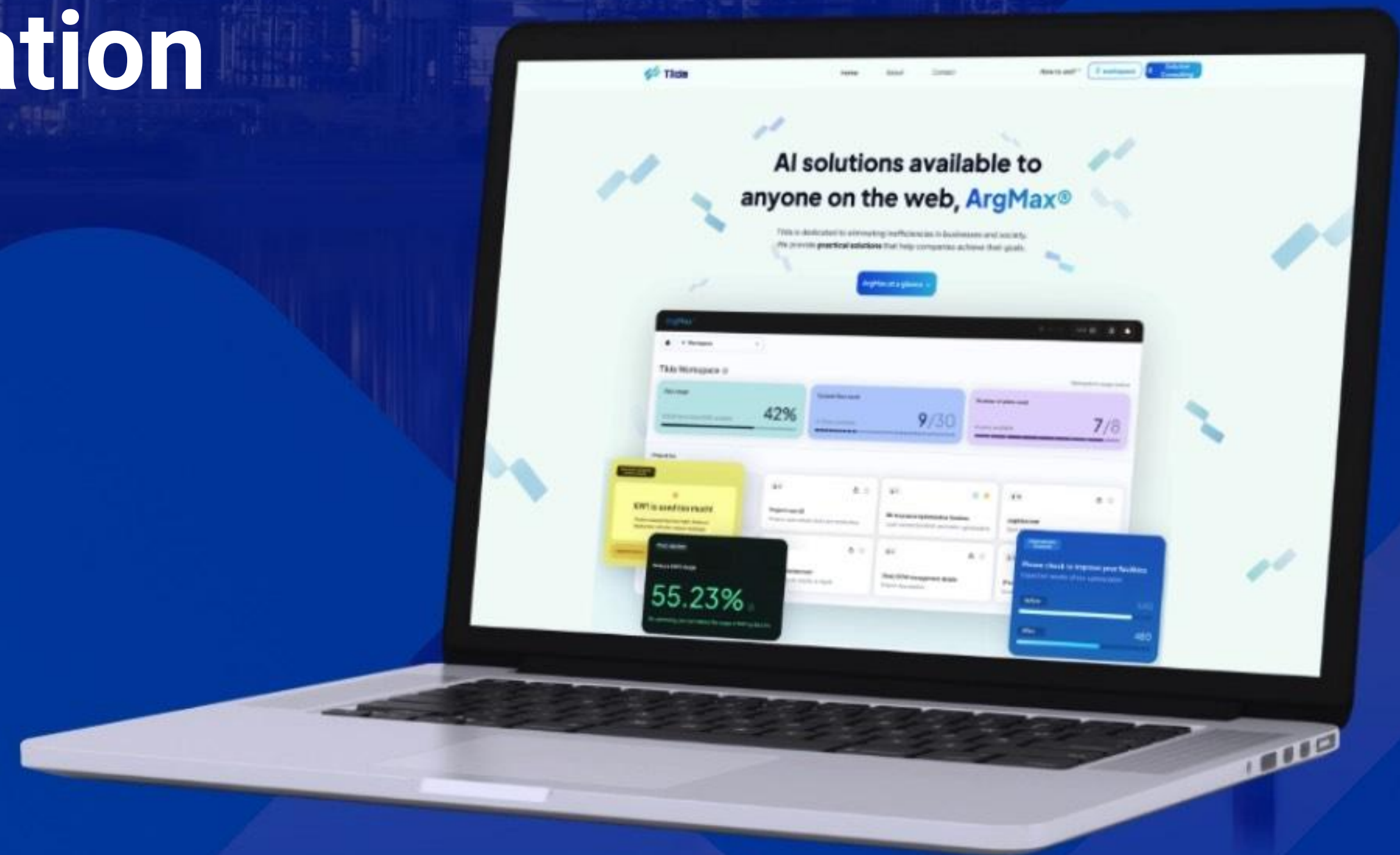


ArgMax®



Tilda

Unlock the Power of AI for Manufacturing Optimization



Problems for Manufacturing



Costly, difficult, and deficient solution
Intelligentization

Why do we need
*Intelligent
Manufacturing?*

- ✓ Better productivity
- ✓ Better quality
- ✓ Lower cost & risk
- ✓ ESG

Market needs

AlphaGo of manufacturing

prescribing “action plans” for optimal facility

control



Too Expensive

- Custom AI solutions cost \$100K-\$1M



Too Difficult

- AI knowledge or engineers required



Scarce Solution

- Very few prescriptive solution available in the market

ArgMax®



Tilda

ArgMax's AI automatically analyzes data, discovers trends, and identify areas for improvement without the need for expensive AI experts

Request domain knowledge to transform domain-specific problems into a common machine learning optimization problem

UX

1 Data Upload

Facility
Operation Data
Molding Test 06

AI modeling 0%

Data Goals Constraints Modeling

1 AI modeling step #1: Data

Uploading new data for AI modeling
Please select your data file to upload

Drop a file here to upload, or [click here to browse](#)

[Upload the selected file](#)

Upload



2 Goal Setting

Optimization Goal

2 AI modeling step #2: Optimization Goal

Select all output variables

At least one output variable must be selected

Average_Back_Pressure Average_Screw_RPM Barrel_Temperature_1 Barrel_Temperature_2 Barrel_Temperature_3 Barrel_Temperature_4 Barrel_Temperature_5 Barrel_Temperature_6 Barrel_Temperature_7 Clamp_Close_Time Clamp_Open_Position Cushion_Position Cycle_Time EQUIP_CD EQUIP_NAME Filling_Time Hopper_Temperature Injection_Time Max_Back_Pressure Max_Injection_Pressure Max_Injection_Speed Max_Screw_RPM Max_Switch_Over_Pressure Mold_Temperature_1 Mold_Temperature_10 Mold_Temperature_11 Mold_Temperature_12 Mold_Temperature_2 Mold_Temperature_3 Mold_Temperature_4 Mold_Temperature_5 Mold_Temperature_6 Mold_Temperature_7 Mold_Temperature_8 Mold_Temperature_9 PART_FACT_PLAN_DATE PART_FACT_SERIAL PART_NO PassOrFail Plasticizing_Position Plasticizing_Time Reason Switch_Over_Position Unnamed0

How to optimize selected output variable?

Select optimization goal for each output variable

STEP1 STEP2 STEP3 STEP4 STEP5 STEP6 STEP7

Next



3 Constraints Setting

Constraints for Variables

3 AI modeling step #3: Constraints

Set constraints for selected variables

Check default settings and modify if necessary

Max_Injection_Speed

Select data type: number category

Missing data handling:

Data types: numeric 100 character 0 null 0

Normal range: min max

/

Modify Constraint



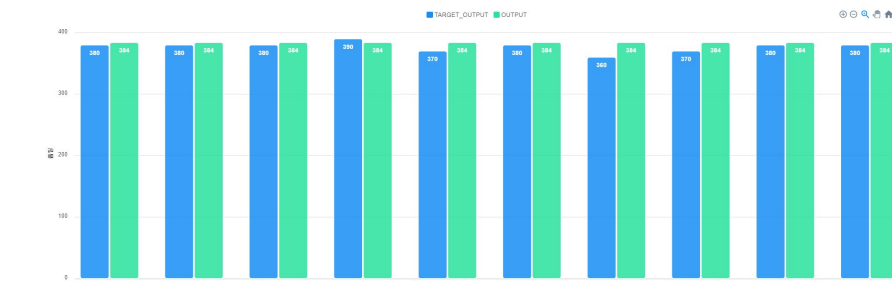
4 AI Prescription

Prescription Results

4 AI modeling step #4: Results

Check AI modeling result

Review model performance



5 AI modeling step #5: Utilization

[Request new plan](#)

[View current plan](#)

Try new context values to find out optimal control values

Input values for context variables

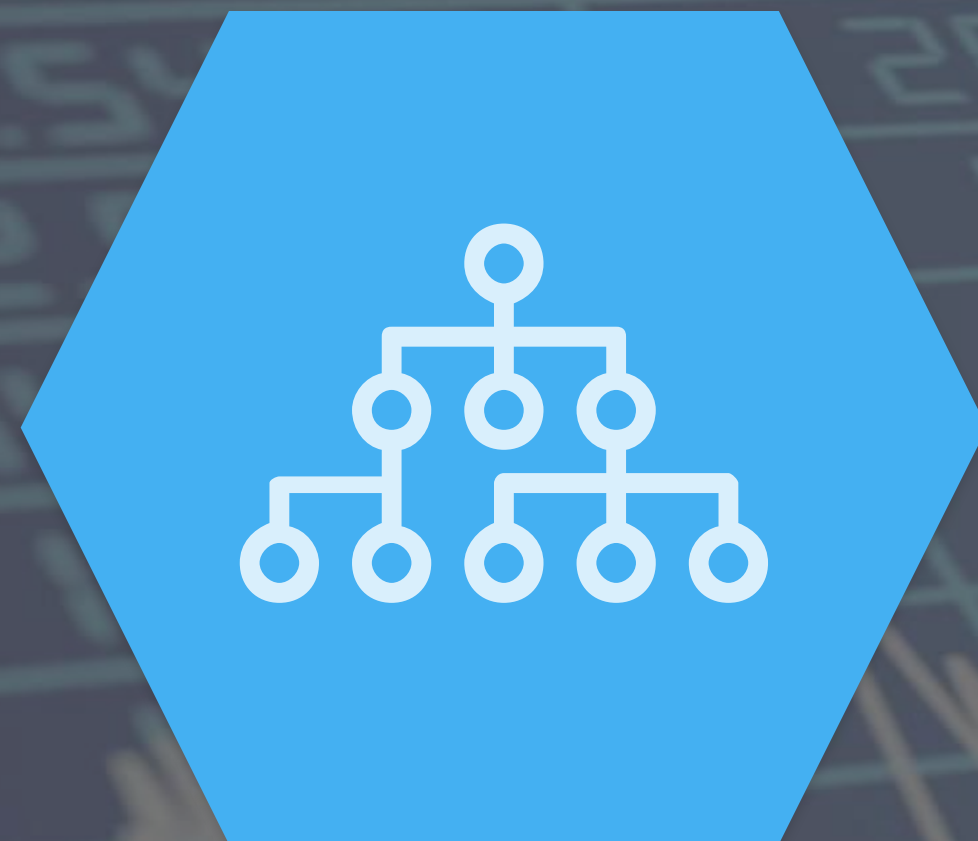
274.79998779296875 ≤ ≤ 287.1000061035156

274.20001220703125 ≤ ≤ 286.5

274.1000061035156 ≤ ≤ 285.79998779296875

Algorithm

1. Collect



- Facility's historical operation data for AI model training

2. Model



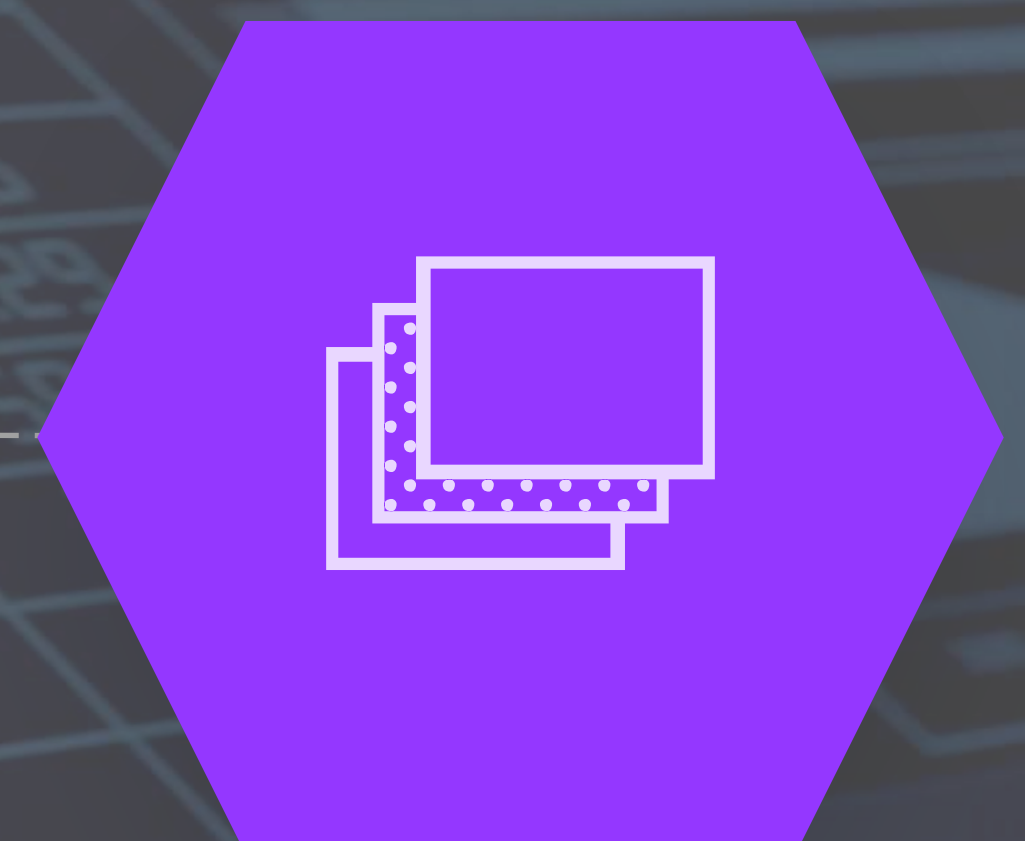
- Surrogate AI model mimicking behavior of the given facility

3. Search



- Combined with trained surrogate model, find the control values optimizing target output

4. Apply



- Apply the optimal control values to the actual facility

ArgMax® in Manufacturing & Other



Manufacturing



Logistics



Healthcare



Finance



Solar System



Budgeting



ArgMax® Success

Real-time equipment control and work standards optimizations



Pulp Refiner Energy Optimization



Hansol
한솔제지

- To reduce electricity used by multiple pulp refiners in paper manufacturing
- Actual test result applied to the factory facility

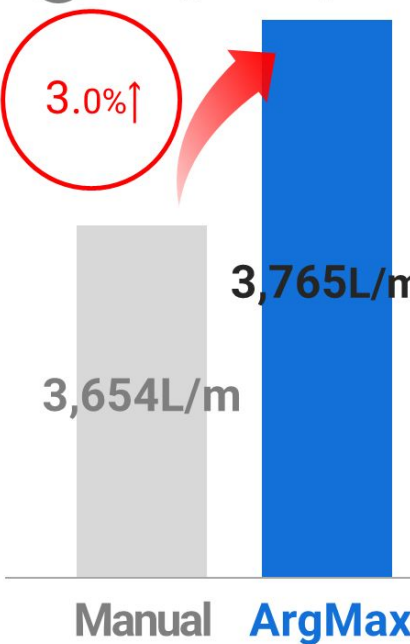
ArgMax Actual Test Results

| | |
|------------------|--------|
| Electricity used | 10.0%↓ |
| Output | 3.0%↑ |

✓ Avg. Energy

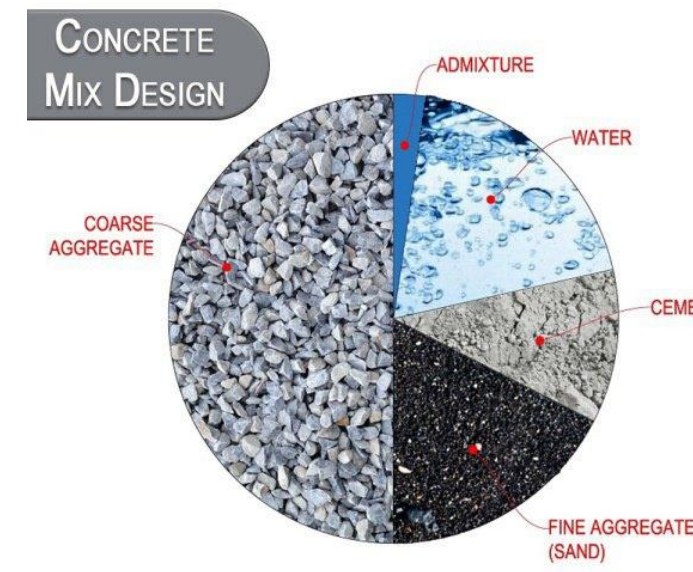


✓ Avg. Output



Concrete Strength Optimization

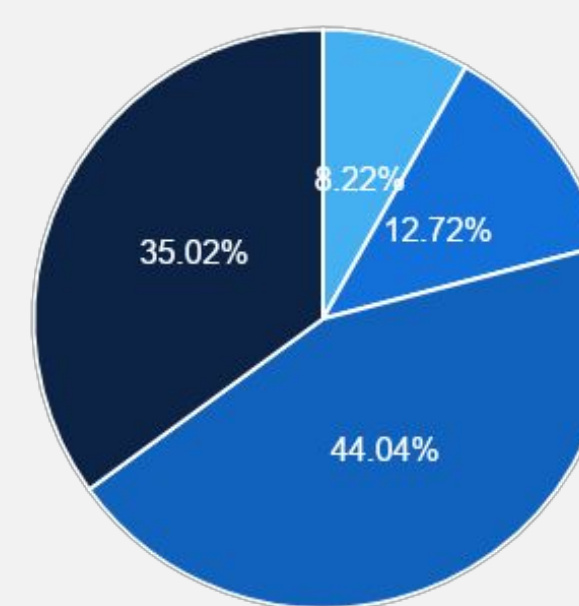
kaggle



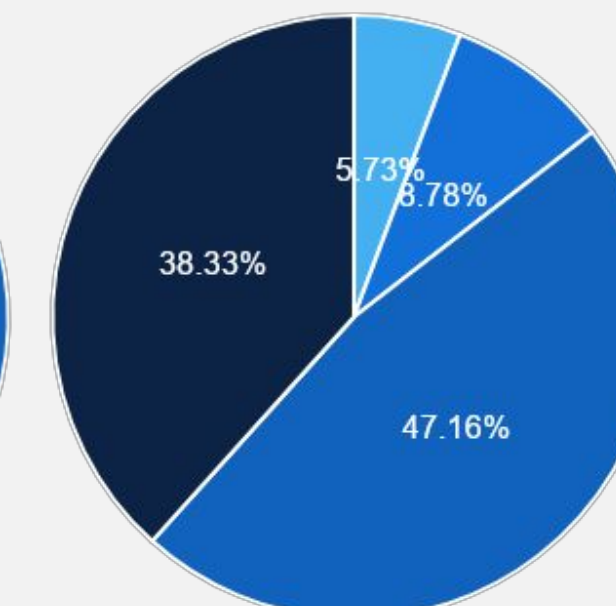
- To find concrete recipe to increase strength with the the amount of cement, water, coarse & fine aggregate as variables
- ArgMax SaaS proved to work with this Kaggle open data

ArgMax Simulation Result

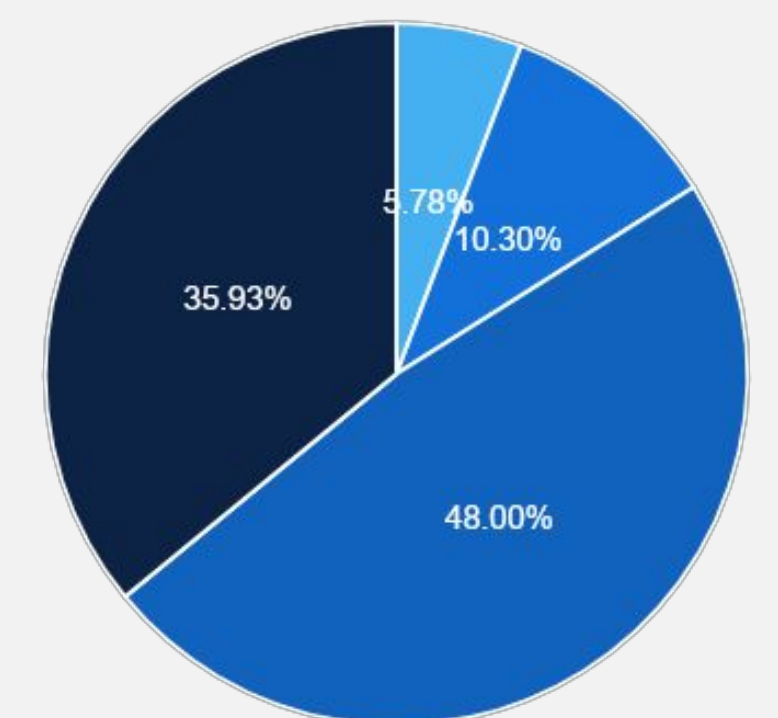
Baseline



Strength +10%



Strength +20%



■ Water ■ Cement ■ Coarse Aggregate ■ Fine Aggregate

ArgMax® Success

Real-time equipment control and work standards optimizations



Steel Rod Quality Optimization



SēAH

- Rolling mill operation (tension, speed, etc.) optimization for special steel rod products

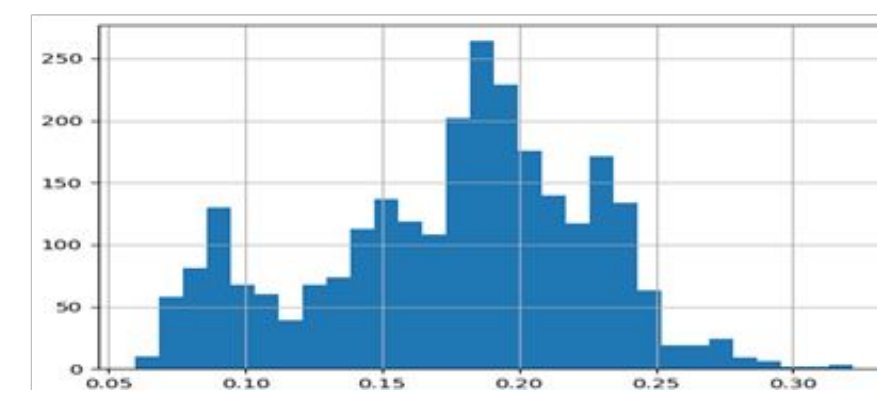
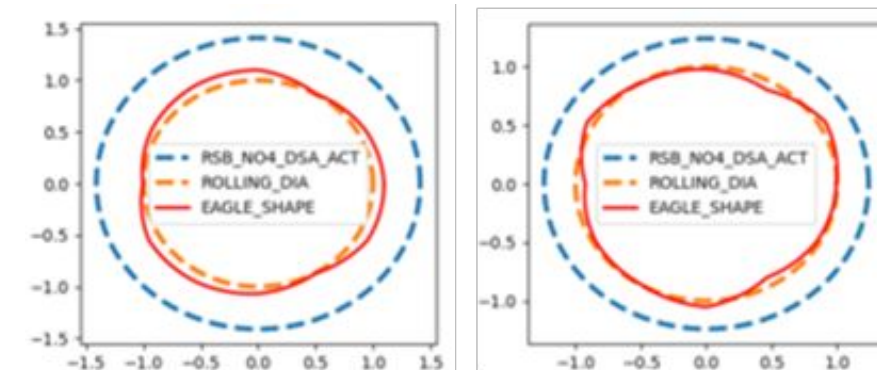


SAMA

- Work standard optimization to improve aluminum foil quality

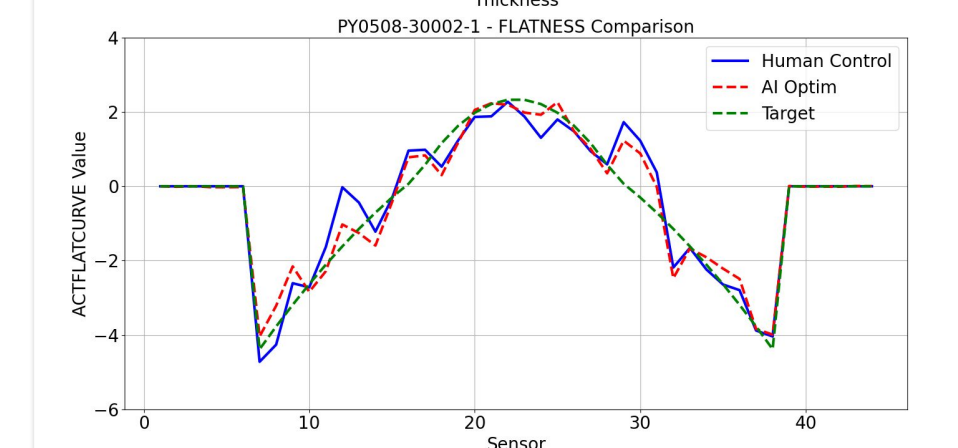
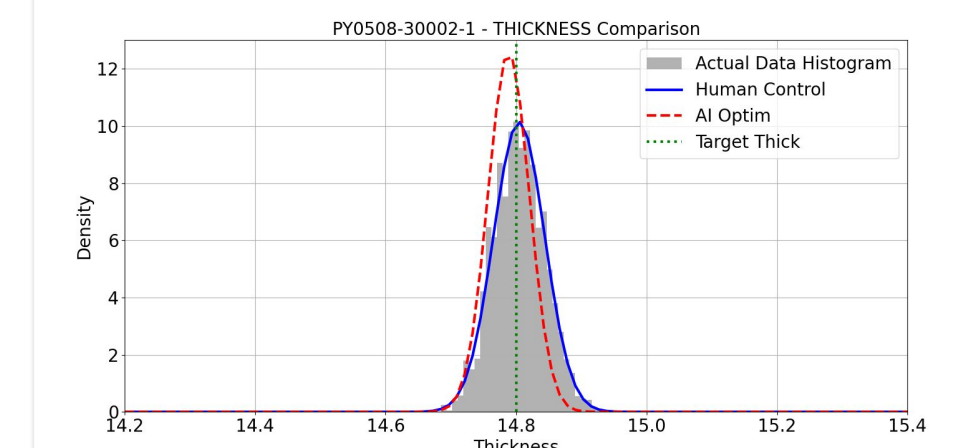
ArgMax Actual Test Result

| | |
|----------------------------------|-----------------|
| Rod ovality (roundness error) | 26.67% ↓ |
|----------------------------------|-----------------|



ArgMax Actual Test Result

| | |
|---------------------|--------------|
| Work standard range | 60% ↓ |
| Thickness error | as-is |
| Flatness error | 3% ↓ |



ArgMax® Success

Process & scheduling optimizations
Cases



Slitter Throughput Optimization

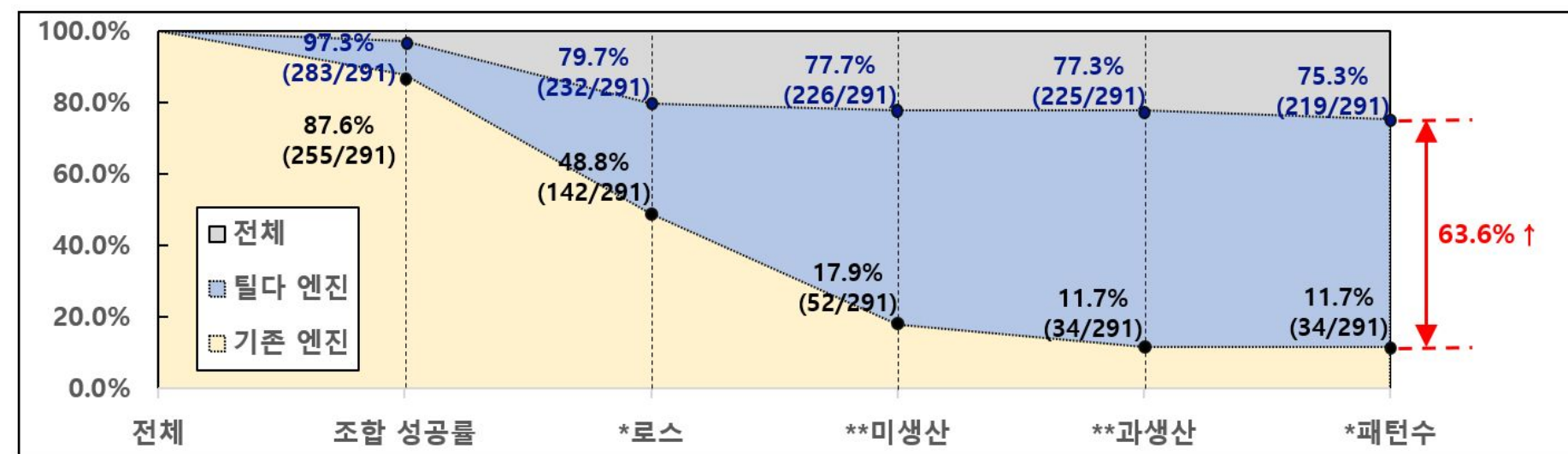


Hansol
한솔제지

- Order allocation optimization to reduce facility interruption rate and trim loss

ArgMax Actual Test Result

| | |
|------------------------|---------|
| Interruption rate | 29.4% ↓ |
| Trim loss | 23.4% ↓ |
| Over & underproduction | 100% ↓ |



Commodity Purchase Optimization

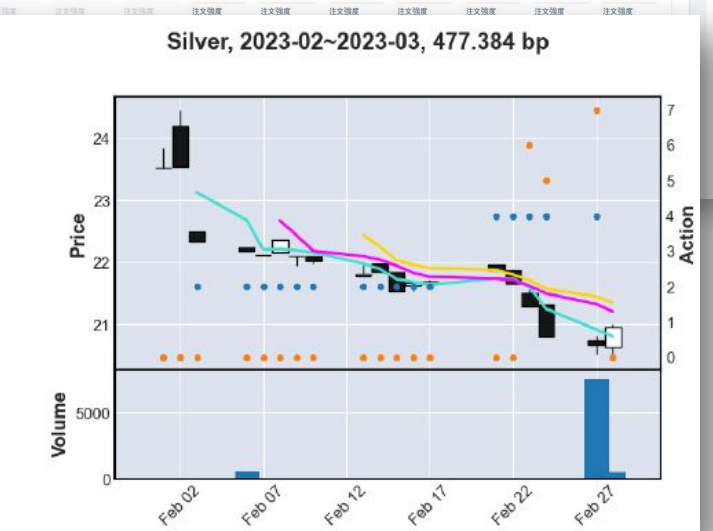
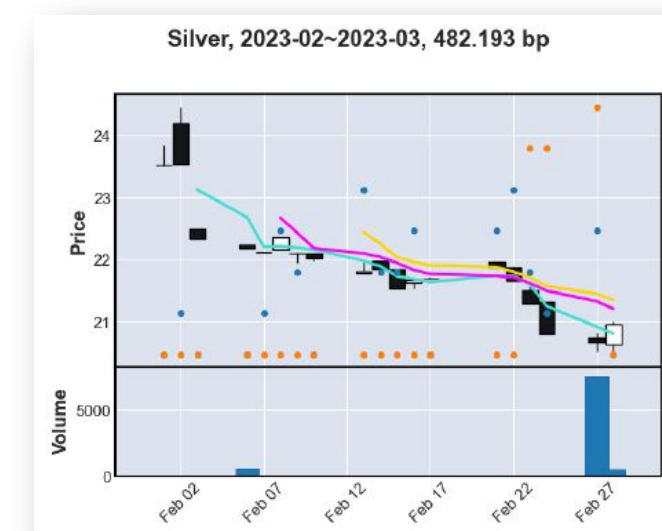
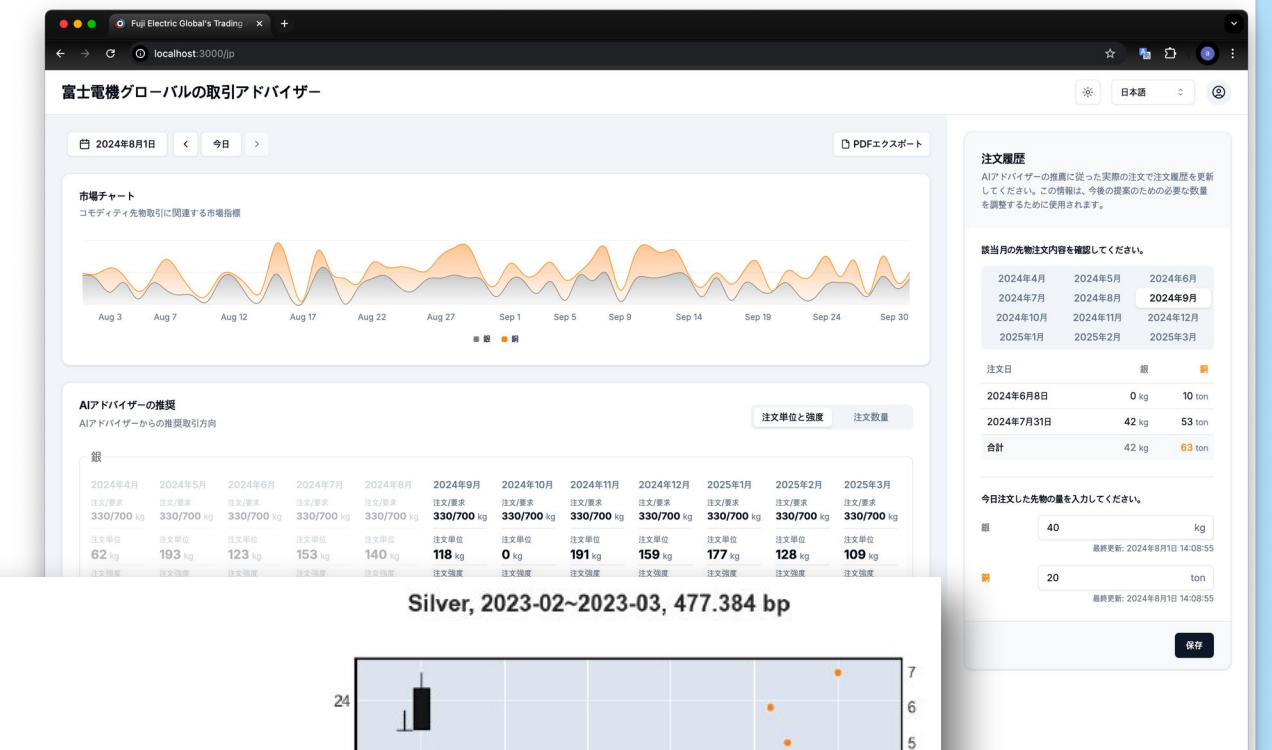


Fuji Electric
Innovating Energy Technology

- Ag & Cu purchase plan optimization to reduce cost

ArgMax Simulation Result

Performance 2.5% ↑



ArgMax® Success

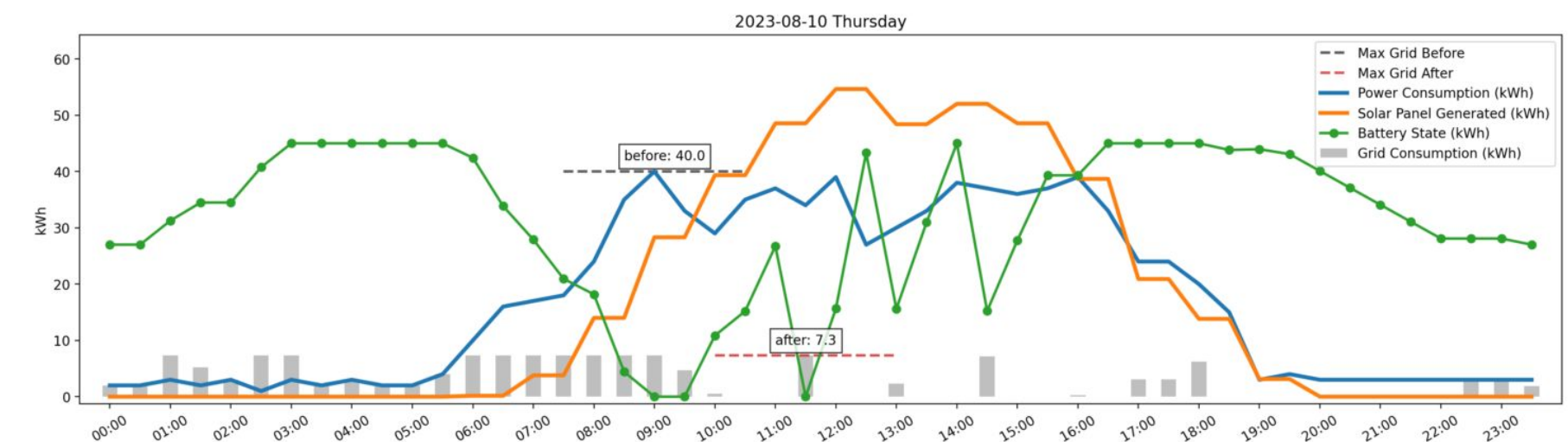
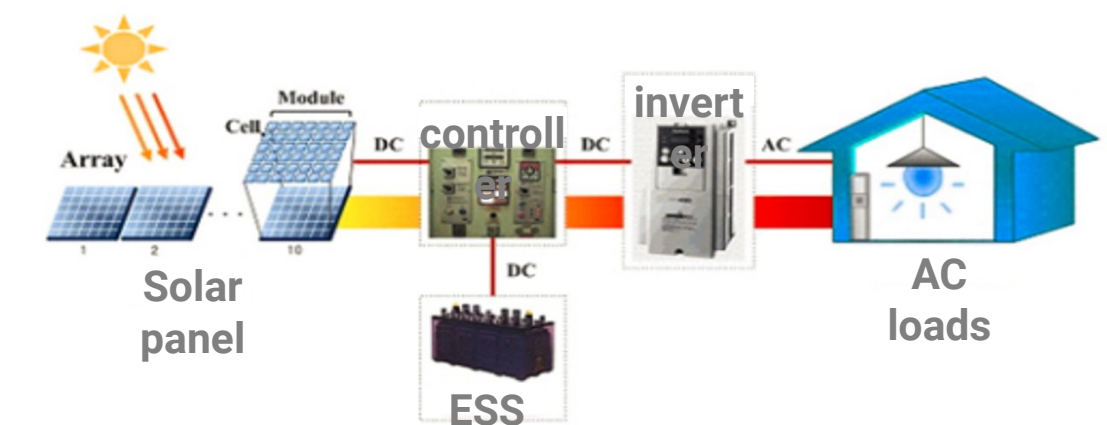
Optimal quotation & operation of self-consumption solar system



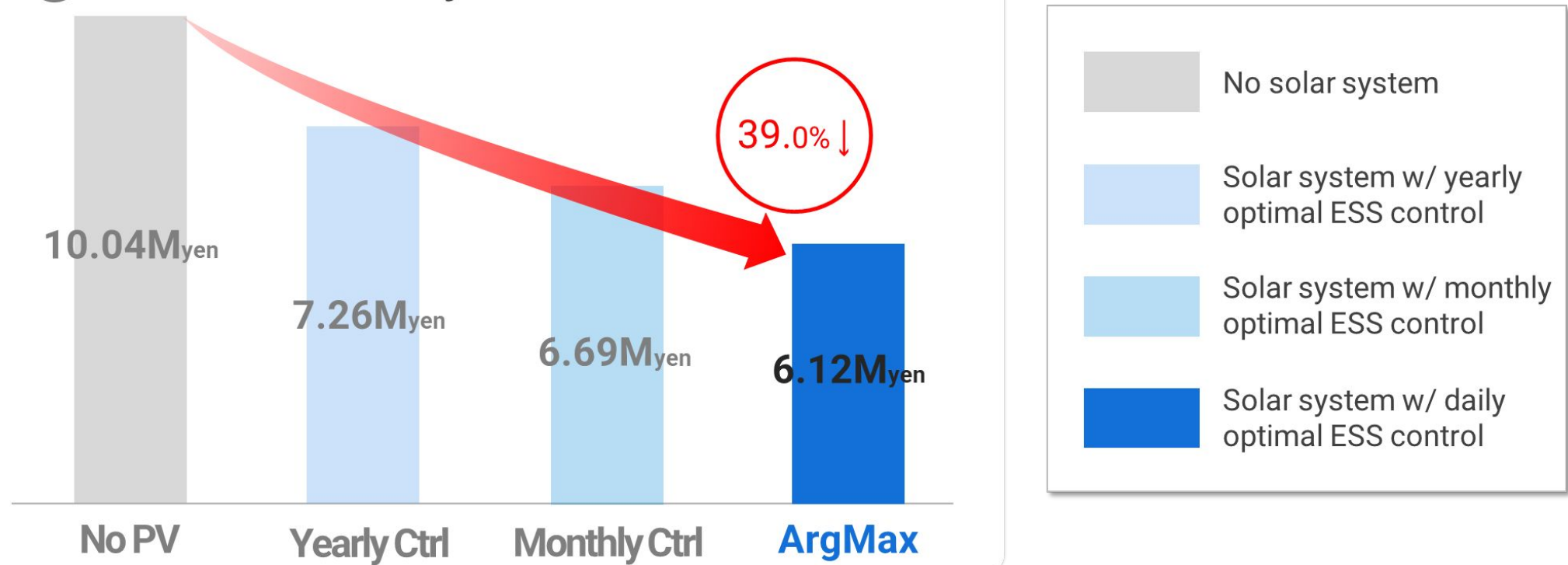
Solar System Plan & Control Optimization



- Japanese solar PV system market is changing from electricity sales to self-consumption purpose
- Consumer companies need the minimal system with optimal operations to reduce setup cost and electricity expenses
- EPCs require rapid quotes that they can present to their customers with clear and understandable justifications



Annual electricity bill

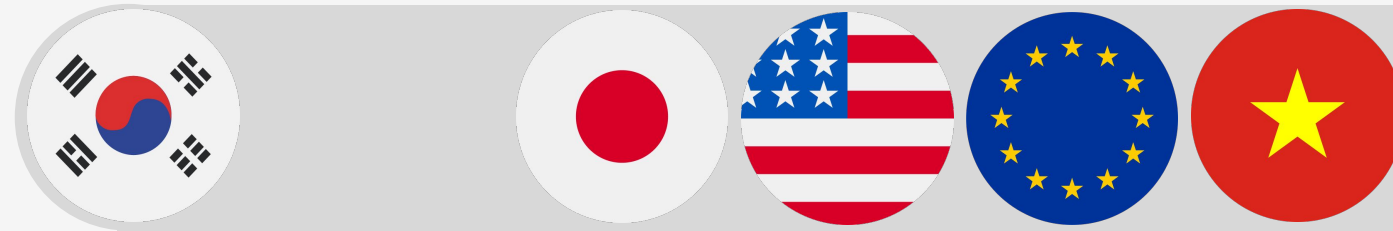


Growth



Plan

Sales projection with region-wise & domain-wise SaaS expansion



Customer Feedback

"Not just a solution provider, but we want Tilda to be a business partner for our digital transformation."

Custom
SaaS

\$230K

\$230K

\$500K

\$1.2M

\$7.7M

\$14M

2021

2022

2023

2024

2025

2026

2027



AI Championship (3rd)

Bigdata Startup (1st)

AI Testbed Korea (2nd)

Startup Solution Platform (2nd)

Best Startup (Woori bank)

Best Startup (D-Camp, June)

Team Tilda



Tilda



Ji-Ryang Chung, CEO

Work experience

- Tilda Corp. (2021-), Founder & CEO
- Minds&Company (2019-2020), AI adoption consulting firm, Partner
- Samsung Mobile (2011-2018), Principal engineer & Part leader

Education

- Texas A&M University (2004-2011), Computer Science (AI), PhD
- Seoul National University (1995-2004), Computer Science, BS

Team Leaders

Sang Hyun Lee
SaaS ML Team



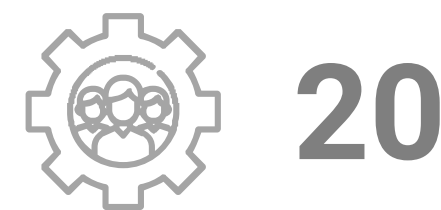
Experience
Manager @ Minds&Company

Min Jun Kim
PoC/Production ML Team



Experience
Engineer @ NotaAI

Members



20

Engineers - 17

Backoffice - 2
Global Sales (JPN) - 1

Investors



Collaborators, Advisors



The Team: who we are, what we do!
**We maximize efficiency, to impact
both our future and society's**

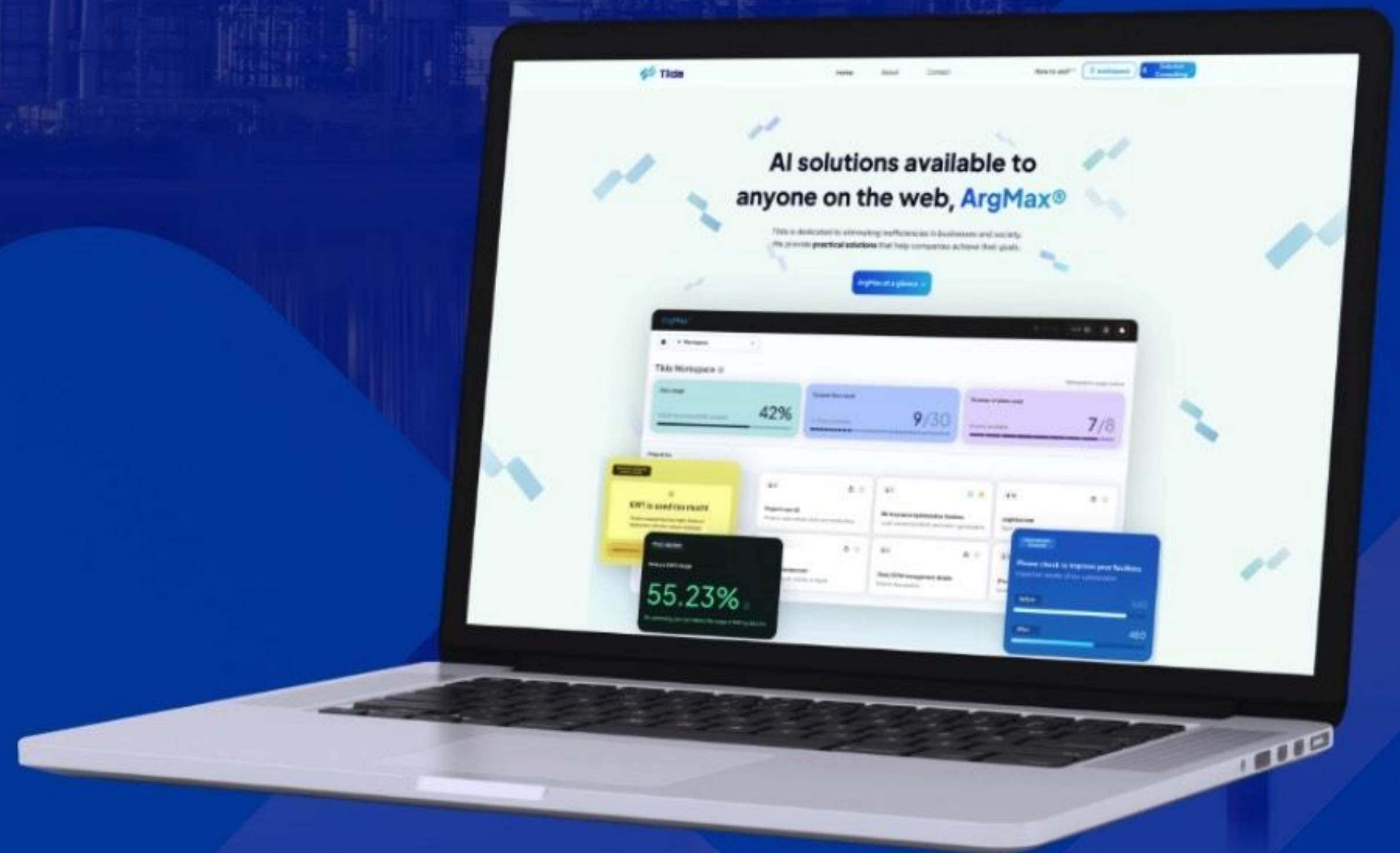


<https://www.tilda.co.kr>

jr.chung@tilda.co.kr



jr.chung@tilda.co.kr
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