Executive Summary

Manufacturers are constantly looking for ways to streamline processes, and accurately determine and monitor the actual labor costs to produce their products. Failure to do so can result in lost profits, lost productivity and give their competition a competitive advantage.

This white paper describes typical challenges, experienced by most manufacturers, and technology advances that impact the ability to accurately determine production labor costs while increasing the efficiency in how the data is collected.

The Author

Warren Wolfe is a recognized expert in the field of time and labor systems, having worked with hundreds of workforces throughout the US over the last 25 years. Beginning his career with Simplex time clocks and building systems in 1981, Mr. Wolfe has authored numerous technology advances in labor and workforce tracking and is now serving clients of respected Minnesota-based Points North, a developer of data integration software.

Mr. Wolfe has been involved with all aspects of workforce data collection and his technology solutions, aimed at increasing efficiency and accuracy, have helped companies reduce hours of entry and reentry that now save them thousands of dollars each month.
The origins of current day manufacturing can be traced back to Eli Whitney around the year of 1800 when he perfected the concept of interchangeable parts. Since then, the advancement of different technologies has stimulated more efficient manufacturing processes.

With today’s global markets and off-shore manufacturing, companies have to be even more diligent in tracking product costs - especially the labor involved in those costs. This presents special challenges to all manufacturers. Determining costs of raw materials, infrastructure, machinery and overhead can be accomplished more easily than calculating, in real-time, the labor costs involved and knowing what stage a customer’s order is at any given time.

The Challenges of Tracking Shop Floor Labor

Many companies have invested heavily in ERP and other manufacturing systems, but the data that drives these systems is still collected manually on paper. Once the paper timesheets are collected, they need to be manually keyed into other systems.

Because of this manual process, labor reporting by job is neither efficient nor accurate. Accurate and efficient shop floor labor tracking is essential to determining the actual costs to produce a product.

Delayed Cost Reporting

When employees write the time they spend working on specific jobs on paper, the labor used to produce product is not known until typically the following day.

These delays often occur due to:

- Collection of the timesheets/time tickets from the employees
- Transporting the timesheets/time tickets to accounting
- Someone in accounting manually keying the data into other systems (this usually performed the following day after the time was recorded by the employee)
- Generating reports for management after it has been manually keyed into the other systems

Therefore, the actual costs to create a specific product are not known until after the fact.

Slowed Decision-Making Process

If issues arise in the production process and remain unknown until it’s too late, correcting the issue may not even be possible. Production managers need to be able to react quickly to issues that arise so the entire production process and product is not jeopardized.
Inaccurate Reporting Due to Manual Errors

When shop floor data collection is not automated, unintentional errors occur from manual data entry. Typically, this shop floor labor data is manually keyed into multiple systems. Each time these manual entries occur, there will be a possibility of errors which in the end means inaccurate cost reporting.

These errors can also originate when the employee hand records their time. Handwritten timesheets/time tickets present special challenges:

- The employee must write down the correct information
- The employee’s handwriting must be legible
- Timesheets/time tickets can have smeared letterforms
- Timesheets/time tickets can be lost between the time the employee hand writes the time and when they are received in accounting

The reporting is only as good as the data used to generate the report.

Labor Involved with Documentation Storage

Recording shop floor labor times manually produces paper documents, which have to be sorted, categorized and stored after they are manually entered into other systems. This not only makes it very difficult to go back and retrieve time tickets when necessary, but requires physical storage of the documents as well.

Documents stored for auditing purposes are often very difficult and time consuming to retrieve. Many times, these may be stored off site or in locations with difficult access. Once the archives are located, then the specific requested documents must be located then reviewed.

Storing paper documents is not the most efficient or reliable method for tracking historical data.
Figure 1: This is the typical process that companies use to collect, process and report on shop floor labor data.
The Solution: Automate Shop-Floor Labor Data Collection to Increase Production Efficiency

All manufacturers strive to increase efficiency and accuracy in the production of their products. Over the years, many processes and technologies have been created to produce products more efficiently and deliver the finished product at a more affordable cost to the consumer.

Henry Ford, thought by many as the Father of the Assembly Line, took the world by storm with his ability to mass produce a single product quickly and economically. While this was good for consumers, it wasn't necessarily good for the employees. His processes were good for producing a single product like the Model T but were not good for adapting to varying models or specification changes.

Taiichi Ohno, considered by many as the Father of the Toyota Production System, while concentrating on the elimination of waste, increased quality and implemented improvements to the production process that are still considered the standard today. With his innovations, Ohno took an almost bankrupt car company and made it into the richest automotive company in the world.

To build upon the contributions of these pioneers to improved production processes, let's examine the labor aspect of manufacturing.

Instant Access to Real-Time Data

Being able to access real-time labor data is very important for both supervisors and management because instant access to the labor data can be used to reduce or eliminate:

- Supervisors having to walk around and find out what their employees are working on
- Supervisors having to review hand written timesheets/time tickets for accuracy
- Manual data entry into other systems
- Manual calculations and reporting of labor costs

Automation allows and/or enables:

- Employees to log in and out of jobs on the shop floor using touch screens
- Real-time data availability of information to supervisors and management for reporting and/or integration
- Viewing of information by supervisors on the floor or managers from their desks
- Sales people able to review the status of jobs from their desk. When customers call to check the progress of an order, the sales person can provide up-to-the-minute status.
Improved Decision-Making

Tracking production labor in real-time also means that if negative-impacting situations occur during the production process, they can be dealt with as they occur instead of days later. If certain processes are taking longer than they should, automation enables the issue to be addressed now instead of when the timesheets/time tickets are manually entered into other systems.

Automating the process allows for more informed decisions based on currently available information.

Eliminating Manual Errors and Increased Reporting Accuracy

Automating the collection of shop floor labor metrics can eliminate what has always been an error prone manual process. Automation should have the ability to be integrated with ERPs, time and labor, GLs and other systems. Using an automated system, which stores the data in an open SQL database, provides almost endless possibilities for reporting and integration with other systems.

Automated Shop Floor Labor Reporting Process

Figure 2: This is the typical process using an automated system to collect and process shop floor labor data.
Recognizing Inefficiencies and Doing Something About It—A Case Study

A world-class original equipment manufacturer for the automotive industry recognized that their manual tracking of production labor was inefficient and error prone which impacted the accuracy and timeliness of production labor reporting. Although most of their other systems were automated, their employees were still logging time on jobs by manually writing the times on paper production tickets.

The Manual Process of Tracking Labor Hours

These are the steps the company was using to track employees’ time spent on the production floor:

- Each employee hand wrote job time, work centers and labor codes on production tickets
- Supervisors took the production tickets and reentered the job times into a spreadsheet
- The spreadsheets were then sent to the payroll department for the data to be re-entered into other systems
- The payroll department reentered this information into the payroll system
- Then the data was sent to accounting
- Accounting would then enter the data into the accounting and ERP systems.

The OEM saw their process as labor intensive, inefficient and inaccurate. Because the incoming data was questionable, the accuracy of reporting was also questionable. The company took steps to improve their processes by automating the data collection process and streamlining the data flow to the other systems.

Analyzing the Current Processes

The company conducted an analysis of the entire process for tracking the time associated with producing their products and uncovered these specific inefficiencies that were impacting their bottom line:

- Each employee was spending an average of five minutes per day to hand write their time on production tickets. With 400 employees and an average burden rate of $20.00 per hour, the company was spending approximately $173,000.00 per year for employees to write their time.
- Each supervisor was spending an average of 10 minutes per day to enter the information into spreadsheets. With 20 supervisors and an average burden rate of $35.00 per hour, the cost associated with the supervisors’ time was $30,000.00 per year.
- The data entry by the payroll and accounting staff was equivalent to one fulltime employee at an average annual cost of $40,000.00.

The result was that the company was spending approximately $243,000.00 per year to track the production labor manually. These costs do not include any costs associated with delayed reporting, error factors or other related factors.
Automating the Manual Processes

The company implemented an electronic data collection system using touch screens on the shop floor for data entry by the employees and supervisors.

Their goals were:

- Reduce the average time that employees spent recording job time
- Eliminate incorrect information being handwritten on production tickets (typically due to poor handwriting, incorrect Job IDs and detail)
- Eliminate the paper production ticket
- Reduce or eliminate the supervisors’ time processing the data from the production tickets
- Reduce or eliminate the multiple data entries made by payroll and accounting
- Integrate with the time and labor system, payroll, General Ledger and ERP
- Reduce delays in reporting on the labor data
- Reduce or eliminate manual errors

While they set their goals high, they knew the processes could be improved.

The Impact of Automating the Processes

Once the automated processes were implemented, the company was able to meet all of their goals. Here are the results:

- Employees’ time to record job information was reduced from five minutes to three minutes a day per employee. This was a 40% savings just eliminating the production ticket.
- The supervisors’ time entering data into spreadsheets was totally eliminated
- The time spent by payroll and accounting to manually enter the data into the other systems was totally eliminated
- Storage of paper production tickets was totally eliminated
- Errors from manual entry of data into other systems was totally eliminated
- Delays in reporting on the data were greatly reduced since the information was automatically integrated with the other systems

Financial Impact Automating

The company invested approximately $40,000.00 to implement the touch screen data collection system.

They realized annual savings of:

- $69,000.00 in employee costs hand writing production tickets
- $30,000.00 in supervisors’ time
- $40,000.00 in manual data entry to other systems

They began to experience a ROI in less than six months.
**Conclusion**

For businesses that depend on accurate and timely shop floor labor reporting, using automation can improve data accuracy and overall process efficiency by tracking job labor in real-time and making it easily available for reporting and integration with other systems.

Automation of labor data collection needs to be simple for the production worker to use while meeting management's requirements for real-time and accurate data.

To explore Points North's solutions and services or to speak to white paper author Warren Wolfe, visit [www.points-north.com](http://www.points-north.com).