



Hill Parts: A Legacy of Excellence

by F. Paul Wyman

Introduction

Hill Parts started from a two-man machine shop in the rural hills north of Atlanta. Over 40 years ago, manual poultry processing was common in the area. Over the years, workers would develop wrist injuries cleaning chicken gizzards manually. Today we recognize such injuries as "Repetitive Motion Strain". But Carl Hill, founder of Hill Parts, saw the need decades ago. He invented and patented a machine to automatically skin chicken gizzards, removing the need for manual effort, and increasing productivity. Hill Parts continues this creativity by finding their customer's need for improvement in standard machined parts.

Today, Hill Parts has a management philosophy that matches the best of companies 100 times their size. They make replacement parts for poultry processing machines. These are industry standard parts made to stock, analogous to the automobile parts business. Manufacturing is subject to a forecast of sales demand. A portion of the business is wholesale, with items being purchased, stocked in inventory and re-sold on demand.

Since 1982, Hill sprouted a progressive team that practices participative management, commitment to quality and meeting customer

requirements. It didn't happen overnight. It required an extensive education program and commitment to both quality and employee involvement. Hill Parts' annual compound growth has exceeded 25% since that time.

Their commitment is to excellence in quality and customer service. Hill followed classic management improvement techniques, more characteristic of billion dollar corporations. The growth is reflected by employment, sales, profit, plant, equipment and depth of product line. Hill now receives a steady stream of visits from leaders in manufacturing seeking to learn how classic principles are being mixed with some basic home-grown, backwoods American recipes to achieve excellence in product quality and customer service.

This article reports how planning and scheduling became strategic in Hill's success. As part of their management development, Hill recognized early that their company systems had to be reality-based, meaning accurate recognition of scheduling, existing commitments, and current capacity. Their focus on customer service includes the ability to deliver on demand. In turn, this goal requires producing to forecast, visibility of orders in process, and an ability to quote reliable ship dates on backorders.

To achieve its goals, Hill focused on **SBT Accounting Systems**, a practical PC-based accounting system, using Microsoft FoxPro as a database standard. Hill forecasts monthly demand from its clients, and builds to stock based on the forecast. This article explains how finite scheduling, forecasting, purchasing and customer service form an integrated planning and execution system.

Trends & Philosophy

Hill Parts has followed the philosophy of finding a niche that needs to be filled. This niche is to offer poultry processors an alternative to buying quality replacement parts from original manufacturers at low cost and upon demand. They have steadily increased their product line from 2 to over 1000 items. Hill has adopted a reality-based philosophy, meaning they recognize that in order to succeed, they have to face reality in their customers' eyes as well as reality inside their own shop.

Problems & Requirements

Hill got into computer applications the easiest way possible. To Jerald Hill, Manager of Marketing and Information Systems, that meant using a PC. They started bookkeeping with SBT Accounting. Hill quickly saw the power and flexibility of an open system that could add customized applications at their own pace without losing past work. Hill made an early commitment to compatible file formats and programming code. Hill wanted sales and shop employees to communicate in a computer network. They felt that a LAN network and FoxPro compatible applications could unify the two worlds of shop and sales.

Tony Wilkie manages the shop and Hill's Technical Data Department. Wilkie states, "When I came to Hill we were adding a lot of new products. We also expanded from just manufacturing parts for OEMs to selling direct to end-users of parts. We were having problems with an undersized shop. We couldn't meet demand. We scheduled for efficiency, and not to customer demand. I had to keep the CNC equipment working smart and busy. But we also had problems with late deliveries."

Jerald Hill points out that Hill considered the full gamut of MRP systems, mainframes, UNIX, and big name scheduling systems. "But they were all contrary to where we wanted to go, and where we felt the technology was going." In 1987, Hill hired an experienced local FoxPro programmer to write a scheduling system from scratch. Hill states, "Then I was in the library one night around 8:00 pm, glanced through a book called The Software Encyclopedia, and I saw JobTime from JobTime Systems, Inc. I phoned and found we were on the right track. They came to see us. Even our local consultant felt like JobTime was a solid system, and used similar concepts that he had intended to develop himself. So we purchased JobTime".

Tony Wilkie was the computer expert in the shop at the time and was assigned the job to implement the new scheduling system. Fortunately, he had already developed routings, which were readily imported. Hill also discovered that JobTime supported far more detailed costing than their accounting system, including setup and processing cost rates that vary by product and operation type. By updating JobTime accurately, Hill was also able to track budgeted versus actual dollars, units, and labor hours. The cost data also enables Hill to realize which parts are making money, which parts are losing money, prices that need to be adjusted, and opportunities for improvement.

Technical Implementation

Hill's typical shop routings start with sawing raw material on a CNC Lathe, followed by turning, milling, or deburring. Each part is targeted to only certain CNC machines, based on distinct preferences part by part. Preferred CNC machines have special capability and are ones loaded with relevant CNC programs. About half the orders need

an outside service for weld, heat treat, sand blast, and polish. Then parts come back for finishing and preparation for shipment. Some parts need to be assembled before shipping. For proper scheduling, the assembly activity cannot be scheduled to start ahead of the component part work orders.

Scheduling Challenges

Hill Parts had several challenges to be able to schedule accurately. The CNC constraints were met by using a built-in 'Preferred Work Station' feature. To minimize job cycle time, routings were designed to encourage task overlapping between consecutive CNC operations. This encouraged moving parts by piece or batch, building recognition of flow into the schedule.

The model schedules to the machine, not to the operator. This is important since one operator can run two machines. And as part of their commitment to reflect reality, Hill made setup times, production rates and costs as accurate as possible. To reflect outside services, Hill lets each task be designated as finite capacity or infinite capacity. The outside contracts are assumed infinite, with a fixed "task" lead time. The schedule recognizes the accurate lead-times by part, operation, and vendor for outside sub-contract services.

Hill also explicitly schedules assembly work orders. Schedules reflect that assembly jobs cannot start until sufficient supplies of all components have been fabricated. This assures proper sequencing of component and assembly work-orders.

Support and Implementation

Wilkie states about support: "One of the things I liked was that I got straight answers

about what the system could and could not do. They responded and followed up on what they said they were going to do. Now I can use the JobTime report writer. In fact, I used the report writer create the schedule that goes on our shop floor."

Shop Conditions and Acceptance

At first Hill felt they needed to schedule every day. According to Wilkie, "Now we schedule only once or twice a week. The shop follows the schedule real well." This still leaves flexibility to fill an emergency back-order and reflect changes in the next scheduling cycle. With improved forecasting and safety stock, back-orders were also reduced.

At first, the shop had concerns about being scheduled by a computer. It required cooperation from everyone to make it work. People see a responsibility to meet the schedule, but the workload assigned is within reason. And that fits well with participative management.

Hill feels the system improves job quality, according to Wilkie, "when they walk in Monday morning they see what their job is going to be this week. They see what they've got to do to get the work out. It gives people more of a feeling of having some control over their work, and saying 'this is what I've go to do'." People are more confident they will not be re-scheduled on an emergency job every few hours. Prior to the scheduling system, this had been a problem.

Expanded Systems Growth

Jerald Hill continues, "From my perspective, the important thing is a good solid information base and the flexibility to use that information as we build new systems." Hill has now added sales order entry

systems, which instantly reflect inventory information from accounting, and shop order schedules from JobTime. In addition, Hill is implementing the JobPlan and JobTrak companion modules, both developed in FoxPro for Windows. Hill states, "Future systems work with existing systems. That gives us an integrated operation, helps us see what we need to do and recognize what the future holds for us".

Hill Parts also has no regrets going the PC route rather than a mainframe or UNIX approach. "What's happening now with PC's and Microsoft is starting to fulfill the direction we expected to happen. We don't have to worry about downsizing", Jerald Hill candidly observes.

Benefits & Improvements

A key benefit of finite scheduling system is schedule visibility, either in the form of printed shop floor lists, and now with on-screen schedules at each terminal. Other benefits include less material on the shop floor and faster response to back orders. Tony Wilkie says, "We have visibility of job status inside the shop. Today, I really could not run the shop without it".

Another scheduling benefit is to forecast the shop's future capability, which Jerald Hill considers required information for good marketing. He says, "You need to know when and where it is appropriate to add manpower".

Other benefits include significant reduction of raw materials inventory. "We're now closer to Just-in-Time than we have been before. It's definitely moved in that direction", Hill states.

Hill Parts has also implemented JobPlan, JobTime's companion forecasting and

operations planning module. Each year Hill uses JobPlan to make a full scale forecast and shop schedule. In addition, it also is run regularly to plan material purchases and shop orders. The JobTrak module provides shop-floor tracking and automatic updating of JobTime based on operator updates, eliminating printed work-center to-do lists and manual updating.

Tony Wilkie states "Last year it took me two weeks to enter all the orders into JobTime for our annual business plan. This year, using JobPlan it takes less than a day to build the data and re-schedule it". Jerald Hill mentions, "JobPlan takes the place of MRP for us. It helps us forecast, calculates independent and dependent demand, considers inventory, open orders, lot sizes and safety stock. We intend to keep perfecting it. Like JobTime, JobPlan and JobTrak are compatible with our database strategy."

About the Author

F. Paul Wyman is founder and president of JobTime Systems, Inc., the first vendor to offer discrete-event based simulation shop scheduling software. He also holds PhD and MBA degrees, with concentrations in Production Management. He was a college professor 1970-1973, and has since been an industry simulation practitioner, with Bechtel Corporation and Apple Computer. He received first place in the 1977 OR/MS Edleman Prize Competition for Operations Research In Practice, and is author of "Simulation Modeling: A Guide to Using SIMSCRIPT", plus numerous scholarly and implementation articles in scheduling and simulation. He can be reached by Internet at jobtime@pacbell.com. JobTime's Internet URL is www.jobtime.com.