

PROBLEM

With limited information, identifying and isolating plane maintenance needs **could take hours**, even with an experienced crew

PROJECT

DeepNLP™ mined historical maintenance records to create a system that **prescribes optimal maintenance solutions**

RESULTS

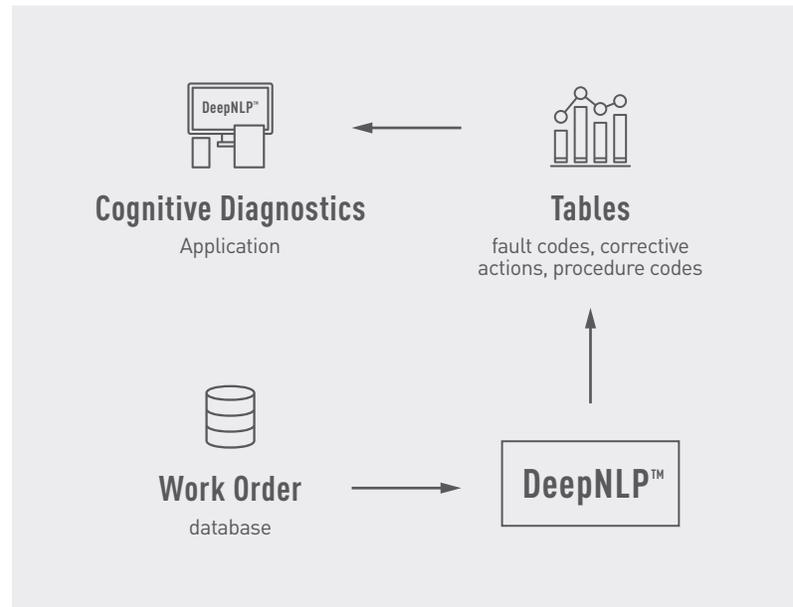
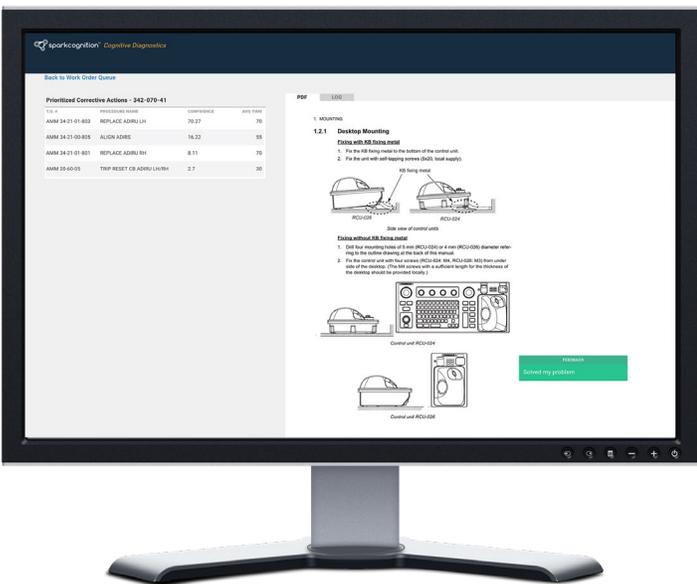
The DeepNLP™ solution will **drastically reduce maintenance** time and provide insights into the most successful maintenance strategies

The Problem

For commercial airlines, keeping flights running safely and on time is the highest priority. Even a one- or two-hour delay can cost between \$10K and \$150K per instance, not to mention damage to the airline's reputation. For military operations, keeping planes at peak mission-readiness at all times is equally crucial.

Despite the extensive sensor coverage in modern aircraft, air to ground communications systems can only record simple telegraphic information on any faults, along with anecdotal observations from the flight crew. Given the millions of parts that make up an aircraft, even experienced professionals can take several hours to identify and isolate the problem—which adds up to flight delays and dissatisfied customers. Often, this means removing multiple parts in the interest of time and sending them off for repairs only to find they are still working perfectly.

In addition, demand for trained personnel will outpace supply by 9% by 2027¹. The tribal knowledge from retiring technicians is often lost, with no efforts to capture it for future workers.

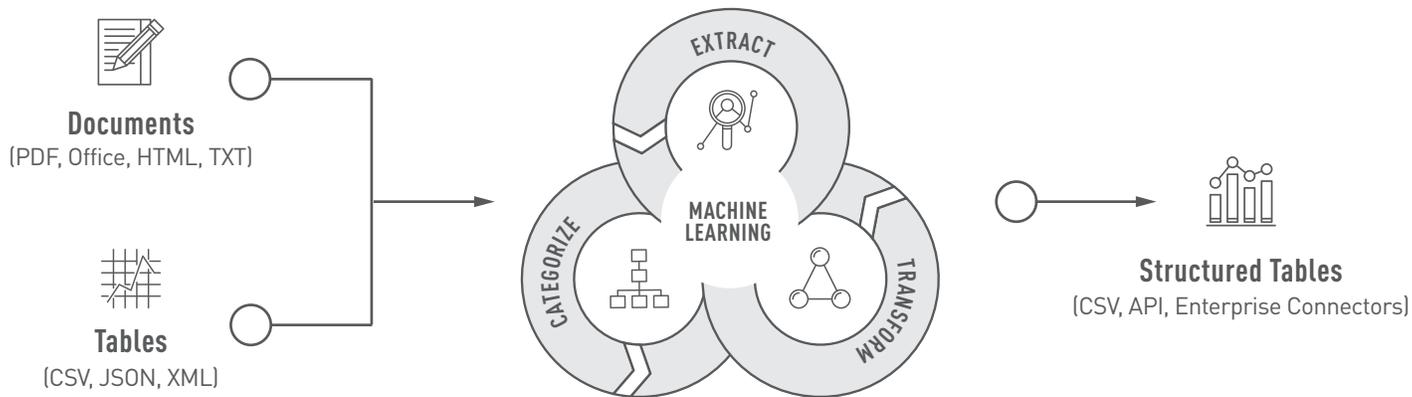


The Solution

A plane manufacturer was seeking a system to reduce time on maintenance incidents and capture tribal knowledge of veteran employees. The company contacted SparkCognition™ for a solution, which began the process of sorting through historical maintenance logs. The objective was to minimize scheduled downtime by supplying front-line maintainers with most effective corrective action procedures for fixing problems.

SparkCognition used its natural language processing platform DeepNLP™ to mine 120,000 work orders from 18 years to identify faults, successful corrective actions, and references to manuals that explain the proper procedures.

DeepNLP is a machine learning-powered NLP platform that automates the retrieval of information, classification of documents, and content analytics. Its core functionality is to pull from unstructured, natural language content, such as written documents or images, and transform the information contained in that content into structured data, such as tables or categories.



Results

After three months, the project was complete. SparkCognition was able to:

- *Normalize variability in natural language to identify maintenance actions*
- *Infer missing information from post-hoc and incomplete maintenance logs*
- *Identify a subset of records with clear actions that successfully resolved the problem*

How DeepNLP™ Works

DeepNLP enables organizations to automate workflows of unstructured natural language data through advanced NLP and machine learning techniques. It transforms natural language content into structured data, which can then be used for process automation, decision support and analytics, and predictive modeling when paired with automated model building software.

About SparkCognition™

SparkCognition builds leading artificial intelligence solutions to advance the most important interests of society. We help customers analyze complex data, empower decision making, and transform human and industrial productivity with award-winning machine learning technology and expert teams focused on defense, IIoT, and finance. For more information, visit www.sparkcognition.com

References

[1] <https://www.power-eng.com/articles/print/volume-115/issue-2/features/higher-availability-of-gas-turbine-combined-cycle.html>