

## Case Study

# Carving Out the Waste

## Lean Path Embeds Tracking Capability Into the Institutional Kitchen

### ABSTRACT

*By Sarah Pick*

Non-commercial foodservice operations such as colleges, corporate dining facilities and hospitals wrestle with the problem of wasted food. In these high-volume venues, where the same population eats every day and the menus change, it is an enormous challenge to produce just the right amount of each item, leading to pre-consumer waste as high as 3-7% of purchased food. LeanPath, Inc., has developed ValuWaste®, an integrated food waste reduction program that includes hardware, software, training and coaching packages that can help both non-commercial and hotel conference center operations cut the cost of food as much as 2-4%. ValuWaste is built around a scale and terminal fitted with an application-specific graphical interface that make it easy for employees to weigh all pre-consumer waste and record classification data. The data is transformed using ValuWaste PC reporting software, enabling food service operators to identify root causes and drive change. The ValuWaste hardware platform was developed by the LeanPath engineering team in just a few months using an ADS BitsyX running Windows CE.

### The ValuWaste Tracker at Work



The scale and terminal, known together as the ValuWaste Tracker™, are computers for today's kitchen. With graphics, multi-lingual capability, and touchscreen, waste recording becomes quick and easy for busy kitchen staff.

With a carefully engineered human interface, accurate measurements can be made in high-volume, fast-paced kitchens.

## Lean Path Embeds Tracking Capability Into The Institutional Kitchen

### Introduction

Restaurants with a repeating menu and different customers have the luxury of being able to track patterns in food usage. They can anticipate those patterns and use the data to adjust purchasing and production to keep waste low. Non-commercial kitchens, as in hospitals, universities and corporate cafeterias, face different challenges to track food usage. Typically, these venues serve the same population daily with an ever-changing menu. As menus change, it can be hard to estimate how much of each food item will be consumed.

In addition, non-commercial operations are typically very budget-sensitive, since unlike commercial operations, food service is typically a cost rather than a profit center. Finally, most restaurants focus on one line of business while non-commercial operations simultaneously provide service to retail customers, cater events, and serve residential populations such as hospital patients or students with specific nutritional requirements. These factors create a climate of complexity.

In this environment, waste is a universal challenge and changing processes and procedures to improve the situation takes special management effort and tools. The key to any improvement process is measurement, and

for this process, the measurement is done with the Tracker scale and terminal. Employees use the device to weigh all pre-consumer waste. Historically, non-commercial kitchens have either lacked waste tracking systems or relied on visual estimations of the number of waste servings, which is often inaccurately assessed. If collected, managers relied on paper recording methods, such as hanging clipboards, supplemented by manually maintained spreadsheets.

Andrew Shakman, CEO of LeanPath, recognized that a process improvement initiative around food waste reduction could provide tremendous upside for non-commercial food service operations and also hotel convention centers. Believing that the industry could use waste data and a structured problem-solving model to drive significant change, he and two partners decided to form a company that would develop a product and service package that would help operators track pre-consumer food waste and engage both managers and employees in the process of reducing waste and cost. They applied their extensive software, hardware, and consulting backgrounds towards solving the problem, and ValuWaste® was the result.

### A Scale for the Rest of Us-

Ninety percent of the scales in the world are designed to reach a specified level of accuracy according to government standards for commercial transactions. The ValuWaste Tracker, which measures waste just before it is thrown away, is different. Because the Tracker weighs waste, commercial certification



**Figure 1- Will he go for the cup of soup or not? Multiply his choice by 1000 employees and you can have a waste management problem.**

## Lean Path Embeds Tracking Capability Into The Institutional Kitchen

of accuracy is not necessary. What IS important, however, is presenting the simplest kind of operator interface to allow kitchen staff - often totally unfamiliar with computers and computerized tracking systems - to very quickly and easily track the wasted food without slowing down their work. To develop waste management procedures under these challenging conditions, the LeanPath executives needed to track only the most vital information: the name of the staff person discarding the food, the type of food (by a category), the weight of the wasted food to be discarded, the reason the food would be discarded (overproduction, spoilage, trim waste, or several reasons), and the tare weight of the pan or other container. The data needed to be stored for later analysis by managers and front-line staff.



**Figure 2- With just a few taps on a flatpanel the amount of waste, the food type and the reason for loss are logged**

## An Entire Support System

The LeanPath executive team knew that the key to successfully computerizing this industry would be in their implementation, deployment assistance and ongoing support.

From the onset, the team determined the program needed to be blame-free. It would be necessary for managers to view waste as a team problem, refrain from using ValuWaste in a punitive manner, and create an atmosphere of fun along with accountability.

With this attitude, they would help many people who were not regular computer users understand, accept and then embrace the tracking program, leading to positive job satisfaction.

In addition to usability, there were opportunities for great leaps forward with data analysis. In the past, paper-based tracking programs failed analytically because managers were too busy to complete the backend process of keying data into a spreadsheet to see trends.

The LeanPath executives believed that high-volume kitchens were an untapped but ready market for data tracking systems using portable embedded technology. If the LeanPath team could develop a data collection device that reduced the tracking process to a few keystrokes on the way to the dumpster, it would clear a critical hurdle. By connecting this device and its data into automated reporting software that enhanced the analytic process, they would create transparency and trend awareness. And, by linking this hardware and software with a unique

## Lean Path Embeds Tracking Capability Into The Institutional Kitchen

process improvement methodology, inspired by Six Sigma, solid training and robust post-launch coaching, ValuWaste would deliver significant benefits for operators.

### System Demands Are Not Trivial

With these overall requirements in mind, the development of ValuWaste Tracker began. The mechanical portion of the solution was commercially available as an analog bench scale, but the application specific electronics and human computer interface needed to be built from scratch.

The product would have to be ruggedized to operate in hot, humid kitchens where it could be washed down with a wet rag. This mandated a water-resistant enclosure, and with that, some sort of low power, low heat-output technology for the electronics. It needed to read the strain-gauge input directly, with a precision A/D. Considerable range, precision and repeatability are required in this application because the weight of waste and tare could vary substantially, as could the dollar value of the contents. Taring is the process of weighing the pan or container that holds the food and then zeroing out the weight of the container, so the only weight tracked would be the food waste.

The product would need a bright LCD, easily readable under kitchen lights, with a touch-screen interface, and appealing color graphics with multilingual capability. Finally, the

product would need secure, non-volatile memory to retain data from a week or more of waste disposals.

LeanPath executives researched embedded computer manufacturers and selected Applied Data Systems as the supplier of the single board computer at the heart of ValuWaste Tracker. The ADS BitsyX had the rugged environmental specs, high performance graphics, and I/O complement they needed. Additionally, the ADS engineering team had experience delivering semi-custom products within quick timeframes, and had excellent partnerships with Microsoft and Intel to keep their product line current.

The LeanPath project team designed a mating connector board, and used the BitsyX I2C bus as an interface to the A/D. They worked with ADS to select and configure a driver for the LCD and touchscreen assembly. ADS was also a good choice because LeanPath needed to select an operating system as well and ADS could support both Linux and Windows CE.

“ADS products are a blank slate for creativity,” said Shakman. “Your designs are extremely flexible. Some features we later found extremely useful for meeting certain customer requirements that were beyond our original product scope – a nice bonus.”

“ADS products are a blank slate for creativity.”  
Andrew Shakman,  
LeanPath CEO

## Lean Path Embeds Tracking Capability Into The Institutional Kitchen

### Operating System Carefully Selected

The project team did a ground-up evaluation of Linux vs. Windows CE. They compared graphics, I/O capability, and the programming environment of the two systems and realized that, for them, Windows CE would provide a faster path to market. Since the Tracker would ultimately exchange data with PC based components of the ValuWaste system, the LeanPath team liked the consistent application program interface in the embedded and offline elements of the project. The same programming team worked on both systems. What they also liked about Windows CE was its good support for multi-lingual operation, including not only Latin, but even Asian character sets because eventually the ValuWaste system will be deployed world-wide.

“Right out of the box, we were able to run our managed code application on the Bitsy, and our engineers had a quick learning curve with your product,” said Stephen Rogers, Vice President of Technology at LeanPath.

Finally, the .Net programming environment with C# made the CE development environment in Visual Studio too attractive to pass up. Using drag and drop techniques on emulators built into Visual Studio, ValuWaste engineers could concentrate on getting the operator interaction ‘just right’ to assure ease of use. Then, with an ADS development system available early in the program, they could verify and

Applied Data Systems  
10260 Old Columbia Road  
Columbia, Maryland 21046  
Phone 301-490-4007 Fax 301-490-4582

debug the programs ‘in situ’ using ActiveSync and other tools operable between the Visual Studio environment and a target embedded system.

### Project Partnership

This was a fast track project, with the first system placed into use only a few months after start of work. From the beginning, ADS worked closely with LeanPath to get successful results. The LeanPath engineering team was able to use the ADS development system “out of the box” and start parallel design and tracking while waiting for their industrial, mechanical and electrical design to develop in parallel.

ADS hardware engineers helped LeanPath create a clean interface

between their sensor board and the ADS BitsyX, and ADS software engineers provided a custom driver and special OS builds. “We were

“We were very pleased with the ADS implementation of the Compact Framework...”  
Stephen Rogers,  
LeanPath CTO

very happy with ADS support,” said Rogers. “ADS support for our program was across the board, hardware and software, and we were very pleased with the ADS implementation of the Compact Framework.”

The project has gone very well. Andrew Shakman summed it up: “We were on time and on budget and the product has been well received in our markets. We are finding the interactive touchscreen is immediately intuitive and the kitchen staff consistently uses the ValuWaste system.”

### Lean Path Embeds Tracking Capability Into The Institutional Kitchen

But ValuWaste is much more than a ‘device’. No matter how clever or user friendly the Tracker may be, it reaches its optimal impact as part of an overall system with support services. This is where LeanPath expertise and the comprehensive design of the ValuWaste system come into full play. The entire reward and support system is bringing new efficiencies into the high-volume food industry.

their involvement in the tracking. We make a game of the system, and get positive input from everyone in the facility.”

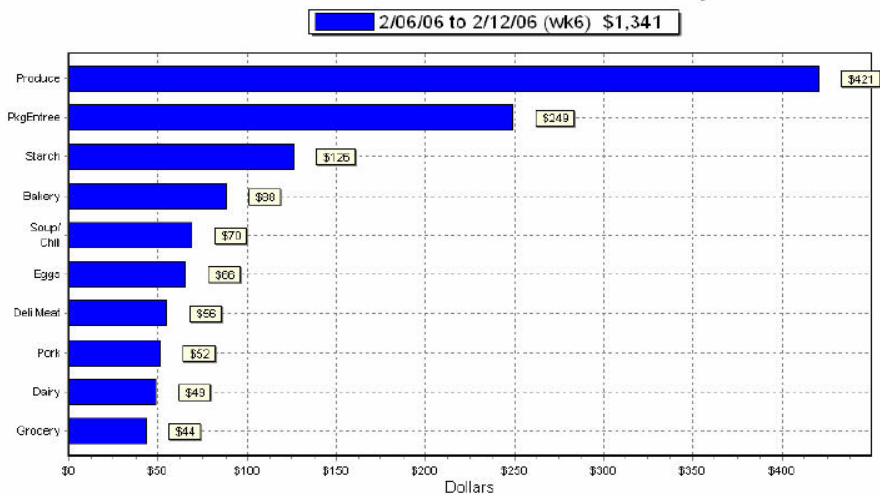
Without ValuWaste, employees are often unaware of the cost of the food items they throw away every day – for example, mashed potatoes or deli meats.

### Not a Scale, a Solution

LeanPath does not sell the Tracker scale as a stand alone item; the scale is paired with PC software and is custom configured for each customer. Periodically, the accumulated waste data is transferred to a PC, by USB thumb drive or network. There, the ValuWaste Advantage software analyzes patterns of use and trends and creates charts and reports to be posted in the kitchen for everyone to see.

A ValuWaste coach is deployed to the kitchen to train managers and front-line staff, as well as assemble a Waste Action Team that will drive the improvement efforts over time. “Earning the support of the front-line team is absolutely critical,” says Carl Nelson, Director of Business Development at LeanPath. This is not about assigning blame. This is about understanding and changing behavior patterns and rewarding employees for

Weekly Waste by Food Type - Top 10 Items  
Trackers: All - Users: All - Foods: All - Loss Reasons: All - Days: All



By working with employees and helping them understand waste patterns, LeanPath executives have helped these employees relate the waste to costs. For example, one employee realized that weekly discards of a certain food item were almost as much as his salary. Waste certainly adds up.

After the launch, the ValuWaste coach works with the team to get the program hard-wired into daily operations and to help managers and the Waste Action Team set priorities and solve problems. Via the coach, LeanPath actually creates a ‘community’ across multiple kitchens, where various facilities can compare their process improvement to similar institutions, and share

## Lean Path Embeds Tracking Capability Into The Institutional Kitchen

techniques and methods. Carl Nelson explains: “we are accumulating, every day, data from thousands of meals served, and see literally hundreds of specific improvement strategies. ValuWaste gives us the tools to analyze this mountain of data up, down and sideways. Our ValuWaste coaches are very good at what they do.”

### Summary

ValuWaste Tracker is successful because it is more than a smart scale. It is an application specific implementation that does exactly what it must, and does it very well as part of an integrated quality improvement system. LeanPath focuses on customer success through an involved coaching relationship and long-term partnership. And, this partnering relationship was mirrored down the supply chain, from LeanPath, to ADS, to Microsoft.

Bob Olsen, CEO of Applied Data Systems, said “The LeanPath executives saw a need for data tracking in a new industry and were able to quickly and efficiently develop a product that is successfully helping the food industry reduce waste. With so much emphasis on “green” products and helping reduce waste, it’s very fulfilling to our employees to be part of the LeanPath success story. We actively hope to support LeanPath with future version of the ValuWaste Tracker through its full product lifecycle and beyond.”



### One Thin Dime

ADS has an unusual business model- we aren’t a design firm- we stay with you for the full product lifecycle. We aren’t a CM- we have our own technology. We aren’t a ‘standard product firm’ - our product roadmap is your product roadmap.

What we are is your partner, thru the cycle of **Design, Introduction, Manufacture and Maintenance and End-of-Life**. Contact us about your next program, ask us about the **DIME**

Copyright ©, Applied Data Systems, Inc, 2006.  
All Rights Reserved. This document may not be used for commercial gain without permission of Applied Data Systems, Inc. Any trademarks used within are the property of their respective owners. This document contains technical descriptions that may not be representative of Applied Data Systems product or services