AI Text Summarization API

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AI Text Summarization API

Contents

1. Overview

The AI Text Summarization service takes text as an input and returns a computer-generated summary that represents the most important information in the original content. We use Artificial Intelligence, including Machine Learning, Deep Learning, Natural Language Processing (NLP), and Natural Language Generation (NLG) to achieve well-constructed and human-readable output. By merging FactSet's best-in-class data with cutting-edge AI technologies, AI Text Summarization provides machine-generated headlines or summaries of text documents.

Managers or analysts can use AI Text Summarization to quickly gather text highlights or decide whether to read an article or investigate a new topic. Product developers and engineers can use AI Text Summarization to create headlines and story snippets to populate text applications.

The AI Text Summarization service accepts user queries through a Swagger-based restful API (details below).

a. Methodology

The AI Text Summarization machine learning model was trained with one-page text summaries such as articles from CNN and DailyMail. It was also trained with the eXtreme Summarization (XSUM) open-source dataset along with FactSet's StreetAccount headlines and summaries. While the service can provide summaries of any document, it will provide the best results when provided with text articles as the input. The AI Text Summarization service will return either a short headline-length summary, a 2-3 sentence summary, or both. Below are sample inputs and outputs of the Summarization service. This is for illustrative purposes only.

b. Sample AI Text Summarization Functionality

Sample Input:

Advanced Energy Transforms Indoor Farming With Intelligent New Lighting Power and Control System Friday, December 11, 2020 01:00:00 PM (GMT)Innovative technology breaks down barriers to indoor, vertical and greenhouse farming by reducing power consumption, cutting costs and increasing crop yield Advanced Energy (Nasdaq: AEIS) – a global leader in highly engineered, precision power conversion, measurement, and control solutions – today unveiled its newest lighting and power control system for indoor, vertical and greenhouse farming. This press release features multimedia. Advanced Energy's new Artesyn iTS provides the industry's first solution for switching or sharing a single power source between two different rooms. This reduces installation costs by cutting the number of iHP power supplies needed in half and it substantially reduces ongoing utility costs. (Photo: Business Wire)AE's new lighting and power system transforms the use of LED technology in horticultural lighting systems, which plays a fundamental role in cutting-edge farming practices that can address production challenges in food, pharmaceutical ingredients, plants and flowers. Utilizing AE's system, customers reduce their power conversion costs by as much as 50 percent, significantly lower installation and operating costs, and increase the quality of crop yield. "Our groundbreaking lighting, power and control system delivers significant improvements over conventional lighting solutions and opens up new opportunities for the industry," said Joe Voyles, vice president, industrial marketing, at Advanced Energy. "We are transforming our customers' operations by both reducing the amount of needed equipment and improving the efficiency of the lighting systems, thereby reducing cost and energy spend. Not only do these innovative new products increase the efficiency and quality of fruit and vegetable production, but they also open the door to establishing indoor farming facilities in harsh environments anywhere in the world." The new system consists of the patented Artesyn iTS (intelligent Transfer Switch) and iHPS configurable power supply.

Alongside Artesyn's compact new 12 kW 300 VDC module, AE delivers a cost-effective platform for the most advanced indoor farming applications. The system is estimated to produce a 38 percent savings to lighting power and control installation cost, while eliminating substantial amounts of wasted energy. The new iHPS is a "short" version of AE's market-leading iHP power supply. The shorter design allows for more space within the lighting and power cabinet for other crucial components, reduces the weight and cost, and increases the life of the system. The new iTS provides the industry's first solution for switching or sharing a single power source between two different rooms. This reduces installation costs by cutting the number of iHP power supplies needed in half and it substantially reduces ongoing utility costs.

Sample output:

Advanced Energy unveiled its newest lighting and power control system for indoor, vertical and greenhouse farming.

The new system consists of the patented Artesyn iTS (intelligent Transfer Switch) and iHPS power supply. Alongside Artesyn's compact new 12 kW 300 VDC module, AE delivers a cost-effective platform for the most advanced indoor farming applications. The system is estimated to produce a 38 percent savings to lighting power and control installation cost, while eliminating substantial amounts of wasted energy.

c. Types of Summarization

The AI Text Summarization service currently offers three different types of summarization:

Headline

This model is trained on StreetAccount headlines. The outputs will generally be a single sentence, in the style used by the StreetAccount team.

Summary

This model is trained on StreetAccount stories. The outputs will be long and are generally in the style used by the StreetAccount team.

Headline and Summary

Using this option, the API can return the headline and summary outputs at the same time.

d. Accessing the AI Text Summarization API

The FactSet AI Text Summarization service is accessible to authorized FactSet clients only. When accessing the service, please make sure that your account has been enabled for the AI Text Summarization API. If not, calls to the AI Text Summarization service will fail. Please contact your FactSet representative if you encounter authentication issues while calling the AI Text Summarization service.

e. Document Size and Other Specifications

Currently, this service only supports English language documents. It expects the input text in plain text. The minimum input length is 100 words. The maximum input length is 1,024 words. Any text beyond the maximum length will not be considered for summarized output.

f. Expected Results

The service is expected to produce a natural language output that highlights the key points of the text passed in. Please let us know if you encounter a headline or summary that misses key points, includes less relevant information, or does not flow well linguistically. This will be a great help in improving the service over time.

2. Submitting a Request to the AI Text Summarization API

The AI Text Summarization service supports a restful HTTP-based API.

a. AI Text Summarization Endpoints

Production URLs for the service:

- https://api.factset.com/cognitive/nlp/v1/summarization/headline
- https://api.factset.com/cognitive/nlp/v1/summarization/summary
- https://api.factset.com/cognitive/nlp/v1/summarization/headline-and-summary
- https://api.factset.com/cognitive/nlp/v1/summarization/{result_id}

The service supports HTTP POST for the Headline, Summary, and Headline-and-summary endpoints. The service supports HTTP GET for the Result ID endpoint.

b. Building a Request-Payload for the AI Text Summarization API

A sample JSON payload to the FactSet AI Text Summarization service follows the template below:

Input{

text*

String (required)

example: Advanced Energy Transforms Indoor Farming With Intelligent New Lighting Power and Control System Friday, December 11, 2020 01:00:00 PM (GMT)Innovative technology breaks down barriers to indoor, vertical and greenhouse farming by reducing power consumption, cutting costs and increasing crop yield Advanced Energy (Nasdaq: AEIS) – a global leader in highly engineered, precision power conversion, measurement, and control solutions – today unveiled its newest lighting and power control system for indoor, vertical and greenhouse farming. This press release features multimedia. Advanced Energy's new Artesyn iTS provides the industry's first solution for switching or sharing a single power source between two different rooms. This reduces installation costs by cutting the number of iHP power supplies needed in half and it substantially reduces ongoing utility costs. (Photo: Business Wire)AE's new lighting and power system transforms the use of LED technology in horticultural lighting systems, which plays a fundamental role in cutting-edge farming practices that can address production challenges in food, pharmaceutical ingredients, plants and flowers. Utilizing AE's system, customers reduce their power conversion costs by as much as 50 percent, significantly lower installation and operating costs, and increase the quality of crop yield. \"Our groundbreaking lighting, power and control system delivers significant improvements over conventional lighting solutions and opens up new opportunities for the industry,\" said Joe Voyles, vice president, industrial marketing, at Advanced Energy. \"We are transforming our customers' operations by both reducing the amount of needed equipment and improving the efficiency of the lighting systems, thereby reducing cost and energy spend. Not only do these innovative new products increase the efficiency and quality of fruit and vegetable production, but they also open the door to establishing indoor farming facilities in harsh environments anywhere in the world.\" The new system consists of the patented Artesyn iTS (intelligent Transfer Switch) and iHPS configurable power supply. Alongside Artesyn's compact new 12 kW 300 VDC module, AE delivers a cost-effective platform for the most advanced indoor farming applications. The system is estimated to produce a 38 percent savings to lighting power and control installation cost, while eliminating substantial amounts of wasted energy. The new iHPS

```
                    is a \"short\" version of AE's market-leading iHP power supply.
                    The shorter design allows for more space within the lighting and
                    power cabinet for other crucial components, reduces the weight
                    and cost, and increases the life of the system. The new iTS
                    provides the industry's first solution for switching or sharing
                    a single power source between two different rooms. This reduces
                    installation costs by cutting the number of iHP power supplies
                    needed in half and it substantially reduces ongoing utility
                    costs.

                    English plain text to summarize. Maximum of 1,024 words.

}
```

Sample Payload

Below is a sample document that we need to summarize:

Advanced Energy Transforms Indoor Farming With Intelligent New Lighting Power and Control System Friday, December 11, 2020 01:00:00 PM (GMT)Innovative technology breaks down barriers to indoor, vertical and greenhouse farming by reducing power consumption, cutting costs and increasing crop yield Advanced Energy (Nasdaq: AEIS) – a global leader in highly engineered, precision power conversion, measurement, and control solutions – today unveiled its newest lighting and power control system for indoor, vertical and greenhouse farming. This press release features multimedia. Advanced Energy's new Artesyn iTS provides the industry's first solution for switching or sharing a single power source between two different rooms. This reduces installation costs by cutting the number of iHP power supplies needed in half and it substantially reduces ongoing utility costs. (Photo: Business Wire)AE's new lighting and power system transforms the use of LED technology in horticultural lighting systems, which plays a fundamental role in cutting-edge farming practices that can address production challenges in food, pharmaceutical ingredients, plants and flowers. Utilizing AE's system, customers reduce their power conversion costs by as much as 50 percent, significantly lower installation and operating costs, and increase the quality of crop yield. "Our groundbreaking lighting, power and control system delivers significant improvements over conventional lighting solutions and opens up new opportunities for the industry," said Joe Voyles, vice president, industrial marketing, at Advanced Energy. "We are transforming our customers' operations by both reducing the amount of needed equipment and improving the efficiency of the lighting systems, thereby reducing cost and energy spend. Not only do these innovative new products increase the efficiency and quality of fruit and vegetable production, but they also open the door to establishing indoor farming facilities in harsh environments anywhere in the world." The new system consists of the patented Artesyn iTS (intelligent Transfer Switch) and iHPS configurable power supply. Alongside Artesyn's compact new 12 kW 300 VDC module, AE delivers a cost-effective platform for the most advanced indoor farming applications. The system is estimated to produce a 38 percent savings to lighting power and control installation cost, while eliminating substantial amounts of wasted energy. The new iHPS is a "short" version of AE's market-leading iHP power supply. The shorter design allows for more space within the lighting and power cabinet for other crucial components, reduces the weight and cost, and increases the life of the system. The new iTS provides the industry's first solution for switching or sharing a single power

source between two different rooms. This reduces installation costs by cutting the number of iHP power supplies needed in half and it substantially reduces ongoing utility costs.

A request payload for this sample document is constructed as a JSON-formatted query which can be saved as a file (textsummarization.json):


```
{
    "text": "Advanced Energy Transforms Indoor Farming With Intelligent New Lighting Power and Control System Friday, December 11, 2020 01:00:00 PM (GMT)Innovative technology breaks down barriers to indoor, vertical and greenhouse farming by reducing power consumption, cutting costs and increasing crop yield Advanced Energy (Nasdaq: AEIS) – a global leader in highly engineered, precision power conversion, measurement, and control solutions – today unveiled its newest lighting and power control system for indoor, vertical and greenhouse farming. This press release features multimedia. Advanced Energy's new Artesyn iTS provides the industry's first solution for switching or sharing a single power source between two different rooms. This reduces installation costs by cutting the number of iHP power supplies needed in half and it substantially reduces ongoing utility costs. (Photo: Business Wire)AE's new lighting and power system transforms the use of LED technology in horticultural lighting systems, which plays a fundamental role in cutting-edge farming practices that can address production challenges in food, pharmaceutical ingredients, plants and flowers. Utilizing AE's system, customers reduce their power conversion costs by as much as 50 percent, significantly lower installation and operating costs, and increase the quality of crop yield. \"Our groundbreaking lighting, power and control system delivers significant improvements over conventional lighting solutions and opens up new opportunities for the industry,\" said Joe Voyles, vice president, industrial marketing, at Advanced Energy. \"We are transforming our customers' operations by both reducing the amount of needed equipment and improving the efficiency of the lighting systems, thereby reducing cost and energy spend. Not only do these innovative new products increase the efficiency and quality of fruit and vegetable production, but they also open the door to establishing indoor farming facilities in harsh environments anywhere in the world.\" The new system consists of the patented Artesyn iTS (intelligent Transfer Switch) and iHPS configurable power supply. Alongside Artesyn's compact new 12 kW 300 VDC module, AE delivers a cost-effective platform for the most advanced indoor farming applications. The system is estimated to produce a 38 percent savings to lighting power and control installation cost, while eliminating substantial amounts of wasted energy. The new iHPS is a \"short\" version of AE's market-leading iHP power supply. The shorter design allows for more space within the lighting and power cabinet for other crucial components, reduces the weight and cost, and increases the life of the system. The new iTS provides the industry's first solution for switching or sharing a single power source between two different rooms. This reduces installation costs by cutting the number of iHP power supplies needed in half and it substantially reduces ongoing utility costs."
}
```

c. Sending a Sample Request to the AI Text Summarization API

Below is a command using Curl to send a POST request to the “Headline and Summary” endpoint using the sample input payload from a JSON file (textsummarization.json).

```
curl -s 'POST' \
  'https://api.factset.com/cognitive/nlp/v1/summarization/headline-and-summary' \
  -d @textsummarization.json
  -H 'Content-Type: application/json' \
```

d. Output Response from the AI Text Summarization API

In response to a valid request, the AI Text Summarization service returns a unique Result ID of the input text in JSON format:

Response

```
{
    summary             string
                        example: ade3fa5a-13da-4620-
                        82c7-d4de709ef1e8

                        Result ID to be used to
                        retrieve the summary of the
                        input text.

}
```

Sample Response from the AI Text Summarization API

For the given sample payload, the AI Text Summarization service will return a response in the following format:

```
   {
     "summary": "ade3fa5a-13da-4620-82c7-d4de709ef1e8",
   }
```

e. Using the Result ID to Retrieve the Summary Text

Once the Result ID has been retrieved, use Curl to send a GET request to the “Result” endpoint using the Result ID.

```
curl -X 'GET' \
  'https://api.factset.com/cognitive/nlp/v1/summarization/result/ade3fa5a-13da-4620-82c7-d4de709ef1e8' \
  -H 'accept: application/json'
```

Sample Response from the AI Text Summarization API

For the given Result ID, the AI Text Summarization service will return a response in the following format (example below is a headline and summary response):


```
{
  "headline": "Advanced Energy announces new lighting and power control system for indoor, vertical and gree
nhouse farming.",
  "summary": "Advanced Energy unveiled its newest lighting and power control system for indoor, vertical and
greenhouse farming. The new system consists of the patented Artesyn iTS (intelligent Transfer Switch) and iH
PS power supply. Alongside Artesyn's compact new 12 kW 300 VDC module, AE delivers a cost-effective platform
for the most advanced indoor farming applications. The system is estimated to produce a 38 percent savings t
o lighting power and control installation cost, while eliminating substantial amounts of wasted energy."
}
```


3. A Sample Client for the AI Text Summarization API

Sample Python code for a simple client utilizing the FactSet AI Text Summarization service

```
import requests
from requests.auth import HTTPBasicAuth
import time

def extract_from_text(doc_text,
                      fds_summarization_url = 'https://api.factset.com/cognitive/nlp/v1/summarization/'):

    payload = {'text': doc_text}
    response_json = None
    resp = requests.post(f"{fds_summarization_url}/summary", json=payload, auth=HTTPBasicAuth('USERNAME-SERIAL', 'API-KEY'))
    if not resp:
```

```
    status_code = resp.status_code if (resp is not None) else -1
    raise ValueError(f'Received unexpected response from service: status_code: {status_code}')

response_json = resp.json()
result_id= response_json['summary']

while(True):
    resp = requests.get(f"{fds_summarization_url}/result/{result_id}")
            if not resp:
                status_code = resp.status_code if (resp is not None) else -1
                raise ValueError(f'Received unexpected response from service: status_code: {status_code}')
            if resp.text!='Processing':
                return resp.json()
    time.sleep(0.5)
```