Remote services

High tech means high service performance

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"Emerging technologies" is a term probably heard most often in the world of research and development, and is usually associated with new products. In general, such a term does not tend to appear in the same sentence with "after sales service and support."

Yet for companies like ABB with a huge client installed base, advances in technology are changing the way firms approach the subject of support. In addition, these same advances are directly helping clients improve their return on assets:

Operational profitability

With an installed base of more than $100 billion worth of automation products and systems worldwide, ABB is constantly working on ways to improve the way these systems are supported. Remote services use existing and cutting edge technologies to support field engineers, irrespective of location, in ways only dreamed of five years ago. The Internet, together with advances in communications and encryption techniques, has contributed enormously to this. Remote service developments are a direct result of clients' changing needs. ABB has been told clearly in almost every industry it serves, that it must continue to improve the return on assets of the systems it delivers. This does not mean customers want less support, but rather more support at lower costs. Remote services are designed to maximize knowledge bases in the most cost-effective manner. The result should ensure that the best knowledge is in the right place, at the right time, to support the clients' assets. With a large number of different types of products, this can be a complex undertaking.

Remote service benefits

A well-executed remote service offering can reduce unnecessary maintenance and downtime, improve production efficiency, track causes of failures, provide root cause data and fault diagnosis and recommend actions. It can provide predictive notification of impending failures allowing proactive instead of reactive corrective actions. Finally, it can allow remote specialists to apply their expertise to any factory in the world 24 hours per day, 7 days per week.

ABB's Remote Service business provides predictive and diagnostic capabilities serving all aspects of a plant – automation, equipment performance, equipment health, mechanics, electrification, electronics, and production to provide a complete solution.

Three levels of remote monitoring service are available to align with customer needs:

Remote troubleshooting

Remote troubleshooting provides expert on-demand, diagnostic remote support assistance in the event of a specific problem or failure. A demand-driven connection to the drive equipment is initiated to begin the troubleshooting process.
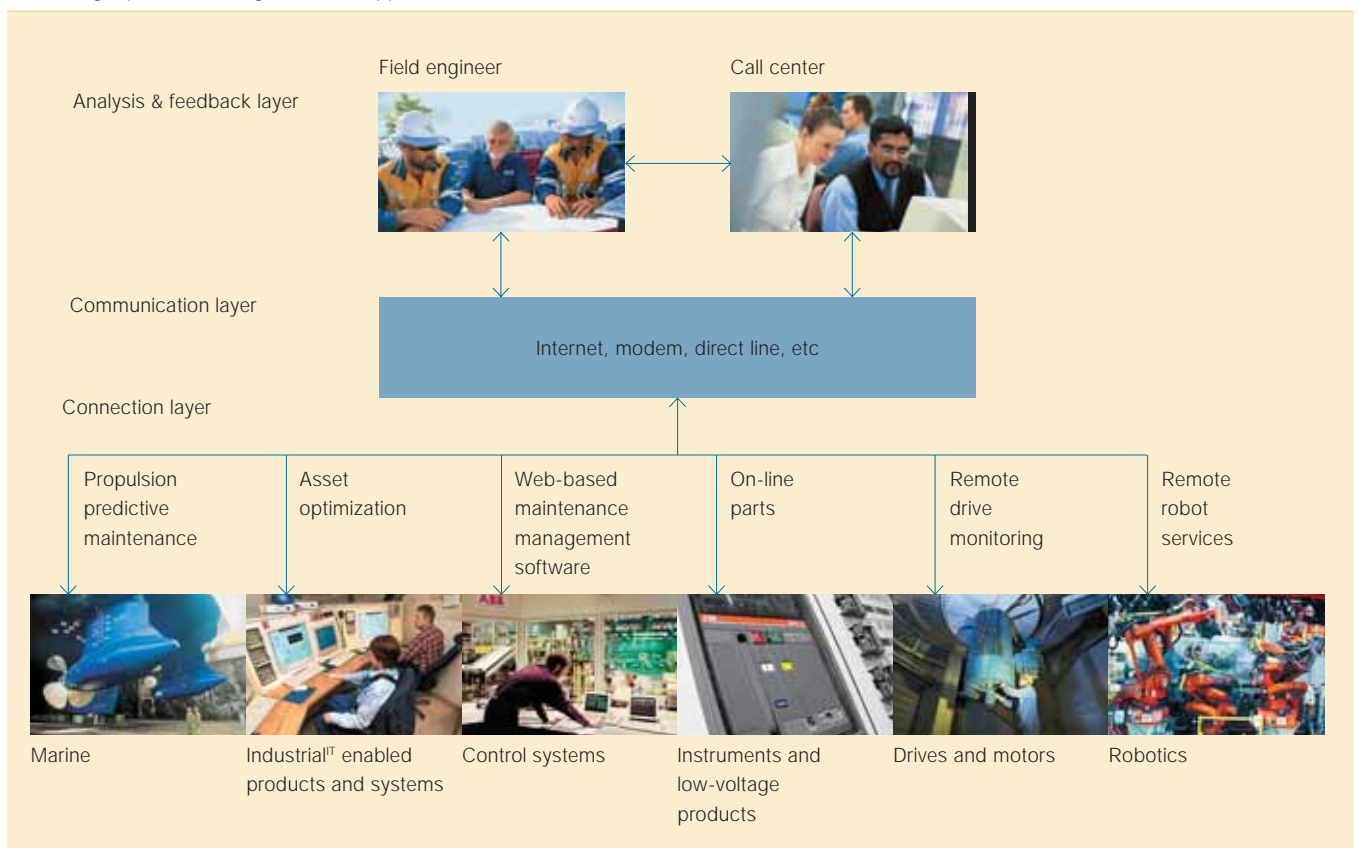
Periodic maintenance

Periodic maintenance provides a managed monitoring service for collection of equipment health information four times per year. Skilled support specialists provide expert data analysis based on established equipment benchmarks.

Continuous monitoring

Continuous monitoring provides continuous monitoring of key parameters. It automatically sends a message to an ABB monitoring center when parameters exceed limits. ABB specialists analyze the alarm and remotely access the device to further diagnose the issue. Corrective action recommendations are provided to the customer if required.

Remote services use existing and cutting-edge technologies to support on-site and field engineers, thereby ensuring the best knowledge is in the right place, at the right time to support the clients' assets.

Analysis & feedback layer	Field engineer	Call center

Communication layer

Internet, modem, direct line, etc

Connection layer

Propulsion predictive maintenance	Asset optimization	Web-based maintenance management software	On-line parts	Remote drive monitoring	Remote robot services
Marine	Industrial[IT] enabled products and systems	Control systems	Instruments and low-voltage products	Drives and motors	Robotics

Two types of alarms are generated:
- Predictive alarms: Device has not yet failed but key parameters indicate that a problem may occur.
- Reactive alarms: A problem has occurred and needs to be diagnosed.

Asset Optimizer as a key component

The Asset Optimizer, from ABB's Industrial[IT] product portfolio, takes remote services a step further. The asset monitoring software acquires and analyzes asset status and condition information. Powerful analysis algorithms developed from ABB's deep process and maintenance knowledge, provide predictive and proactive information and alarming functions. Once an alarm is generated, ABB's remote monitoring engineers are notified. In addition to the alarm, the Asset Optimizer also provides important data related to the issue for ABB's remote expert to analyze and determines the root cause of the problem. On-site operators and maintenance personnel can also be notified when an abnormal condition has occurred that requires some form of maintenance action.

Advances in technology are changing the way firms approach the support of installed equipment, as well as helping clients improve their return on assets.

In addition, the Asset Optimizer can be directly linked to most computerized maintenance management software systems for automatic work order generation. This feature provides a powerful, integrated solution connecting site management, operations, maintenance, and ABB's remote service engineers allowing seamless communication and fast, efficient actions.

Remote services at work

The following examples illustrate how remote services in use today are giving customers more value at less cost:

Remote paper plant support

ABB provides remote services to a North American paper manufacturer that produces high performance linerboard. The remote service includes monitoring Control Loop and Quality Control System (QCS) performance. ABB's QCS solution is designed specifically for the pulp and paper industry and is designed to measure and control the weight, moisture and caliper (thickness) of the linerboard.

The remote service provides monitoring of the health of QCS System's scanners and sensors, the PID control loops, as well as the quality of the product. If potential problems are indicated (by monitor "trips"), ABB's remote monitoring center is alerted. These alarms often occur before a failure has even taken place.

The remote service has provided significant value to this customer. The remote monitors recently sensed abnormal changes in a device that was not scheduled for immediate maintenance. The device was replaced during a scheduled production stop. When the process came back up, all signals were normal. This paper plant was able to save approximately ten hours of unscheduled downtime by predicting when the device was about to fail, and changing it at the most cost-effective time – before an unplanned stoppage costing tens of thousands of dollars in losses could occur.

Remote robot support

When an issue arises concerning an installed robot, the on-site plant engineer calls ABB's global robotic expert center. The plant engineer then creates a direct link between the center and the installed equipment, but only after ensuring all local safety requirements are in place. Off-site experts review the equipment, diagnose the problem and either take direct action or provide instructions to the site engineer, who can then solve the problem.

The robot can also diagnose the problem itself, and then call ABB's global Robotic Expert Center for support. However, this raises safety concerns at the site. A balanced compromise is

reached with a combination of automatic and manual processes.

Remote power utility support

A major power utility producer in the United States recently experienced an issue that was preventing a startup. Using their support line subscription, they called ABB for technical support late on a Friday night. The caller feared he would not get results at that hour, and when he was told someone would return his call shortly, he felt certain his fears would be realized.

ABB holds the view that technology for technology's sake is not always the best solution.

Imagine his delight when an ABB Service Engineer (SE) returned his call within 30 minutes. The SE immediately proceeded to solve the problem. There was no waiting until the next business day – no waiting for an engineer to fly to the site!

This ABB customer had been resetting several modules. One had continued to report an error. By utilizing continuous monitoring, the service engineer determined that the module had to be reloaded, which he did remotely.

The service engineer utilized ABB's Remote Diagnostic Services (RDS) technology to optimize the power utility producer's assets in real-time.

The module was successfully reset. Delays and uncontrolled maintenance costs were avoided, while the startup stayed on schedule.

Remote condition monitoring

ABB holds the view that technology for technology's sake is not always the best solution. When it comes to vibration analysis in condition monitoring, for example, the company balances its services to provide a cost-effective, tiered approach. This means that an appropriate technical solution is determined based on the consequences of the asset failing and/or its cost. In the following, the case is considered of a simple low-cost motor in a non-critical application that is best supported

when data is gathered manually. Vibration data is collected using small hand-held devices. This data is then loaded onto a PC where a software application "decides" whether the vibration data is within specification. If not, the system will automatically upload the data to global ABB condition monitoring experts where another more in-depth software application screens it for recommendations. It then passes the final data and pre-analysis to dedicated vibration experts. A final review is done, and recommendations or work orders are sent back to the local site. In general, the level of automation for this process is based on asset costs versus human intervention costs at the client's site. The systems for high-cost critical assets automatically and continuously monitor vibration data and provide specific analysis and work intervention 24 hours a day.

Remote power plant support
Kentucky's primary energy services provider is Western Kentucky Energy, or WKE. In a recent pilot program, WKE's Green Station in Sebree, Kentucky, (USA), utilized asset optimization to provide diagnostic service for their Harmony process control system (Harmony Continuous Monitoring). Asset monitors installed on-site sent critical asset data to the ABB monitoring center around the clock.

Remote diagnostics recently detected a failed backup communication mod-

ule before it became a costly issue. Had the primary communication module failed, the redundant module would have been unavailable and production would have ceased.

ABB must continue to improve the return on assets of the systems it delivers. This doesn't mean customers want less support, but rather more support at lower cost.

Instead, WKE was notified in a timely manner, was able to schedule maintenance on the failed redundant unit during routine maintenance, and a costly stoppage was avoided completely. Production capacity was ensured and maintenance costs kept low through remote continuous monitoring.

Remote site asset monitoring enables optimized control system performance through continuous retrieval and evaluation of system performance indicators against established norms. If there are on-going issues, remote diagnostics will catch them. Coupled with automated incident reporting, remote monitoring provides reduced maintenance cost, enhanced production

quality, improved maintenance planning, and increased uptime.

Conclusion
ABB's Remote Service business provides predictive and diagnostic capabilities serving all aspects of a plant – automation, equipment performance, equipment health, mechanics, electrification, electronics, production, and quality to provide a complete solution for our clients' needs.

The primary benefits of Remote Services are that they increase asset availability and improve production efficiency. In addition, they maximize operations and maintenance effectiveness.

Remote Services can greatly contribute to the operational excellence and financial performance of a customer plant. The combination of powerful predictive and diagnostic analysis along with experts available 24 hours per day, 7 days per week can provide a highly effective means to remain competitive in the marketplace.

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