

# Fresh Product Price Inform Service

## - NUGU FRESH

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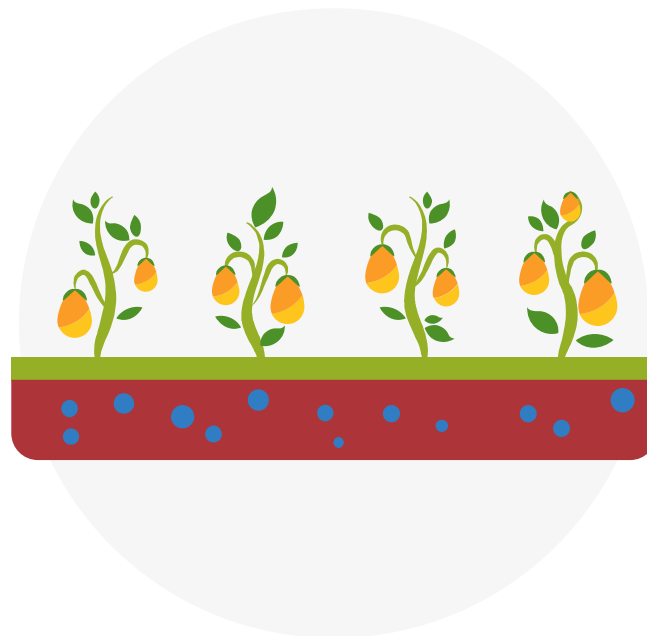
Kim Bong Kyun, Choi Hyun Ji



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# 1. Introduction

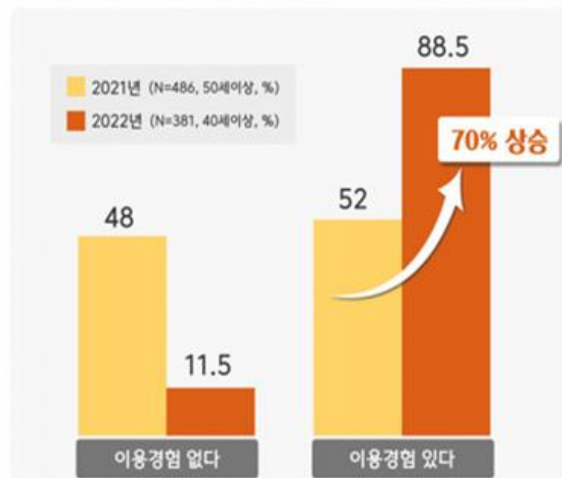


# Introduction - Motivation



새벽배송 이용경험 있다!  
작년보다 4060 이용자 70% 증가

■ 새벽배송 서비스 이용경험유무 21년/22년 비교 (주)양적응리코스



## Motivation

- ① 코로나19 사태 이후로 폭발적으로 증가하고 있는 비대면 배송 서비스
- ② 전자기기에 익숙한 2030 이용자 뿐만 아니라 4060의 중장년층에서도 큰 인기

BUT  
플랫폼 별로  
가격을 비교하는 서비스가 없고,  
마트의 가격보다 저렴한지 파악  
불가능

# Introduction - Goals



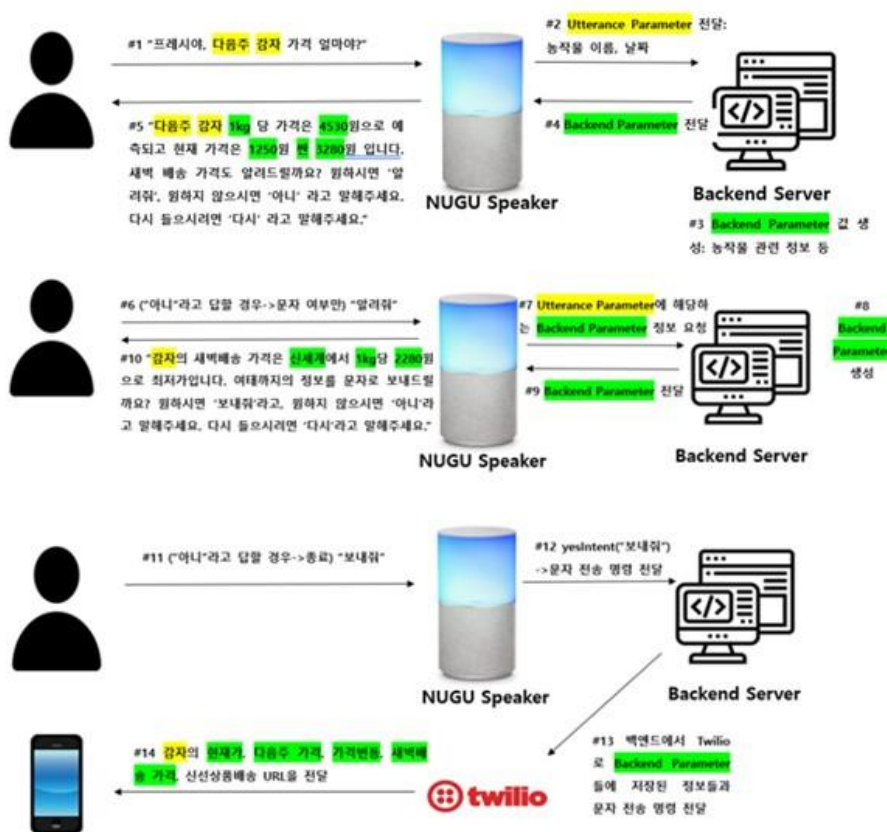
상품명: 000  
플랫폼 최저 가격: 00원  
마트 가격: 00원  
내일 가격: 000원



## Goals

- ① 중장년층도 접근하기 쉬운  
NUGU 스피커와 휴대폰 문자  
메시지로  
가격 비교 정보를 제공
  - ② 다음주(7일치)의 가격을 예측해  
가격 동향을 알고 구매시기를 결정  
가능
- SO
- 접근하기 가장 쉬운 플랫폼으로  
현재 및 미래 가격을 비교해  
합리적인 소비를 가능하게 하는  
서비스 제공

# Introduction - Service Scenario



[Web발신]

Sent from your Twilio trial account - \*NUGU-FRESH\*  
감자 1kg의 현재가: 3280원  
다음 주 가격 : 4530원  
가격 변동: -1250  
SSG 가격: 2280원  
URL: [https://www.ssg.com/item/itemView.ssg?itemId=1000005329157&siteNo=6001&salestrNo=2033&tlidSrchWd=%EB%B0%B0%EC%B6%94&srchPgNo=1&src\\_area=elist](https://www.ssg.com/item/itemView.ssg?itemId=1000005329157&siteNo=6001&salestrNo=2033&tlidSrchWd=%EB%B0%B0%EC%B6%94&srchPgNo=1&src_area=elist)

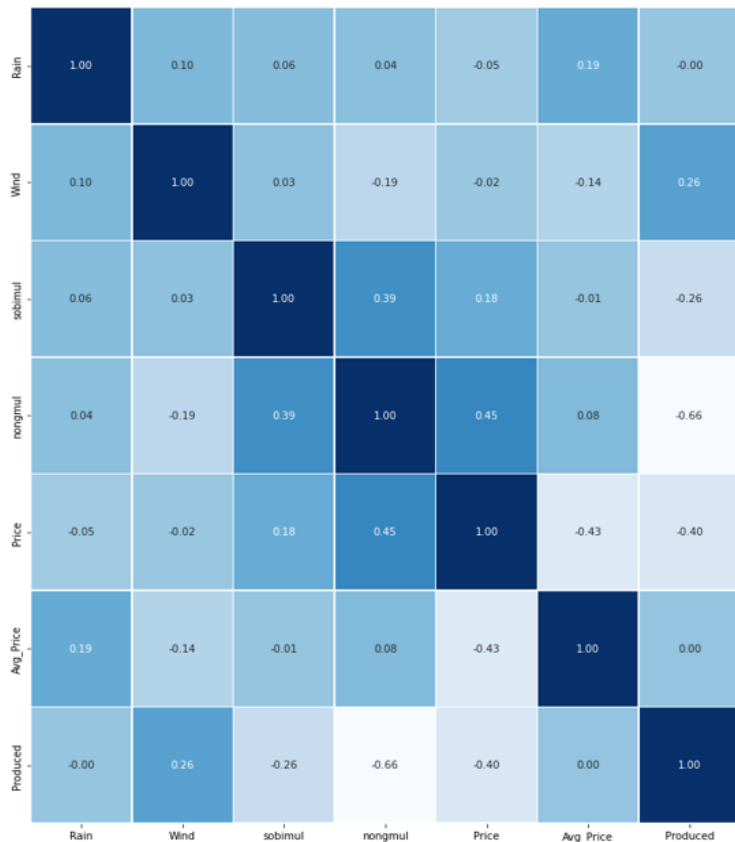
[Web발신]

Sent from your Twilio trial account - \*NUGU-FRESH\*  
쌀 10kg의 현재가: 25471원  
쿠팡 가격: 24890원  
URL: <https://www.coupang.com/vp/products/166996432?itemId=478240933&vendorId=4200250100&q=%EC%8C%80+10kg&itemsCount=36&searchId=2727ecb3b78c40c8bd7db7cfda442379&rank=0&isAddedCart=>

## 2. Datasets & Data Preprocessing



# Datasets



	VIF Factor	features
0	1.312380	Rain
1	5.450449	Wind
2	11.243204	Sup
3	14.792895	Temp
4	13.400769	Oil
5	8.095756	sobimul
6	9.725722	nongmul
7	5.187378	Price
8	7.827645	Avg_Price
9	7.898909	Produced

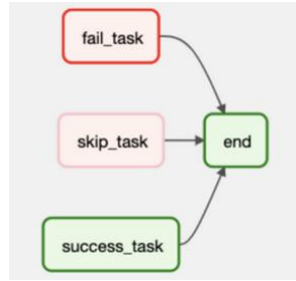


	VIF Factor	features
0	1.312380	Rain
1	5.450449	Wind
<del>2</del>	<del>11.243204</del>	<del>Sup</del>
<del>3</del>	<del>14.792895</del>	<del>Temp</del>
<del>4</del>	<del>13.400769</del>	<del>Oil</del>
5	8.095756	sobimul
6	9.725722	nongmul
7	5.187378	Price
8	7.827645	Avg_Price
9	7.898909	Produced

1. 농산물 가격 정보 데이터 ( KAMIS )
2. 기상 정보 데이터 ( 기상청 )
3. 전체 및 농산물 물가 상승률 ( KOSIS )
4. 전년도 생산량 정보 ( KOSIS )



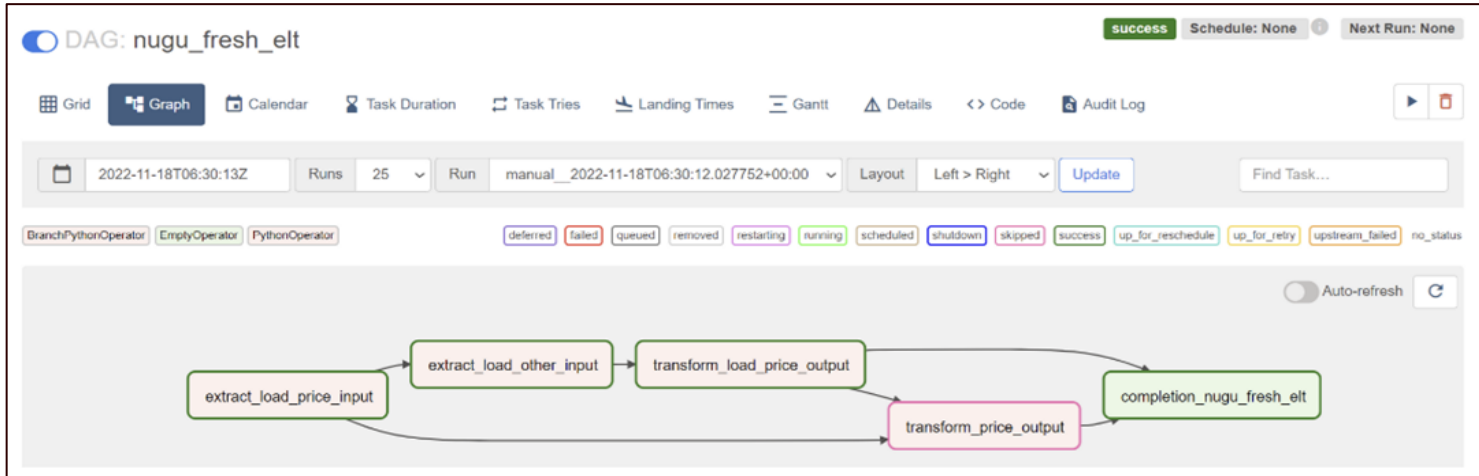
# Data Preprocessing ( with Apache Airflow )



**“Automates data processing”**

**“Resolving dependency issues”**

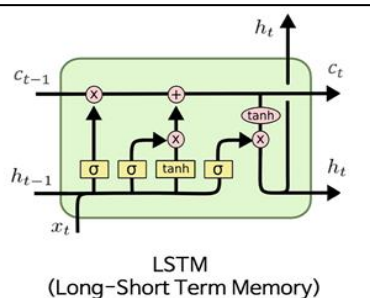
**“Easy to identify errors with own UI”**



### **3. AI Algorithm & Evaluation**



# AI Algorithm ( with Keras )



**“10 years of utilization of price, weather, price information, etc”**

**“Long-term memory retention through LSTM stateful mode”**

```
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Input, LSTM, Dense, Dropout, Activation
from tensorflow import keras
from tensorflow.keras import layers
input_columns = 10

def build_model(hp):
    model = keras.Sequential()
    model.add(layers.LSTM(units=hp.Int('units', min_value=32, max_value=64, step=32), batch_input_shape=(7, 7, input_columns), stateful=True, return_sequences=True))
    model.add(Dropout(0.1))
    for i in range(hp.Int('hidden_depth', min_value=1, max_value=2, step=1)):
        model.add(LSTM(units=hp.Int('hidden_units', min_value=32, max_value=64, step=32), return_sequences=True, stateful=True))
        model.add(Dropout(0.1))
    model.add(Dense(1))
    model.compile(optimizer=keras.optimizers.Adam(hp.Choice('learning_rate', values=[1e-2, 1e-3])), loss='mse', metrics=['mae'])
    return model
```

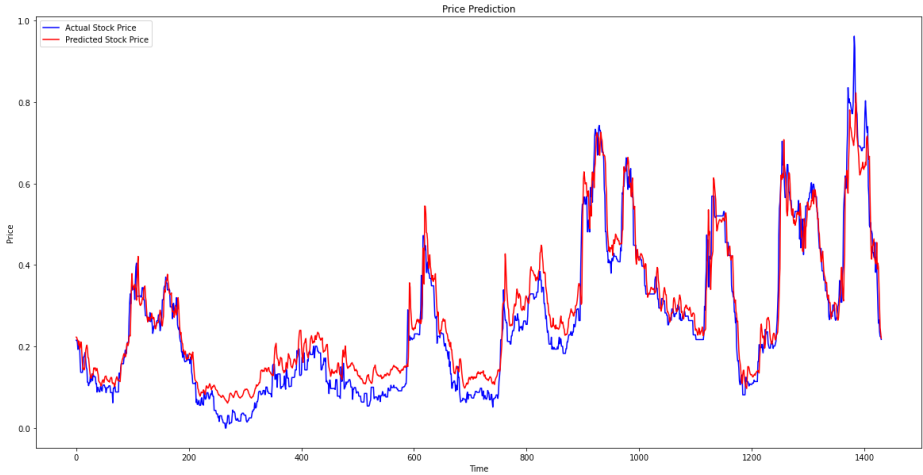
# AI Evaluation

	Potato	Onion	Cabbage	Radish	Rice
RMSE	0.0638934	0.0697005	0.0433391	0.0664019	0.0317641

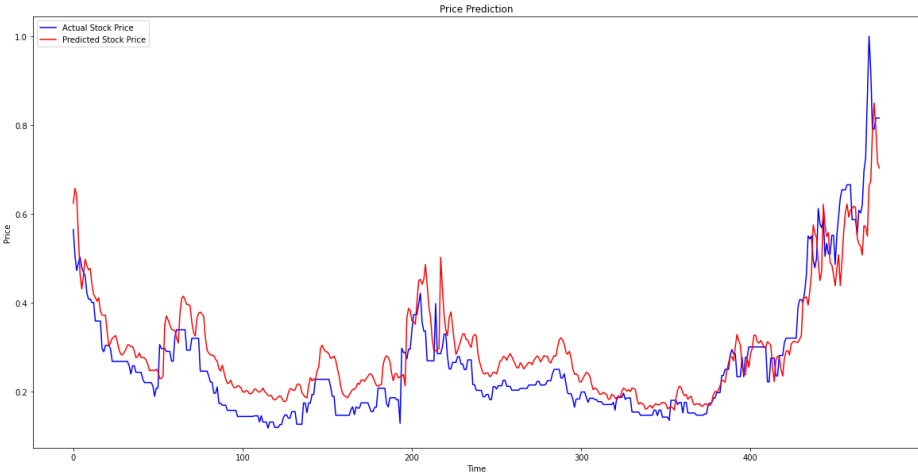
RMSE of training data

	Potato	Onion	Cabbage	Radish	Rice
RMSE	0.0646031	0.0738700	0.1027203	0.0408240	0.0556046

RMSE of test data

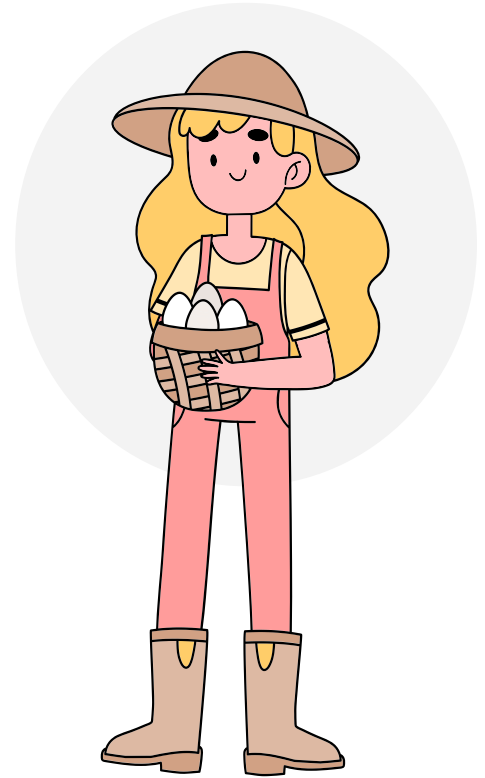


Graph of Cabbage price training data

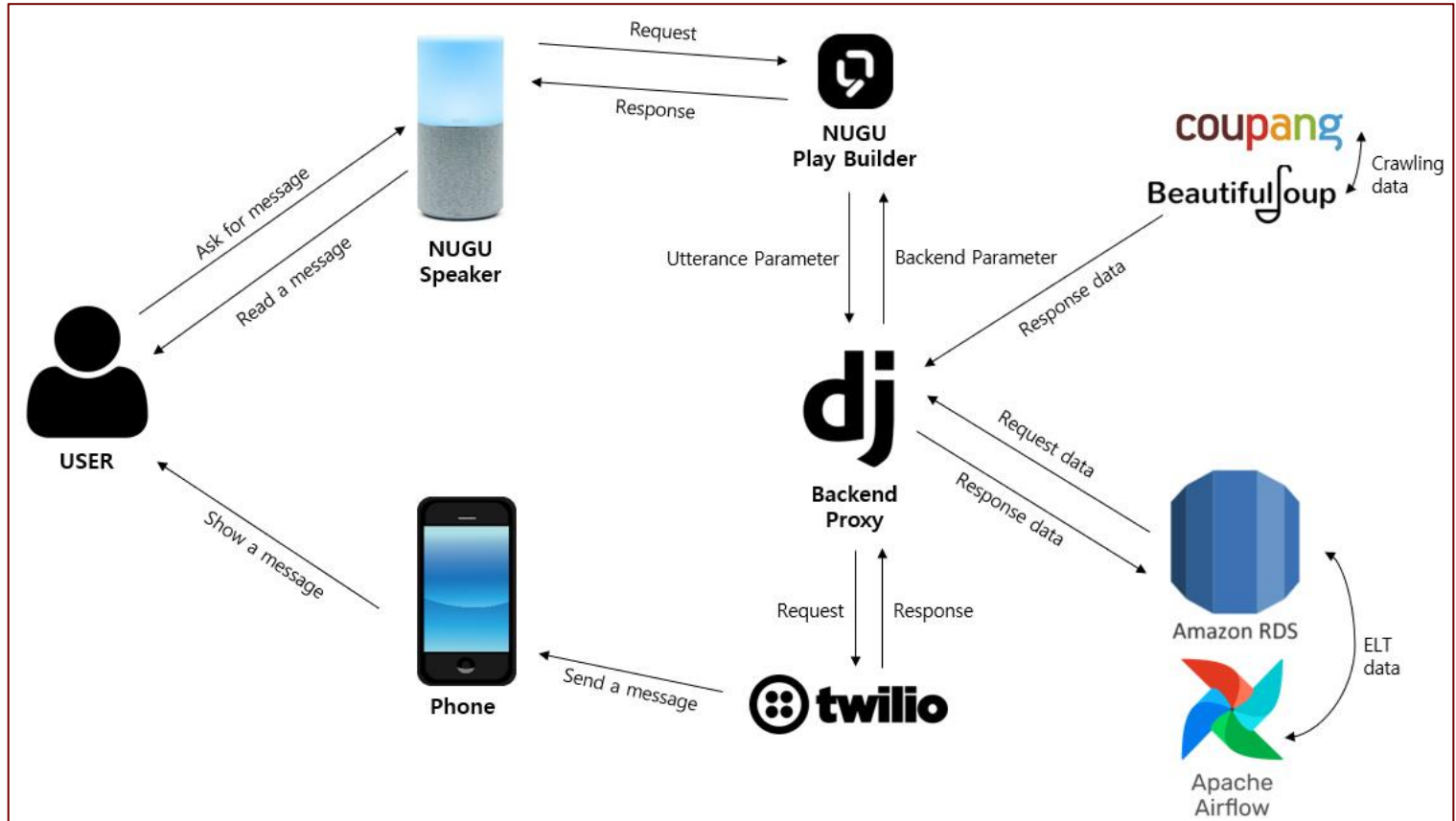


Graph of Cabbage price test data

## 4. Methodology



# System Architecture



# Methodology - NUGU Play Builder

## 1. Create NUGU FRESH Play

Create NUGU FRESH PLAY and Enter basic information



Set up NUGU FRESH Play start-up and end-time utterance settings

## 2. Define User Utterance Model

The process of anticipating what the user will say, creating training data, and learning the engine based on that data

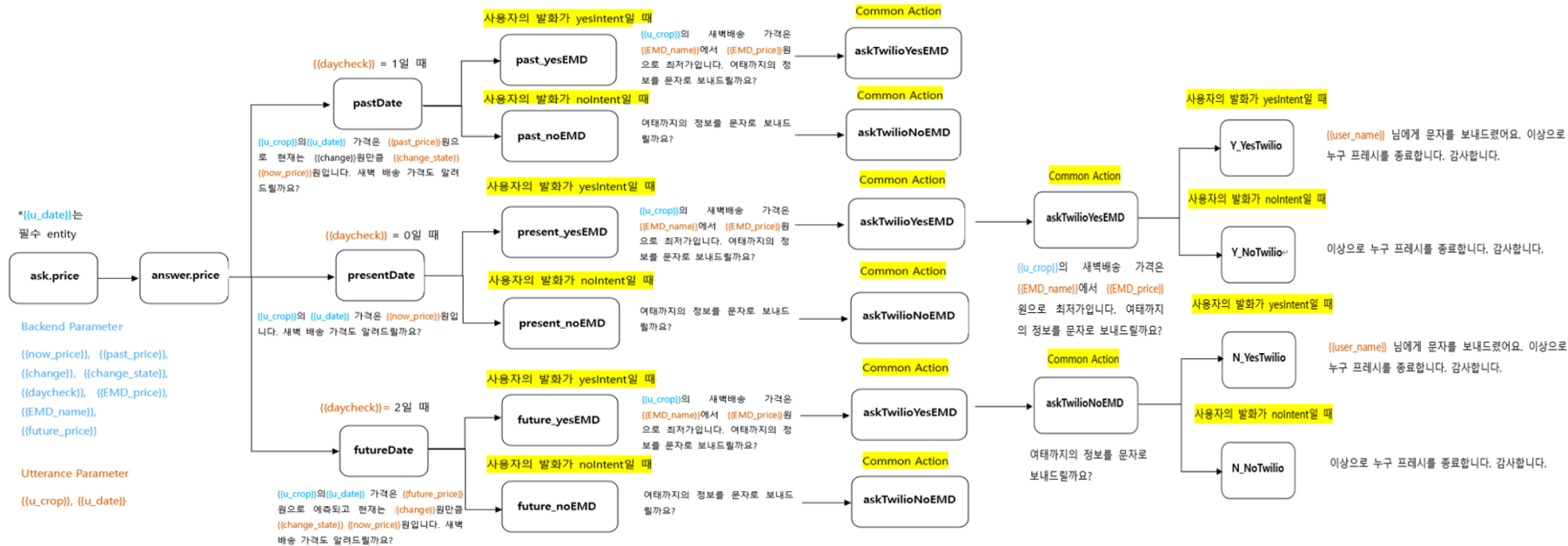
### 1) Create Intent

“Intent” refers to the user's intention, and a specific “Action” is performed according to Intent. There are Intent called "ask.price" that asks the first question and other intents that bring up different “Branch actions” through subsequent answers.

### 2) Set Entity Types

“CROP” with 5 kinds of agricultural product information and “DATE” with date information are set as their respective Entities.

# Methodology - NUGU Play Builder





## 5. Conclusion & Scalability

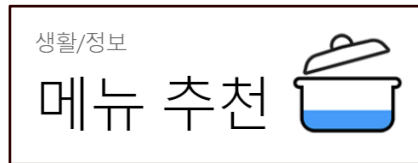
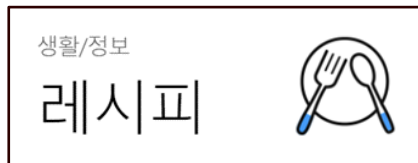


**NUGU FRESH**과 함께라면 최적의 구매시기, 플랫폼으로  
합리적인 신선 제품 구매가 가능합니다!

### Scalability



Connect with menu recommendation and recipe functions existing in NUGU APP  
→ More reasonable consumption



Including a variety of other crops and fruits for prediction  
→ Wider use



Response information not only to SMS but also to be printed

**Thank you !!!**

