



How Much of their Time are Your People Actually Working?

A White Paper by Peter Green

Introduction

Having your people scan a couple of barcodes when they start and end an operation on a job takes only a few seconds and yet can reveal an enormous amount of information, including:

1. The status of a customer job.
2. How many labor hours to do an operation
3. How much elapsed time it took to do an operation
4. When someone actually started and ended work for the day
5. Warnings for managers if an operation is taking too long or an order is running late

In this white paper, we examine the nuances of capturing and using this data to improve the efficiency of operations in an industrial environment.

This is based on many years of experience by the author in implementing job and labor tracking systems, using the BellHawk job and materials tracking software, for a wide variety of industrial clients.

A Warning

While systems like BellHawk can capture labor tracking data, it is up to managers to take the appropriate action when they get results that they don't like, such as discovering that the number of hours worked by their people on customer jobs is way less than the number of hours for which they were paid.

One notorious example of what not-to-do was in an offshore semi-custom furniture manufacturing plant. They implemented a BellHawk system only to discover that their production workers were actually only working less than 50% of their time on customer orders.

Unfortunately, instead of taking steps to improve the efficiency of operations, the managers of the plant decided to stop using the BellHawk tracking software, so that the senior management of the parent company would not discover how badly they were running the plant.

I subsequently learned that the plant had caught fire due to having an open pot of highly flammable lacquer next door to an open flame in a metal fabrication workshop. I guess bad management results in poor operational efficiency, no matter what the cause.

Cheat Sheets

We used to call them “Cheat Sheets” (otherwise known as Time Cards) which were paper forms on which you filled out your hours and the job and operation or task you worked on. At the end of each day or week you filled in your cheat sheet “fudging” the number of hours charged to each job so that it came up to the number of hours for which you were paid.

Today, most “time-card” data entry is done on-line but the cheat-sheet mentality remains, which is why managers are unaware (or pretend to be unaware) that most of their people are actually working far less hours on direct customer work than are charged in their time recording system.

To solve this problem, for production workers, many industrial organizations introduced shop-floor time recording systems which recorded when employees started and ended work on each job and operation. Initially these systems were clunky-to-use, like extended time-clocks, but today are Cloud-based barcode tracking systems, like BellHawk.

These systems can accurately record when work starts and stops on each job/operation, including when an employee starts work for the day on their first job and finishes work for the day on their last job. But there is typically a large discrepancy between the hours recorded and the hours for which employees are paid.

Traditionally there were separate time-clocks at which employees clocked-in at the beginning of their shift and clocked out at the end of their shift. Today paper-time cards have been replaced by electronic payroll time recording systems, which are part of the organization’s ERP system or a third-party Cloud-based application.

But there is still the discrepancy between the hours people get paid for and the hours charged to customer jobs.

Some of this discrepancy is attributable to formal meetings, such as beginning-of-shift departmental meetings, DEI training sessions, and job-specific training. Other time is attributable to informal job-related meetings with supervisors and other employees. Plus, there is time-off for holidays, vacations, sick-time, FMLA, etc. which are handled through the payroll system.

Organizations have tried to have their employees account for every minute they work but these have failed miserably as this results in a tightly scheduled organization with no slack (or extensive use of cheat sheets).

As many authors, such as Eli Goldratt in “The Goal”, have shown, it is important to have slack in a manufacturing organization so that it can dynamically handle changes in demand. But equally, it is important to measure and to expect a certain ratio of hours worked to hours paid, by each employee, excluding time taken in formal company meetings and time-off.

To this end, organizations can use a system like BellHawk to record when an employee clocks in and out, when they start and finish work on jobs, as well as time taken in internal meetings (which have their own job and operation codes).

These systems can then:

- Show managers and customer-support people the status of customer orders
- Show production managers the hours worked versus the working hours paid for each employee plus hours spent on overhead tasks such as meetings.
- Automatically feed hours worked on jobs to an ERP system
- Automatically feed hours worked in total to a payroll system.

The Times are Changing (Once Again)

To quote the famous song by Bob Dylan “The Times They are A-Changin”.

Thirty years ago, a client of mine had over 100 people on the factory-floor. When I last visited, prior to the Pandemic, they had only six people on the factory-floor, running highly automated machinery, to produce more than they did thirty years ago.

As a result, this client no longer wanted to track the hours worked by their people and simply included their labor cost into the run-hour cost of the automated machinery.

During those 30 years, almost all long-run (make-to-stock) manufacturing went off-shore from the USA to the Asia Pacific region, primarily to China.

What manufacturing remained in the USA was focused on semi-custom, make-to-order, quick response manufacturing, with a high degree of automation where possible. These organizations survived because they made products that were highly regulated or too heavy or too big or required too quick-delivery, such that a 6-week delivery from China on an Ocean Freighter was not practical or competitive.

Then along came Covid, the rapid rise of China’s industrial wage rates from under 50 cents an hour to over \$5/hour, China’s Wolf-Warrior diplomacy, the “collapse” of the Global Supply Chain, and the “Amazon” effect requiring rapid delivery of semi-custom products. As a result, everything is changing again.

There is now a major change, from supply-chains requiring operations in 12 or more countries and multiple trans-shipments across oceans, to in-market manufacturing, where as much as possible of the manufacturing is done in-market. This especially applies to the USA, which is one of the world’s largest contiguous and integrated markets for a vast number of products.

As a result, there is a large increase in foreign direct investment in Tier 1 manufacturing plants in the USA for auto plants, semiconductor “Fabs”, medical products, and a wide variety of other product categories. These then require a corresponding in-market increase in the number of mid-tier supplier plants in the USA, as well as in northern Mexico, and southern Canada.

Also, with these shifts, manufacturing in the USA is becoming more labor intensive as there is a limit to the number of in-market manufacturing operations which can be efficiently and cost effectively automated. Assembly work that was done in China at \$5/Hour now be done more cost effectively in Mexico at \$2/Hour, for longer run manufacturing, or \$15/Hour in the USA for quick-turn semi-custom manufacturing.

As a result, it now becomes important, once again, to track and manage labor costs in US based manufacturing plants and industrial distribution warehouses. Also, with ever increasing pressure for quick delivery, it is critically important to track the status of customer orders in real-time, and to take any needed action, to make sure that the orders are delivered on time.

This shift to more labor-intensive operations also applies to industrial distribution warehouses where secondary operations such as repacking, kitting, assembly, cutting, boring, and welding may take place. While, in general, labor for material handlers is included in the cost of operating the warehouse, it is often critical to accurately track the time and cost of these secondary operations so they can be charged to the customer or used as the basis for subsequent bids to do secondary operations profitably.

Commentary

With the return of in-market manufacturing to the USA and secondary operations increasingly being performed by industrial distributors, it is once again becoming critical to monitor labor hours expended in these activities. This is so we can track actual labor hours expended against customer orders, versus planned or bid hours, as well as measuring how much of each employee's day is spent on productive work.

Author

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Dr Green obtained his BSC (Hons) in Electrical Engineering and his Ph.D. Degrees in Electronics and Computer Science from Leeds University in England. Subsequently Dr. Green was a senior member of technical staff at Massachusetts Institute of Technology and a Professor of Computer Engineering at Worcester Polytechnic Institute.

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