daffodil

Success Story

Developing an AI-based data management solution to remove redundancy from data points

Client:
A US based CRM Solution Company

Industry:
Computer Software

Country:
US

Our Role:
Product Engineering

About the Client

The client is a leading provider of CRM, CMS, digital marketing, and revenue generation solutions for Destination Marketing Organizations (DMOs). The company has 1000+ clients from the travel, tourism, and convention marketing industry from six continents.

It partners with destinations & their agencies to engage stakeholders, attract visitors, and win bids for conventions & events.

Key Facts

300,000+	98.8%	80%
records analyzed	accuracy rate	more efficient than manual work

Services Used

- Software Engineering
- Artificial Intelligence
- Data Management

Technology Stack

- Node.js
- Microsoft SQL Server
- Python
- TensorFlow
- React
- Keras
- GraphQL
- Flask
- #C
- Machine Learning

The Situation

Data is arguably the most important tool available to a business; provided that it is accurate, updated and non-redundant, and usable. The client had one of the largest repositories of information on organizations and their meetings & events. The database had over 150,000+ meeting histories and data from over 160,000+ organizations that would help DMOs in lead generation for future events.

However, this database had records that were not of much help as the data was redundant and related to similar organizations.

Thus a record linkage solution was required to check for data points that were common and if the records were linked or not.

- The client wanted to build a Nodejs-based solution that can help to identify and bring together duplicate records from the database. With this requirement, they reached out to team Daffodil for building a solution that looks for duplicate organizations and meeting records in the database.

The Solution

Daffodil Software, on analyzing the requirement, proposed the idea of building a self-learning, AI-based record linkage solution. A technical proposal was shared by the team at Daffodil that illustrated how the idea can be executed using the BERT model. The power and advantages of developing an AI-based solution were exhibited through a result comparison with a NodeJS application.

Team Daffodil developed two different BERT models for merging organizations and meeting records with similar entities. Bidirectional Encoder Representations from Transformers (BERT) is a transformer-based machine learning technique for natural language processing (NLP) pre-training.

Building the BERT Model for Organizations

Daffodil started by analyzing the possibilities in which the organization data may exist. The organization names had text, numbers, and Unicode characters. Also, the database had entries made in short form. To remove unwanted entries from the database, text analysis, and data cleaning was performed on it. The data was then fed to different BERT models to analyze which BERT model gave the accurate output.

Manually, this task would have taken 60+ days to complete. With the NodeJS solution, the process would take 2-3 hours but with no idea of score accuracy (as the solution won't grow with data and time).

With the AI solution, identifying and merging similar entities took 4-6 hours with 99% accuracy. The best part about the BERT model was its accuracy would remain consistent, irrespective of the database's growth.

Building the BERT Model for Meetings

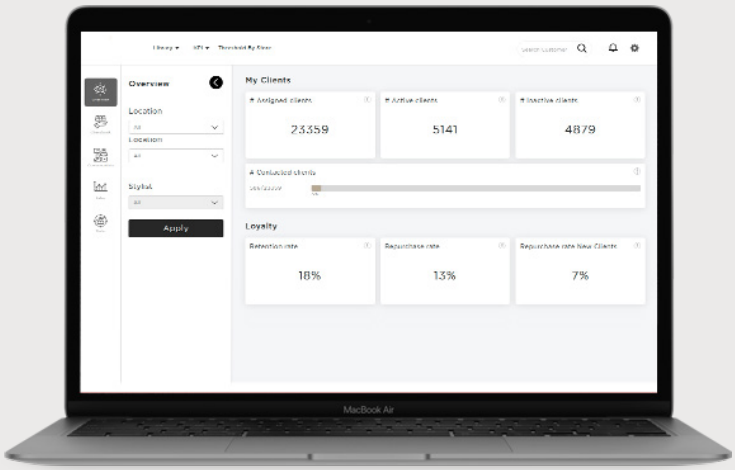
For every meeting, the date and time would vary and these were the only fields that were available for all the records. The meeting database was fed to a variety of models – Convolutional Neural Network (CNN), Sequential Model, Random Forest, and Decision Trees. These models were tested with 30,000 records to figure out which one offers the accurate output. With the NodeJS solution, this task would have taken 10 hours to complete and with the AI technology, the same task took over 24 hours with an accuracy of 98.8%.

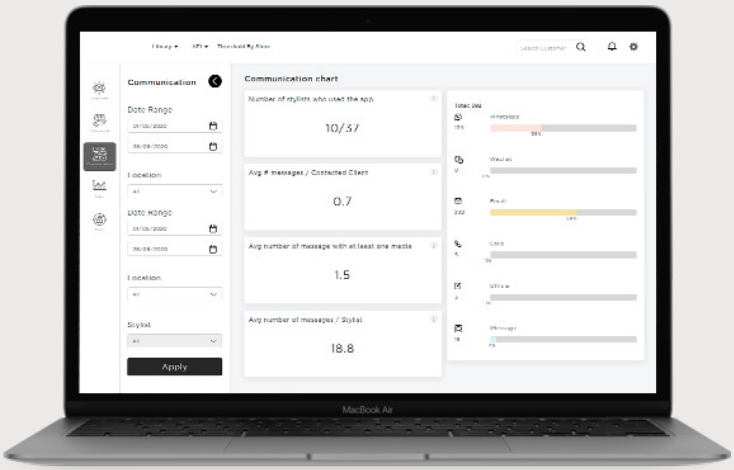
The record linkage solution built using Artificial Intelligence has proven to be time-efficient, has an incomparable accuracy level, and is self-learning. This ascertains that even if the size of the database increases in the coming days, the functionality of the solution won't be affected, which wouldn't have been the case with a static, rule-based algorithm built using NodeJS.

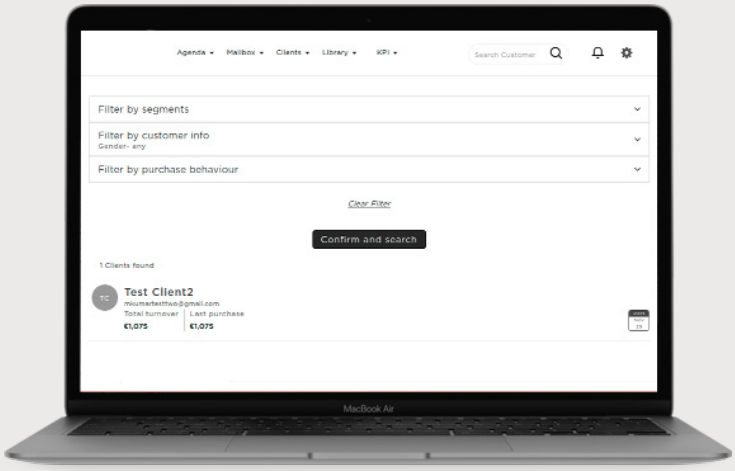
The Impact

The AI- based data management solution saved 80% of the time that it took to manually identify the duplicates and merge them. Compared to the static rule-based NodeJS solution, the AI-based solution offers a 98.8% improved accuracy rate as the AI models were trained with more than 30,000 records to ensure its accuracy.

Product Screenshots







About Daffodil

For more than 20 years, Daffodil Software has been a trusted software technology partner to organizations across the globe. We take pride in our ability to look beyond technologies & deliver innovative solutions.

Daffodil is a CMMI level 3 accredited organization with innovation, tech agility & process orientation rooted deep within the core. Our team of 1000+ technologists strive to shape the tech industry and help businesses elevate their value proposition through technology.

Technology Partnerships & Certifications

Microsoft Partner Silver Application Development partner	Google Cloud Premier Partner	aws partner network
Microsoft Partner Silver Collaboration and Content	UiPath Partner	PubNub
ISO 9001:2015	ISO 27001:2013	ISO 20000

Awards & Accolades

Deloitte. Technology Fast500 APAC Winner	IT EUROPA EUROPEAN IT & SOFTWARE EXCELLENCE AWARDS	zinnov ZONES	Great Place To Work. Certified INDIA
mobileweb award 2020	INDIA'S MOST ADMIRED BRAND 2020	CMMI level 3	The Economic Times BT BEST TECH BRANDS 2021

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