



Engineering Firm Uses Radio Frequency Identification (RFID) to Automate Inspections

Overview

Country or Region: Canada

Industry: Professional services

Customer Profile

Based in Peterhead, Scotland, Score Group plc provides valve and gas turbine solutions for global companies in many industries. In 2007, the company earned £150 million (U.S.\$220 million) in revenue.

Business Situation

Employees used a paper-based process to access and record information about valve inspections. Along with slowing inspection times, the process required manual data entry and impeded data sharing.

Solution

Score Group engaged IDBLUE to deploy a radio frequency identification (RFID) solution with Microsoft® BizTalk® RFID Mobile that automates the process used to record inspection data.

Benefits

- Accelerated valve inspections by 5 to 15 percent
- Increased accuracy
- Boosted efficiency in the office
- Provided for scalability and flexibility

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Andrew Stephen, Works Manager, Score Group plc

Score Group plc wanted to streamline a paper-based process that employees use to track valve-inspection information. The solution needed to be portable and easy to use by both employees in warehouses and personnel in rugged, offshore environments. The company addressed its challenges by using a radio frequency identification (RFID) solution built with Microsoft® BizTalk® RFID Mobile and Windows Mobile® devices. Microsoft Gold Certified Partner IDBLUE helped to design and deploy the solution in just three months. The new automated system has reduced valve-inspection times and helped to improve employee productivity in the office—both by 5 to 15 percent. In addition, the solution promotes greater levels of data accuracy and is flexible and scalable so that Score Group can adapt it to support additional corporate locations and to provide for automated billing.



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Situation

Score Group plc supplies and maintains industrial equipment for governments and global corporations in industries such as oil, gas, defense, and aerospace. Headquartered in Peterhead, Scotland, the company's nine subsidiaries employ more than 1,400 people at 234 locations on six continents.

Maintenance personnel install, monitor, and service equipment such as valves, actuators, and gas turbines to help customers to maximize the safety and reliability of equipment and to comply with industry regulations. In 2007, Score Group sold £150 million (U.S.\$220 million) in products and services.

Before 2008, Score Group sought a way to accelerate valve inspections at its subsidiary, Score (Eastern Canada) Limited in Saint John's, Newfoundland. Employees in St. John's regularly inspect thousands of valves for large oil and gas companies either at offshore locations or at a Score Group maintenance facility. Before conducting an inspection, an employee must locate the valve's unique identification (ID) number, which is machine-etched into the part. This can be challenging due to dirt or environmental conditions. The employee must then go back to the office, or call another employee there, to find the file that contains the valve's service history. “When the time came to service or inspect a valve, our employees had to consult a paper file that was normally larger than the size of the item itself,” explains Andrew Stephens, Works Manager at Score (Eastern Canada) Limited.

After locating the paperwork or obtaining the necessary information by phone, the employee can begin the actual valve inspection. After the inspection, the employee records pertinent information on a paper form. Later, the employee gives the form to a quality inspector or controller at the office who manually enters the information into a

stand-alone custom application with limited integration capabilities and network connectivity. As a result, employees must print valve-inspection information to share it with customers or with other departments such as finance. In addition, employees must manually reenter valve-inspection information into multiple systems.

In January 2008, Score Group became interested in how it could use radio frequency identification (RFID) technology to simplify operations. Rather than relying on handwritten information, the company could apply an RFID tag to every valve. The tag would contain the part's unique information and service history. Not only would the tag be durable enough to last the lifetime of the part, but the tag could also be used in an electronic process that would facilitate the exchange of valve information between employees, managers, subsidiaries, and even customers.

Following a recommendation from contacts at Memorial University in Saint John's, Score Group contacted Microsoft® Gold Certified Partner IDBLUE about an RFID solution. It would need to be cost-effective, scalable, and flexible enough to interoperate with existing systems—and would need to support mobile workers in variable environmental conditions. Drawing on its expertise in maintenance, repair, and overhaul (MRO) asset management systems, IDBLUE proposed an automated inspection solution built on Microsoft BizTalk® RFID Mobile. Commenting on the Microsoft technology, Steve Taylor, Chief Executive Officer of IDBLUE, says, “BizTalk RFID Mobile solutions are on the cutting edge of the RFID industry. The product enables powerful, dynamic, mobile RFID solutions while providing numerous options for integrating with existing IT technologies.”

After careful consideration, Score Group engaged IDBLUE. “We chose IDBLUE based

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on its end-to-end asset management and MRO solution offering built on BizTalk RFID Mobile,” says Andrew Stephen, Works

Solution

Score Group decided to deploy its automated inspection solution in several phases. Initially, three workers in St. John’s would use the solution on a single-valve model that is serviced onshore at a Score Group maintenance and distribution facility.

In June 2008, two consultants from IDBLUE worked with four employees at Score Group to assess business processes and to design the solution. The design included a portable RFID reader from IDBLUE, which resembles a thick pen, along with a compact Windows Mobile® device running the Windows Mobile 6 operating system. Score Group maintenance personnel use the IDBlue HF reader to access and write information to RFID tags on the valves. BizTalk RFID Mobile runs on the Windows Mobile device and the Bluetooth wireless protocol runs on both the reader and the Windows Mobile device. These technologies exchange information between the devices and the RFID tags. When a maintenance worker scans a tag with the IDBlue reader, the valve’s service history is transferred from the tag to the Windows Mobile device and is displayed in an application developed by IDBLUE using the Microsoft .NET Compact Framework. The electronic inspection record includes all of the fields from the paper forms, including the valve’s ID number, make, model, date of last service, and the name of the employee who last inspected it. After the inspection is complete, the employee can modify the valve’s inspection record as necessary using the Windows Mobile device. When the worker saves the file, the application automatically adds the time and date to the form. The Windows Mobile device then sends the file back to IDBlue, which stores it on the RFID tag.

Microsoft SQL Server® 2008 Compact version 3.5 data management software also runs on the Windows Mobile device so that the valve’s service record is automatically recorded when the maintenance worker saves the file. When the employee returns to the office, the databases on each of the mobile devices are automatically synchronized to reflect any changes to valve information.

Score Group and IDBLUE tested and deployed the solution in September 2008. By the end of the month, the first phase of the solution went live. The company issued Windows Mobile devices and IDBlue HF readers to three employees. Working at the office, the employees attached RFID tags to approximately 75 valves. Next, they used the Windows Mobile device and IDBlue HF readers to manually record the valves’ service histories on the tags and on the databases on the Windows Mobile devices. The process—which included applying the tag and recording valve data—took about two to four minutes per valve.

Today, employees have tagged approximately 100 valves within the maintenance facility. Over the next year, Score Group will continue to roll out the RFID solution so that maintenance workers in Eastern Canada can use it to access and record information about all of the valves that they service—onshore and offshore. In addition, the company will use Microsoft BizTalk Server 2006 to create workflow processes to automatically exchange valve-inspection information with systems in the office and with customer systems.

Benefits

The automated RFID inspection solution helps employees at Score Group plc to conduct inspections dramatically faster than before. It also minimizes the risk of data errors and boosts the productivity of office

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personnel. In addition, the company can easily update the solution to support additional parts, subsidiaries, and workflow processes.

Accelerated Valve Inspections by 5 to 15 Percent

The employees that use the new solution can inspect valves much faster than in the past. They no longer have to spend time locating the ID number that is etched into the valve, or pulling the associated service history from a file cabinet. A simple scan with an IDBlue HF reader instantly sends the valve's information to the worker's Windows Mobile device and then back to corporate systems.

“Our maintenance and quality control personnel find that the solution built on BizTalk RFID Mobile has accelerated inspections by 5 to 15 percent,” says Stephen. “Employees no longer have to search for paper records or make phone calls back to the office to have someone else find the record. Instead, they can instantly retrieve and update data in the field. In addition, IDBlue's unique form factor makes it ideal for use in our mobile inspection environment. And, unlike most RFID readers, IDBlue HF is small enough to fit into an employee's pocket. The pairing of IDBlue HF with the Windows Mobile device for data collection delivers a truly mobile, easy-to-use application.”

Increased Accuracy

The new automated process leaves less room for human error—especially by workers in the field. An RFID tag cannot be misread, and the automated system ensures that the appropriate service record is used in an inspection. As a result, Score Group can be sure that valves are serviced at appropriate times and that the service histories of customers' valves are complete and accurate. This helps Score Group to more efficiently comply with industry regulations

and to maximize the uptime of the systems that the valves support. “The solution provides user-friendly, easily accessible reports based on operational data that we are able to present to regulators,” says Stephen.

Although it was not part of the initial project goal, RFID has helped to streamline inventory processes. With a Windows Mobile device, employees can quickly locate a particular valve. In addition, employees can use the new system to instantly identify what inventory is in stock.

Boosted Efficiency in the Office

When valve information is captured electronically, manual data entry can be greatly reduced. “Because BizTalk RFID Mobile can easily share information with existing IT technologies, employees will no longer have to enter data about valves into multiple systems,” says Stephen. By eliminating the delays that manual data entry creates, managers can also be assured that the information on which they base decisions is up to date and consistent between devices.

In addition, employee productivity in the office has increased by 5 to 15 percent. SQL Server offers built-in reporting tools that can be used to automatically generate reports that detail valve locations and lifecycles so that managers do not have to manually collect data. From the dashboard on a Windows Mobile device, employees can generate operational performance reports that detail the number of valves inspected during a specific period of time. Employees can also quickly create financial and efficiency reports.

Provided for Scalability and Flexibility

Score Group can easily modify its automated inspection solution to meet the varied business requirements of subsidiaries today and into the future. The application built on

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the .NET Compact Framework can be configured to incorporate additional forms, fields, and processes. In addition, BizTalk Server 2006 offers numerous adaptors that automatically connect to disparate IT solutions used within the company and by third parties. Score Group plans to take advantage of this flexibility to develop innovative services for its employees, suppliers, and customers.

For example, Score Group wants to integrate the new solution with systems used by billing so that once an inspection is complete, an invoice is automatically generated and sent to customer systems using electronic data interchange. In addition, valve-inspection information can be shared with purchasing systems so that order requests are automatically generated when a replacement part is required. Another goal is to integrate the new system with the company's logistics application so that employees can immediately see which valves have shipped to or from oil production sites.

Microsoft Server Product Portfolio

For more information about the Microsoft server product portfolio, go to: www.microsoft.com/servers/default.aspx

Software and Services

- Microsoft Server Product Portfolio
 - Microsoft BizTalk RFID Mobile
 - Microsoft SQL Server 2008 Compact version 3.5
- Windows Mobile 6
- Technologies
 - Microsoft .NET Compact Framework

Hardware

- IDBlue's HF RFID reader
- Windows Mobile devices

Partner

- IDBLUE