The client

This IT service provider specializes in IT modernization programmes, especially within the healthcare and government sectors.

Industry: IT services

Established: 2018

Headquarters: USA

Solution elements

RWS Technology Services: Software Engineering Services – emerging technologies

AI-powered conversational analysis gives digital transformation a boost

Even IT companies outsource to other IT providers, if they lack the resources or experience to meet a specific need. When this fast-growing IT service provider wanted to advance its AI offerings, it turned to the RWS Technology Services team for help.

RWS has been a development partner of this service provider for many years, helping to add a number of AI-powered capabilities to its customer offering. Most recently, RWS was asked to develop an application that could reliably extract software requirements from audio and video recordings.

How much is lost in conversation?

The customer was a government agency that the service provider was helping with its digital transformation plan. RWS had already helped with a chatbot application for this customer, using natural language processing (NLP) and machine learning (ML) to extract answers from software requirement documents to questions posed by the customer's developers.

But there was a gap in the capture of software requirements that the service provider felt could also be plugged with the help of NLP and ML. The development teams would often have conversations with stakeholders, which would cover important information or expectations relevant to their work, but this information wasn't reliably being documented. If these conversations were recorded (in audio or video format), AI-powered analysis could potentially be used to help extract the relevant information from the recordings, making it much easier to document all requirements properly.

RWS

AI-powered conversational analysis gives digital transformation a boost

Key business benefits

- Much more reliable capture of requirements, with much less effort for developers

- Time and cost savings (and greater productivity for new hires) from leveraging previous work

- Opportunities for further use cases through further ML development

Making the complex look easy

RWS was up to the challenge, delivering a web application that is so easy to use, it belies the complexity of the work that has gone into it. A browser-based user interface (UI) allows developers to upload an audio or video file and request a transcript, which is automatically delivered back to them with speakers clearly identified and visually separated. They can then do any or all of the following:

- **Identify the main topic** in a few words so that it's clear which business function and project the conversation relates to.

- **Generate a summary** of up to 250 words, designed to convey the essence of the conversation to decision-makers who don't have time to listen to or read the full conversation, and don't need all of the detail.

- **Identify the questions** in the conversation, to ensure that stakeholder queries and concerns are adequately addressed. This requires the identification of non-standard question formats, for example a question expressed as a statement, with perhaps only a conversational intonation indicating that it's a question.

- **Identify the action items** from the conversation, to ensure that nothing is forgotten.

- **Identify similarities** between the requirements expressed in the conversation and requirements captured in previous projects, saving developers a huge amount of time by enabling them to use previous work already done for similar requirements.

The delivery of this application took thorough research into existing AI tools, careful training of ML models, and a lot of development work to pull it all together into seamless workflows with a user-friendly front end.
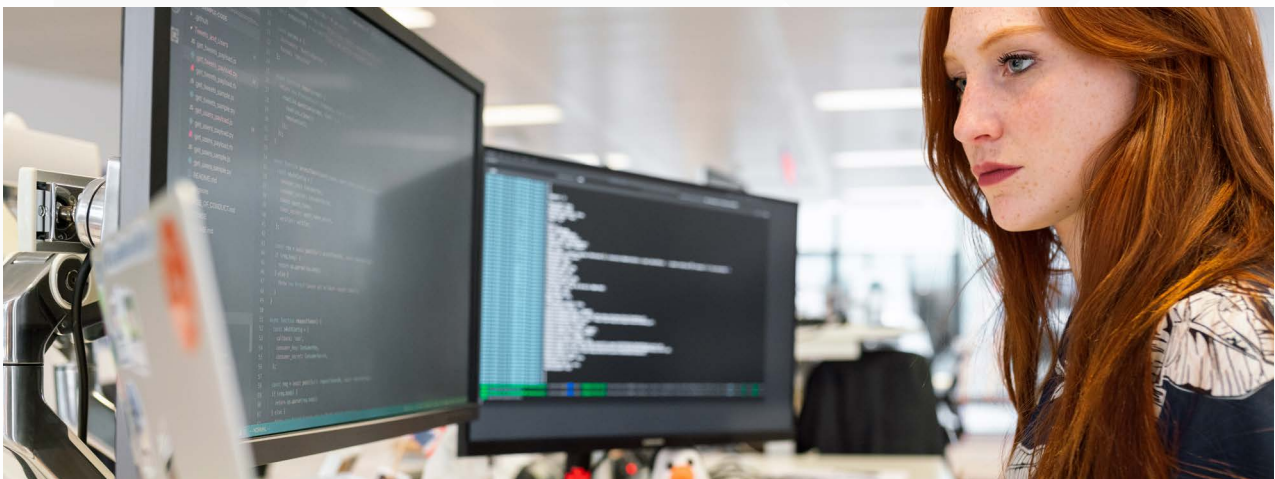
Technology stack used

- Angular web framework
- Django web framework
- TensorFlow ML library for Python
- Keras API for TensorFlow
- NumPy library for Python
- Pandas library for Python
- NLP/ML tools from Google, Gensim, Symbl.ai
- Apache Kafka platform
- Docker platform

Speech-to-text research

To determine the best third-party speech-to-text (STT) tool for the creation of transcripts from uploaded audio or video files, RWS thoroughly researched the market, including Amazon Transcribe, IBM Watson STT, Deepgram, and Mozilla DeepSpeech. Ultimately it was Google Cloud's Speech-to-Text API (along with its speaker diarization capabilities) that proved best for this application.

NLP and ML model research and training

To deliver solutions for topic identification, transcript summarization, and the extraction of questions, action items and similarities, RWS tested a variety of existing (pre-trained) AI models – often after training them with a more specific dataset created for the purpose. The application ultimately used:

- The Gensim open-source library for topic modelling

- Symbl.ai's Summary API, supplemented by development of an ML model for generating summaries

- A convolutional neural network (CNN) model for sentence classification, trained with a dataset of more than 200,000 sentences for the purpose of identifying conversational questions

Back-end and front-end development

Finally, RWS brought all of the components of the solution together into a working application, with a back end built using the Django web framework – known for the robustness of its REST APIs and its efficiencies in building complex database-driven sites – and a front end built using the Angular web framework, known for delivering great performance for users even for complex applications.

A big step forward in intelligent automation

This application is playing an important role in the continuing digital transformation efforts of the government agency for which it was developed. The automatic extraction of important information from conversations is a significant time-saver and risk-minimizer, since people no longer have to listen back to (or read) whole recordings of meetings or rely on their memories of what was covered. The identification of similar previous work saves time for everyone, but is particularly valuable when there are new developers who aren't even aware of previous work done.

AI-powered conversational analysis gives digital transformation a boost

There is also huge potential to develop additional ML models to extract new types of information, such as the relative importance of different requirements, or identifying when a new requirement conflicts with an earlier one for the same project, or automatically assigning a requirement to a relevant developer. There's no shortage of possibilities for further development of the application.

With training on different datasets, the application can also be adapted to extract relevant insights from different types of conversations, which could be used to improve all sorts of business processes, not just software development. RWS is already helping the service provider to present the possibilities to some of its other customers and potential customers, opening up opportunities to deliver more value and grow their business.

Learn more about how our AI services can help you

Contact us

About RWS

RWS Holdings plc is a unique, world-leading provider of technology-enabled language, content and intellectual property services. Through content transformation and multilingual data analysis, our unique combination of technology and cultural expertise helps our clients to grow by ensuring they are understood anywhere, in any language.

Our purpose is unlocking global understanding. By combining cultural understanding, client understanding and technical understanding, our services and technology assist our clients to acquire and retain customers, deliver engaging user experiences, maintain compliance and gain actionable insights into their data and content.

Our clients include 90 of the world's top 100 brands, the top 20 pharmaceutical companies and 19 of the top 20 patent filers. Our client base spans Europe, Asia Pacific, and North and South America. We work in the automotive, chemical, financial, legal, medical, pharmaceutical, technology and telecommunications sectors, which we serve from 80+ global locations across five continents.

Founded in 1958, RWS is headquartered in the UK and publicly listed on AIM, the London Stock Exchange regulated market (RWS.L).

For further information, please visit: **www.rws.com**