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## SUCCESS STORIES

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### Engine Data Mining Software Provides New Capability for Air Force Engineers

#### — *ACHIEVEMENT* —

A software program will allow Air Force engineers, researchers and maintenance personnel to sort and search through fighter jet engine inspection data more efficiently. The design, known as the Intelligent Agent Architecture, was developed by the Materials and Manufacturing Directorate's Manufacturing Technology (ManTech) Division, in conjunction with researchers at ISTL, Inc. (formerly InfoScribe Technologies, Ltd.). This fully developed and demonstrated search capability allows users to log in to the newly implemented inspection database from any networked computer, run customized data mining agents through a web browser, and receive reports containing desired information.

#### — *PAYOFF* —

Shop managers can narrow their search for engine data, which will be as high as hundreds or thousands of gigabytes per year. Users can receive electronic reports within minutes, compared to the previous method of spending days sifting through hard copies of reports to find the information they need. Thus, initial estimates show that the data search and reporting methods will save hundreds of man-hours annually. Another benefit is the new capability of pulling information from data that was previously never recorded, such as the start and end times of the inspection process.

Additionally, the web-based system allows authorized users to access the data from any networked computer. Managers can define an inspection time interval, such as Monday through Friday, and obtain reports pertaining to that period. Users can receive reports on demand or have the software automatically forward updated reports periodically.

This new data mining capability also can provide relevant inspection reports ranging from which parts cause the most frequent inspection errors; to how long it takes for a specific engine part to be inspected.

#### — *BACKGROUND* —

Intelligent Agent Architecture originally was developed for use with data collected from the Eddy Current Inspection Stations (ECIS) under

ManTech's Engine Rotor Life Extension (ERLE) program. Under ERLE's data management activities, the inspection database collects and records all inspection data from the ECIS engine inspections. This includes part information, probe information, coordinates, inspection time, and raw inspection data. This sort and search method provides managers with a tool to quantify and analyze the efficiency of the 31 inspection stations at Oklahoma City Air Logistics Center, Tinker Air Force Base, Okla. To date, Intelligent Agent Architecture has detected an inspection deficiency on one engine part. It also has uncovered inconsistencies in the data collection process, such as blank data, missing data, and inverted data.

The Intelligent Agent Architecture search program allows for the integration of other data sources. For example, ECIS data may be integrated with the Retirement for Cause database that stores data associated with a flaw on an engine part. By integrating a part's flaw information with its coordinate data and incorporating a data visualization technique, the engine owners may create diagrams of parts with the locations of its flaws. Likewise, this data may be coupled with future data sources, such as engine usage data, to generate a detailed depiction of an engine's status or health. The Intelligent Agent Architecture will allow the integration of all data sources so users can search for trends ranging from the engine inspection processes to the engine's remaining life.

#### — **POINT OF CONTACT** —

If you would like further information regarding this Success Story, [please email our Technical Information and Support Center \(TISC\) at techinfo@afrl.af.mil](mailto:techinfo@afrl.af.mil), or call them at (937) 255-4689.

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