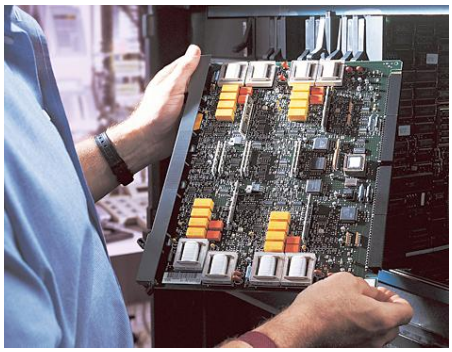
QSI
teamqsi.com

Testability
Engineering
And
Maintenance
System

An Advanced Health Management Solution for Test Equipment

When test equipment fails, production suffers and costs mount up. With Qualtech Systems, Inc.'s (QSI) Testability, Engineering, and Maintenance System (TEAMS), on-site technicians can do more to get the test machine up and running quickly. When a Field Service Engineer (FSE) is called on site, he or she brings along the troubleshooting expertise of the entire company on his or her TEAMS Remote Diagnostic Server laptop computer.



QSI's solutions simplify repair and maintenance of complex systems.

For service organizations, QSI's TEAMS system can

- **Increase the utilization of skilled Field Service Engineers (FSEs)**
- **Increase the number of calls handled by the service center**
- **Reduce the cost per call**

QSI's solution is based on a simple "failure space" model of the equipment. Based on engineering data, field maintenance data, and expert knowledge, the model provides a graphical representation of the system's failure modes and all the diagnostic and prognostic tests the system employs.

QSI has a wealth of experience building advanced health management solutions for high technology complex equipment manufacturers such as FEI Inc., Orbotech, Ltd. and others.

QSI's TEAMATE application translates results from diagnostics, automatic tests, and tests conducted by the technician into clear instructions on the action to be taken next.

Using this software, inexperienced technicians can perform at expert level.

The Methodology

QSI uses relationships and techniques that are compatible with FMEA (Failure Mode Effects Analysis) processes, testability engineering, R&M (Reliability, Maintainability) engineering, and Safety engineering.

While other approaches require intimate knowledge of system behavior, thorny algorithms to describe behavior, complex state diagrams, or networks of complicated relationships and numeric weights, QSI's qualitative system modeling approach allows the engineer to build hierarchical block diagrams, capture failure modes, capture functional failure manifestations, and capture testing information. From these inputs, the modeling tool can compute testability and diagnostic performance characteristics.

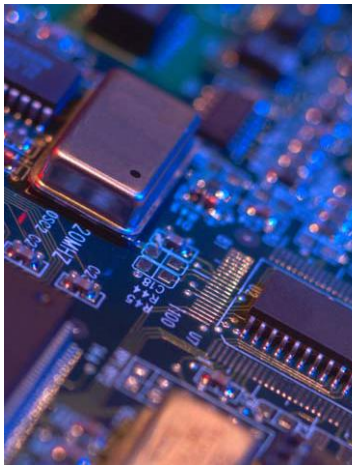
Applications based on the TEAMS model can be deployed quickly. Modeling complex, robotic imaging equipment for PCB inspection, for example, typically takes three man-months.

Putting Knowledge to Work in the Field

The TEAMS model makes field service engineers (FSEs) more productive. It performs an initial diagnosis from all observations (BIT, Fault Codes, and manual inspection), and then dynamically sequences the "next best test" to intelligently and interactively drive Interactive Electronic Technical Manuals (IETMs). Recommended procedures are generated step-by-step and "on-the-fly" based on:

- current symptoms
- relationships between failure modes, symptoms, and tests
- failure rate data
- time and cost of testing and repair
- resources on hand

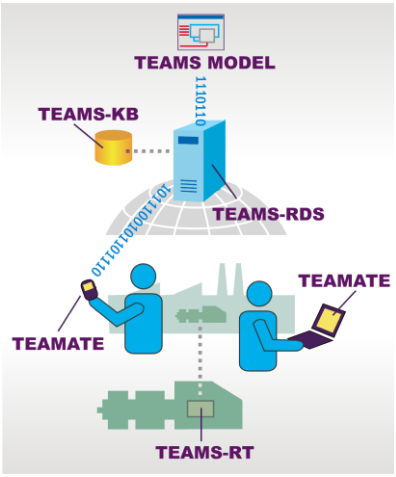
QSI's browser-based software runs on any PC-compatible computer device.



TEAMS-RT, QSI's real-time diagnostic reasoning engine can be embedded in the system hardware for onboard diagnostics.

On-board Diagnosis

TEAMS-RT, an ultra-fast, ultra-compact embedded "Reasoner" uses system information from the TEAMS model to perform diagnostics in real time and generate system health assessment continuously.



TEAMS-RDS used for remote troubleshooting and TEAMATE on a standalone portable computer used for onsite maintenance. Information on the standalone computer can be periodically synchronized with the server.

Remote Diagnostics and Telemaintenance

TEAMS-RDS is a network solution that can be easily deployed for use across your entire field service organization. With the system model deployed on one or more servers, tests can be conducted interactively, and clear accurate instructions dispatched to technicians around the world. This application has been shown to reduce travel costs and improve the speed and quality of field service, by reducing the number of false removals.

Knowledge Refinement Using Field Data

Data on the causes and consequences of system failures feeds continuously into the TEAMS-KB knowledge base. This data can be used to refine the system models, improve the management of spare parts, refine training programs, guide future design modifications, and measure the quality of service, components and suppliers.

About QSI

Founded in 1993, Qualtech Systems, Inc. (QSI) is a recognized leader in advanced diagnostics and health management software solutions. QSI has received awards from NASA (2002 & 2008 Space Act Award) and Aviation Week & Space Technology ("Technology Innovations 2002").

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