CYIENT

ENABLING A CONNECTED FACTORY THROUGH FASTER EQN RESOLUTION FOR A LEADING ENGINE MANUFACTURER

Client: Aircrafts Engine Major

Client Location: Asia Pacific

Industry: Aerospace and Defense

Challenge: To optimize turnaround time and improve the accuracy of review method that analyzes deviations from the standard for a particular part, assembly, or associated materials

Cyient's Solution: By using a machine learning model we designed a customized platform that automates the review process of non-conforming components and delivers reports on most apt solutions for the EQNs raised

Summary of Results: Significant time reduction in the processing of EQNs with an accuracy of over 80% in the manufacturing and inspection process leading to faster time-to-market and decreased OPEX

Overview

While each component of an aircraft engine is designed according to certain parameters and standards, it is often only in the build (manufacturing or assembling) phase that the discrepancies in terms of its dimensions and/or kind of materials used are discovered. The non-conformance of a physical product with its quality leads to the raising of an engineering quality notification (EQN) to take appropriate remedial action.

The high number of these EQNs in the aircraft engine manufacturing process makes it difficult to apply corrective measures for the concerned components efficiently. Manually dealing with product nonconformity is a time-consuming process.

When Cyient was approached for a resolution to this issue, we designed a digital tool that enabled the client to electronically document, manage, and track non-conformance with materials, work-in-process or finished components. Our solution helped in more effective quality management and cross-functional communication between inventory control managers, manufacturing engineering managers, production control managers, and quality inspectors for streamlined product development.

Business Challenge

As a leading aircraft engine manufacturer, our client saw constant shipment delays attributed to production non-conformance. In this case, whenever an engine component failed to meet its precise design specifications or deviated from the acceptable tolerance range, the non-conformance was flagged, investigated, and resolved in a systematic but manual way as per quality management standards. The tolerance margins are very thin for safety aspects in the aerospace OEM industry which makes conformance more important.

The non-conformance was reported as an engineering quality notification (EQN). This was followed by engineering analysis, specialist approvals, reworks, change documentation, scrapping and communication—all of these involved significant time and manual efforts. They also came at a high cost while draining resources, affecting productivity, and consuming significant management bandwidth.

The number of EQNs raised in any manufacturing process usually runs into tens of thousands and finding the right resolution for them became a challenge for our client. They needed an optimized and automated system that identifies and manages quality non-conformance issues. Quick and accurate resolution for non-conformance was critical to their product integrity, brand reputation and accelerated shipment of the engines to their customers.

The Cyient Solution

For this project, we developed a solution using a machine learning algorithm that scans through the historical data of resolutions offered against earlier EQNs and identifies particular patterns in them. It then offers the quality management team with the top three or four resolutions that—on the basis of previous data—can be taken when a specific EQN arises.

The data sources that our system distills information from includes concessions data, plants data, maintenance logs, and repair actions. Our platform correlates the data sources with the components on which the EQN was noticed. It assigns an accuracy and conformance number to it to recommend to the user—in less than 2 seconds—the best resolution and conformance for the same.

To enable efficient decision making, it deals with non-conformance caused by over specifications, lack of manufacturability, deviation from customer needs' focus, and lack of maintainability.

The Results

With a digital platform for QN processing, the client got a robust recommendation engine for seamless and quick processing of high volume EQNs.

The platform automated and streamlined the steps involved in identifying, tagging, quarantining, and tracking the components that are moving through the plant but do not meet the appropriate specifications.

The solution helped the manufacturing engineers, plant managers, production planners, and shop floor operators take immediate decisions on what to do with non-conforming material or non-conforming components when there are alternatives such as:

- Rework
- Repair (through a design change)
- Re-grade for alternative use
- Scrap
- Redesign the product

THE MANUFACTURING AND INSPECTION PROCESS WAS OPTIMIZED WITH ACCURACY LEVELS OF MORE THAN 80%.

This digital tool designed by Cyient can provide the recommendation that an expert from the concerned domain would have normally suggested, and it takes significantly lesser time—just about 2 seconds—to take the decision. The OPEX involved in process improvements was also reduced by the new platform.

DESIGNING TOMORROW TOGETHER

For increased safety of aircraft engine products and optimized manufacturing process, it is important to avoid scrapping the parts that can be reworked, and identify the precise reasons for which a part needs rework. With the active participation of our client in the project, we gathered comprehensive data sets to make this solution successful. Scanning through structured data, it applies powerful analysis and statistics to populate the most suitable solution against non-conformance. This automation based digital solution by Cyient propels aircraft engine products into the markets quicker and with lower costs, while helping our client stay compliant with quality standards.

About Cyient

Cyient (Estd: 1991, NSE: CYIENT) provides engineering, manufacturing, geospatial, networks, and operations management services to global industry leaders. We leverage the power of digital technology and advanced analytics capabilities, along with domain knowledge and technical expertise, to solve complex business problems. As a Design, Build, and Maintain partner, we take solution ownership across the value chain to help our clients focus on their core, innovate, and stay ahead of the curve.

Relationships lie at the heart of how we work. With more than 15,000 employees in 22 countries, we partner with clients to operate as part of their extended team, in ways that best suit their organization's culture and requirements. Our industry focus spans aerospace and defense, medical, telecommunications, rail transportation, semiconductor, utilities, industrial, energy and natural resources.

For more information, please visit www.cyient.com

Contact Us

North America Headquarters
Cyient, Inc.
99 East River Drive
5th Floor
East Hartford, CT 06108
USA
T: +1 860 528 5430
F: +1 860 528 5873

Europe, Middle East, and Africa Headquarters
Cyient Europe Ltd.
The Space Holborn
235 High Holborn
London WC1V 7LE
UK
T: +44 20 7404 0640
F: +44 20 7404 0664

Asia Pacific Headquarters
Cyient Limited
Level 1, 350 Collins Street
Melbourne, Victoria, 3000
Australia
T: +61 3 8605 4815
F: +61 3 8601 1180

Global Headquarters
Cyient Limited
Plot No. 11
Software Units Layout
Infocity, Madhapur
Hyderabad - 500081
India
T: +91 40 6764 1000
F: +91 40 2311 0352

TRA_CS_EQN_OV_0119