![QSI logo - teamqsi.com]

Testability
Engineering
And
Maintenance
System

An Advanced Health Management Solution for Telecommunications Systems

Field service operations in telecommunications must increasingly deal with disparate technologies, from legacy systems to voice/data convergence, with key network components coming from a wide array of vendors.

Telecommunications suppliers, OEMs, and aftermarket service specialists can deploy QSI's Testability, Engineering, and Maintenance System (TEAMS) to isolate faults faster, monitor entire systems, and speed troubleshooting and repair, even in remote locations.

QSI's solution is based on a simple "failure space" model of the equipment, and can incorporate information transmitted by the network's built in sensors and management tool. 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's solutions simplify repair and maintenance of complex systems – not only components such as switches and PBX equipment, but also entire network systems and subsystems.

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 has a wealth of experience building advanced health management solutions for high technology 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, in time frames measured in man-weeks or months, using practical knowledge that is available in your organization.

## 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.

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.
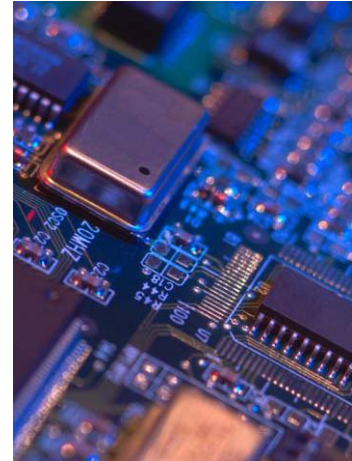
TEAMS-RT, QSI's real-time diagnostic reasoning engine can be embedded in the system hardware for onboard diagnostics.
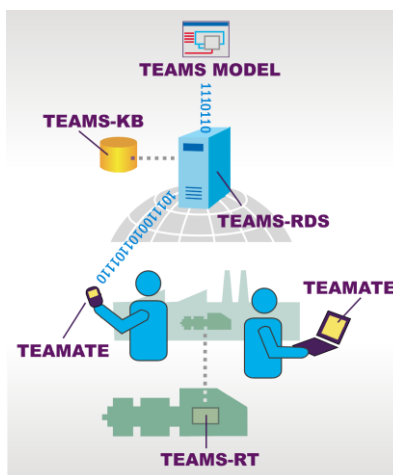
TEAMS-RDS used for remote troubleshooting and TEAMATE on a standalone portable computer used for onsite maintenance. Information on the standalone computer can be periodically synchronized with the server.

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").

United States
Qualtech Systems, Inc.
99 East River Drive
East Hartford,
Connecticut, 06108
Tel: (860) 257-8014
US Toll Free: (866)-934-8187
Fax: (860) 257-8312
info@teamqsi.com
www.teamqsi.com

China

Beijing Yeerich
Technologies Ltd.
Room 207, Building 6,
Western of YinLiNa,
Property Center,
North Zhanghua Road,
Haidian District,
Beijing, China 100097
Tel: 8610-88431792
Fax: 8610-88431762
info@yeerichtek.com
www.yeerichtek.com

Cinawind Co. Ltd.,
Room 310,
HengXing Building
89 Zhongguancun Dong Road
Haidian District,
Beijing, China 100190
Tel: 8610-62521452
Fax: 8610-62521457
info@cinawind.com
www.cinawind.com