

# Advancing M2M: A View from the Soil Room

*Automation enhances productivity while saving labor*

**By Mike Frankeberger**

*Keeping track of soiled linen in a laundry has come a long way since the days when employees had to count and record incoming items by hand. Since the late '80s, soil sorting technology has evolved from the vacuum tube tables shown below and at right to the "one touch" system shown at center which automatically transports, weighs, counts and delivers goods to a cart or sling.*

**T**he basic process of having soiled goods placed into a bag, tagged, delivered to the laundry and sorted by hand is as old as laundries themselves. Today, the need to be competitive requires efficient throughput, verifiable data gathering and excellent material handling. To accomplish these goals requires a redesign and new approach to the soil room.

A century ago, soiled linen was manually sorted and counted and then handwritten on a pickup ticket. Tickets then went to the office and a data-entry clerk entered the information into the billing system. Manual counting—becoming a thing of the past, but still is in use today—is the slowest and least credible method of counting incoming soiled linen. Over the years, there have been several



methods used to overcome obstacles created by the manual counting process.

There are many reasons the soil room cannot be left to the manual processes that once were standard. Government regulations, material handling requirements, disease control, ergonomics and labor unions, coupled with the economy of space and the cost of management and facilities, mandates greater use of technology and automation. The soil room has become more complex in its traditional role as the first step in the long chain of events to produce a quality end product.

Companies with the highest profits often show the lowest production cost. A look at some of the tools available and the methods by which they can be integrated into your current system may show you how to lower your production costs. The correct system can be basic or as custom as your specific business processes. The payback can be substantial. A specific method or combination of methods often can get you ROI in less than two years.

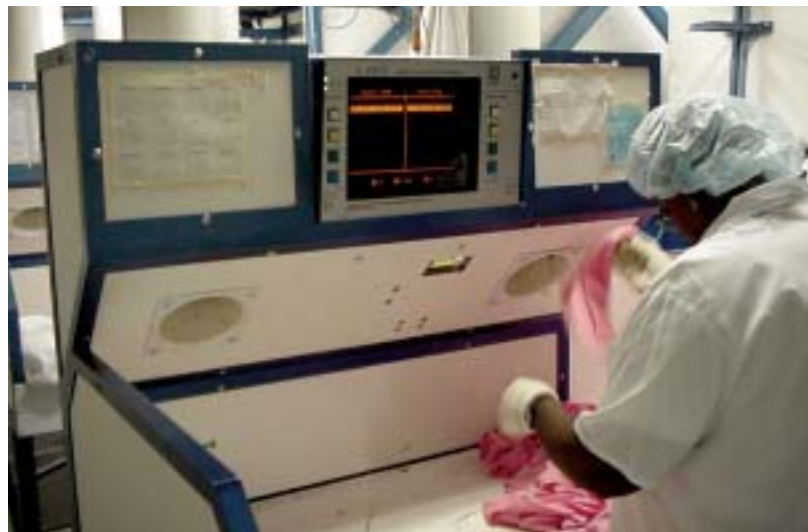
### Early evolution

Designing the proper automation tools for your specific use is the key to a successful soil room. The soil room can be a difficult area

to automate. The trick is to design the system so it can be converted and expanded easily as your business changes. Let's take a look at some of the tools and see what has taken place in the soil room in the past several years. A few examples of soil room equipment progression in both equipment and communication is a good place to start.

First, of course, there was the physical movement of receiving, sorting and transporting the goods to the washer. Carts and baskets always have been used to move and categorize the incoming flow of goods. Gravity-fed monorail was created in many flavors from many suppliers to relieve some of the space and ergonomic problems associated with handling and working with goods. Primarily used and installed for storage overhead to ease floor space requirements, gravity-fed monorail is now mixed with vacuum and weighing stations. Today's tunnel and open-pocket washers are designed to work from a monorail feed, so now both the soil room operator and the equipment must be even more careful to deliver the goods with an exact weight to the washer.

After movement and storage, validating what comes into the soil room and who it belongs to probably is next on the list of priorities. Light frames were among the first devices to enter the soil room. Primarily created for increasing accuracy, the frame would capture



the item count as the item passed between an emitter and receiver. A small reader attached to the light frame device would capture the counts. The operator listed the item and the total count on a piece of paper. Some models would have small conveyors to help with transporting the goods up and into the sling. Light frames have grown into full-fledged systems with LED (light emitting diode) readouts, coupled with computerized systems, and are completely interfaced with the facility's network. The main drawback of light frames has been their inability to increase throughput compared to motorized sort systems.

Pneumatic conveying was next on the scene, with the first vacuum patent in 1987. Most of the earlier vacuum systems were plagued with problems associated with underbudgeting. Labor was less expensive and so was the cost of goods, so the purchasing price of a pneumatic conveying system had to be relatively low. Many of the vacuum bins were made of plywood, while many of the count-

## Washroom Innovation

ing tables were made of Formica. Design problems existed. Many systems came with a common motor that was used to draw from two or more tubes. In visiting a number of locations where this was the case, we saw systems where it was necessary to cover one outlet in order to use another.

Accuracy also was an inherent problem in both light frame and vacuum systems. Most systems were designed to use the photocell function “on and off” to signal a count. While this may have worked well with light frames, it did not work well with the increased speeds of around 70 feet per second associated with vacuum systems. Modern systems today use a timing algorithm to calculate items as they move through the tubes, and they are extremely accurate. Today, these systems can cut your current sort staff by 50% and increase the accuracy of your data-gathering process.

### Smart soil rooms

The major changes in the soil room process came with the introduction of touch screens, stainless steel construction, ergonomic tables/stations, self-diagnosing controls, lint filters, connectivity to corporate networks, automated data capturing and Programmable Logic Controllers (PLCs). Today’s soil room equipment can act intelligently and convey information in a real-time format back to the office without the need for data entry. New tools and safety solutions can be created to improve soil room capacity, throughput and standards. The benefits include higher throughput per hour; a seamless route-accounting interface; and production tracking by person, team or department. These tools also allow the billing of abused or lost items, which creates a significant revenue stream. These are but a few of the benefits of the properly designed, automated soil room.

Today you can purchase an automated soil room system that combines the various types of equipment, totally integrates them under a single software package and interfaces them into the washing and drying equipment. For example, if you need to count, you can combine three methodologies for processing soil on one stainless steel, ergonomically designed counting table. These methodologies are light frame, vacuum bin and positive displacement, which, when combined with monorail feed and take-away system, provide impressive material-handling capabilities.

### Counting methods

Below is a discussion of each counting method:

The light frame is mounted on the side and has the ability to slide back and forth, covering the area of three sling carts. This handles the CRTs and any other items you might not want to send up to a vacuum tube. On the backboard of the table are two six-inch PVC tubes. The first tube is connected to a vacuum bin that receives the small-quantity items and deposits them onto a flat belt conveyor that automatically indexes forward, one bundle at a time, until the belt surface is full, and it is time to sweep the goods into waiting slings. The second tube provides vacuum at the table to take the items from the operator, and then performs the trick of converting vacuum from suction to a blow where the air stream can deposit goods directly into waiting sling carts with a one-touch movement. There could be as many outlets into slings, or slings on a rail, as you prefer.

By taking three separate methodologies and combining them into one count station, you can empower the operator with three distinct choices to dramatically enhance throughput. A light frame can take care of the items that need to be placed to the side and not into a tube. The vacuum bin over the flat belt conveyor handles all the odds and ends in low-volume items. Sweeping the belt can be done when it is full, if it is in a small plant that is a one-person operation. In larger facilities, sweeping the conveyor belt, of course, can be one person’s job. Having a blower deliver soil items into approximately 4-8 outlets can be the backbone of your system—where the majority of the weight and pieces flow. This system has the ability to calculate an assigned weight for automatic weight calculation critical to loading tunnels. These 4-8 outlets normally represent the high-volume items, or approximately 75% of total goods counted. Having the ability to reach any of several containers, allowing for rapid sorting and transporting of goods, greatly enhances productivity and accountability. This is the backbone of the system. And all of this can be interconnected with an overhead monorail system for automatic feed and take-a-way to the washers.

It’s called M2M—advancements in machine to machine and/or man to machine communications. This is the new look and feel of machine communications for the future. Soil room devices and equipment have made great strides in the past 15 years due to M2M advancements. Counting accuracy has improved by the use of timing algorithms so that items are timed and the time is counted. Calculating counts allows adjustment to specific material types and soil amounts. Plant-wide M2M communications range from conveyance controls for plant-wide monorail and weighing systems to flat belt conveyors for RFID tags, to pneumatic conveying directly into assigned slings. Each of these—in either a stand-alone or combined format—can interface with other washing and processing equipment in M2M communications. The emergence of flat-panel touch screens, networked command centers and LED readouts—coupled with Internet access—have transformed the way we view and analyze information. All of this is now a reality with totally integrated software. Once you understand today’s advancements in soil room equipment design and technology, you may discover a method that will work well for your soil room and plant.

The success of automation in your soil room starts at the top of the company. Correct planning for all requirements and contingencies, with a buy-in from sales and service, is a must. You need to consider how to interface the equipment into your overall system, including production tracking and reports. The system should be designed for maximum profitability and inventory control to ensure a successful venture.



With good companies available to help design a winning system using experience, AutoCAD design and other automated tools, you can let your imagination through discovery be your guide. **TR**

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