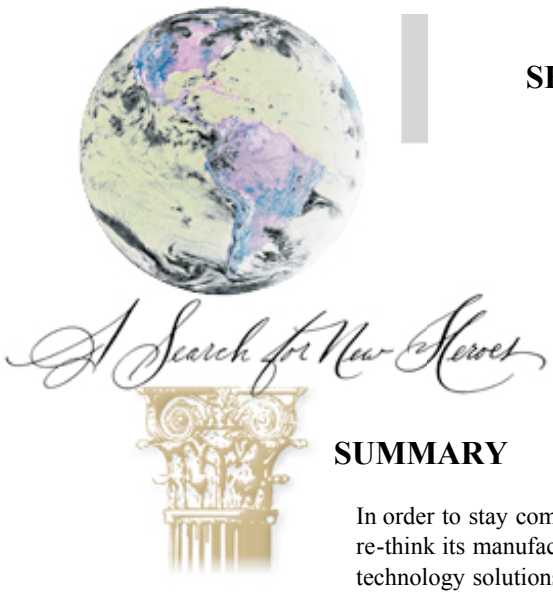

Robert Carrigan,
Chairmen of the Chairmen's Committee

Ron Milton,
Vice-Chairman of the Chairmen's Committee

Dan Morrow,
Chief Historian

SHOP FLOOR MONITORING SYSTEM (FACTORYMRI)

2005 COMPUTERWORLD HONORS CASE STUDY

MANUFACTURING

IN LESS THAN NINE MONTHS A MANUFACTURING COMPANY IMPLEMENTED NEW TECHNOLOGY SOLUTIONS, INCREASING MANUFACTURING CAPACITY BY SEVEN PERCENT AND LABOR EFFICIENCIES BY AN ESTIMATED 15 PERCENT, ALL WHILE REDUCING ANNUAL SETUP COSTS BY $130,000 AND DEFECTS BY 50 PERCENT. **[20055392]**

SUMMARY

In order to stay competitive with offshore manufacturers, Premier Manufacturing Corporation had to quickly re-think its manufacturing processes. In less than nine months, the company creatively implemented technology solutions tied to management and workforce initiatives that allowed Premier to increase manufacturing capacity by seven percent, boost labor efficiencies by an estimated 15 percent, reduce annual setup costs by $130,000, reduce defects by 50 percent, improve first-pass yields by ten percent, and improve customer service.

APPLICATION

Premier Manufacturing Corporation is the leading original equipment manufacturer supplier of fabricated wire products for the heating, ventilating and air conditioning industry. The company selected infrastructure and development tools from Progress Software to develop, deploy, integrate and manage critical business applications. We sought to capture detailed information on production to improve operational performance, enhance workforce utilization and analyze the production process to enable continuous improvement.

Management had recognized the need for clearer insights into production operations. Previously, employees filled out production cards, which administrative personnel then keyed into systems. Management then reviewed this information to try to understand equipment utilization, setup time, labor productivity and production efficiency.

We were making business decisions based on limited information, and we wanted to improve our visibility into what was really happening on the shop floor. We figured out we were spending nearly $3,000 a week just handling the cards—which were only providing us with minimal actionable information—and we realized the need to develop better ways to gather information on production operations.

For example, if management wanted to analyze the idle time of the machines, an analyst would need to capture the data from the time cards and build a matrix to manually compare the utilization of each machine. Gaining valuable insights into operations was a time-consuming process, and executives lacked the ability to swiftly drill into information to identify and correct inefficiencies. Management saw flexible access to information as a business imperative for maintaining the company's advantage in the market.

The manufacturing industry in America faces stiff competition from overseas manufacturers, so we have to work harder at getting smarter to make ourselves more competitive. We view information as a means of capturing a competitive advantage that can help us reduce costs, better serve our customers, and maintain a healthier business.

Premier wanted to capture data on activities throughout the production cycle, and evaluated various methods of data collection and analysis. We searched for an off-the-shelf solution, but could find none that met the company's demanding requirements.

As we were evaluating alternatives, we realized that operator control station panels that were originally designed for controlling machinery could be converted into data collection systems. These panels attach to production machinery and have keypads so that operators can also enter or view information. We adapted these hardened devices and wired them to production machines to capture the necessary information on everything ranging from production output to temperatures to pressures and voltages.

Shop floor personnel could therefore focus their time on operations without the distraction of manually filling

out time cards. Once the information was captured, it needed to be stored in a flexible repository, and we needed powerful tools that could extract and massage the data to provide insightful and meaningful management information so we selected IT infrastructure based on Progress Open-Edge technology.

Our infrastructure now polls these devices and constantly collects data in real time. We developed and deployed this application within just nine months, and this innovative technology solution now provides the around-the-clock reliability that supports two plants that run three shifts a day, seven days a week throughout most of the year.

BENEFITS

This project has helped management gain insights needed to improve business operations, and it has helped employees increase their productivity. It allows Premier to improve our ability to compete against offshore manufacturers, and it helps us maintain jobs and contribute to communities in Ohio and Tennessee where our plants are located.

The ability to generate customized reports has allowed Premier executives to gain valuable insights into operations. For example, we have reduced setup time for new production runs because management can now more accurately predict completion times.

By knowing when a job will be completed, we are able to improve productivity and reduce setup time. In the past we were never sure on which shift a job would finish because we lacked hard data. Now we can very accurately predict completion times, and managers know when setup personnel are needed so transitions are smooth and efficient. This initiative allowed us to take advantage of attrition to reduce two setup positions, saving over $130,000 annually in labor costs.

The ability to create flexible reports has provided many other major advantages. For example, we estimate that Premier has increased manufacturing capacity by seven percent through this automation project. The reporting has also resulted in an estimated fifteen percent increase in labor efficiency.

The adoption of the system also helped improve productivity by leveraging the company's incentive pay system. The reporting on productivity is used as a motivator so that employees can drive themselves to be as productive as possible. We are able to look very carefully at idle times and use that information to explain to employees how they can make more money by reducing idle time and increasing their productivity. For example, an employee reviewing a productivity report may realize that by eliminating a few minutes of downtime per shift he or she would earn a higher hourly wage.

Because the system captures extensive volumes of real-time data, we are now able to extract and analyze information stored in the Open-Edge repository to tailor reports to address virtually any aspect of our manufacturing process.

One major area of improvement is quality assurance. We estimate that automation has helped the company reduce defects by as much as fifty percent. The company has also leveraged information to improve its ability to get the job done right the first time. We estimate a ten percent improvement in first-past yield.

Customers also benefit from more detailed information on product status and more accurate estimates of product delivery dates. Our customer service department can look at the status of a job through an easy-to-use Web interface. If a customer calls and wants early delivery, our customer service rep can drill down into the production floor status to see whether this is even possible. We are able to provide our customers with greater visibility into production so that we can become a more valuable supplier to them.

IMPORTANCE

The ability to capture massive volumes of real-time production information has fundamentally changed how we produce our products. We have the ability to immediately create custom reports that leverage shop floor data to help managers improve operations.

By creating a centralized repository of real-time production information—and by implementing the development tools that allow us to massage the data to create meaningful reports—we understand our business much better and management can make more informed decisions.

Despite the fact that IT is now generating a great many highly customized reports on production, we have implemented this technology solution without requiring any additional IT headcount. We run the database

without the need for a database administrator, and the IT function has become even more important to the business because this initiative allows management to truly understand operations and continuously improve production, quality assurance and customer service through the use of information technology.

ORIGINALITY

While most other companies would deploy ruggedized PCs to the shop floor, we were sensitive to the need to avoid burdening workers with tasks that did not directly contribute to production results. We briefly considered installing ruggedized PC workstations on the shop floor to collect data, but concluded that this traditional solution would merely shift the work to the production floor. It would force production workers to enter data, which is something they may not be good at or that they may not like to do. Instead, we wanted to be able to automatically capture information directly from our machinery that would support flexible statistical analysis of our production environment.

There was no networked production management equipment on the market capable of addressing our data collection needs, but we refused to accept this limitation. We continued to investigate alternative data collection technologies until we found operator control station panels that were originally designed for controlling machinery. We realized that if we created a sophisticated database and deployed powerful and flexible development tools, we could use these operator control station panels creatively to collect valuable information. Even the manufacturer of the panels never envisioned this type of application.

We accepted no obstacles. We even wrote highly customized software drivers so we could collect detailed information from panels that were designed for production control.

The technology also enabled a creative partnership between management and labor in support of the unified goals of ensuring a healthy business on an ongoing basis and protecting jobs. The workforce has already embraced the new technology. The reporting system has become accepted from a cultural standpoint because shop floor workers get more immediate and measurable feedback on their performance. This feedback is complemented by incentive-based pay, leading to a healthy, “video game” perspective. Workers realize that if they achieve a high score there will be an immediate reward reflected in their paychecks.

SUCCESS

Within just nine months, Premier improved production efficiency, reduced setup times, increased production capacity and improved customer service. This technology initiative fundamentally changed the way we produce our products, and has allowed us to continue our business success while remaining an important member of the local business communities in Ohio and Tennessee.

Management now rightfully expects to review the production information necessary for executives to make informed decisions. We are running production based on hard facts and continuously pushing the envelope to capture and present the information necessary to support continuous improvement of our business. The workforce now views the technology as an aid to help them make more money, rather than as a threat to their jobs.

The project has been so successful in such a short period of time that we are now planning to extend the program. We are now deploying the Sonic Enterprise Server Bus (ESB) to integrate the shop floor statistical information in our OpenEdge repository with our existing manufacturing resource planning and enterprise resource planning applications. We are also planning to further extend our data collection abilities by adding support for handheld devices, and we plan to use bar coding technology for serial/lot tracking to improve traceability.

The Open-Edge databases and tools give Premier a competitive advantage because they allow us to continuously improve production, and they provide management with flexible access to the information needed to improve operations.

DIFFICULTY

While the executive team understood early that we needed to implement new systems to provide the information needed to improve our production process, obtaining buy-in from the workforce was a major challenge.

It took awhile for shop floor workers to understand and accept what we were doing. But they now understand that we are providing the information they needed to better succeed at their jobs and improve their earning

potential. They also know that the company is maintaining its competitiveness in our market, thus helping to secure their ongoing employment.

It was also difficult to select the right technology—particularly since our initial search yielded no data collection solutions that could meet our goals. But we overcame this challenge by expanding our search and leveraging operator control station panels that were never designed for production monitoring to capture a tremendous amount of real-time information.

We overcame both technical obstacles and cultural resistance because we realized the importance of the initiative as a means to protect the long-term viability of our business. And it was all worth it, since the system is now ingrained in the culture, the technology works great and we are already expanding upon our technology solution as we continuously improve our business.