



Production Lot Control

The Devil is in the Details... And the Process

Remember the good old days when all you needed for lot control was a lot number and a manufacturing date? Well, those days went out with car fins and poodle skirts. Today you need to know everything there is to know about each lot – from what raw materials went into them to which customers received them, with a bullet-proof view of everything in between.

Today's track and trace requirements force you to not only know the genealogy of your products, but of all of the components and raw materials that go into them. This means keeping very detailed inventory attributes on an unprecedented number and level of SKUs, components and ingredients – data not kept by traditional lot control or inventory management systems.

But wait, it doesn't stop there. You also need immediate visibility to all of these items and attributes as they move through your supply chain, with the ability to take quick action should events occur such as product holds or, God forbid, recalls. Thus, the devil is not only in the details, but also in the processes you use to track, trace, view and act on those details. This can't be done with yesteryear's lot control systems.

TRACK – SEE – ACT

Track – See – Act

In the integrated global supply chain networks of our “always on” marketplace, lot control isn’t just a production concern or a distribution concern any more, it’s a corporate survival issue. It impacts everything from efficiency and compliance to customer service and brand protection. Therefore, you need a comprehensive approach and supporting technology to address these requirements. And it has to be flexible enough to be configured to your exact environment, products and corporate policies.

RedPrairie’s approach to lot control, within the larger context of inventory management and supply chain execution, is to support the three pillars of inventory management: track – see – act. What does this mean? We track the detailed attributes of everything that goes into your products from the time they come out of the ground or field until after they are delivered to the final customer. We provide a constant view to those components and products as they move through the end-to-end supply chain. And we provide event management and resolution workflows so you can quickly react to disruptions, product holds or recalls. These capabilities are achieved through RedPrairie’s E²e™ Supply Chain Execution suite in collaboration with trading partners through RedPrairie’s Workflow Exchange™.

The Devil is in the (track & trace) Details

Lot control starts with the production lot code and how it is defined for each customer. A rules-based approach is used in configuring how the lot code and associated data fields are to be parsed and populated. For example, the lot manufacturing date and/or expiration date may be part of the lot code, with the system automatically parsing this data and populating the associated date fields. Or the date fields could be directly entered manually or from another system. Or one date could be derived from the other, such as the expiration date calculated as 60 days after the manufacturing date. These lot rules are configurable by SKU so that one item or ingredient might have a 30 day expiration date

calculation while another has 60 days, for example.

The SKU based rule configuration applies to all SKU attributes. For instance, certain SKUs or ingredients may age at different rates than others. This is often used with meats, produce or any other perishable goods where the lot / SKU status might automatically change based on an aging profile. For example, meat might be grade A for one week, then get downgraded after that. Or a raw material like nitrogen might be top quality for 60 days, common quality for the next 60 days, and unusable after that. These SKU attributes are not only rule-configurable, but also can be defined for multiple units of measure by weight, volume, dimensions and value.

When we say the devil is in the details, we mean not only can you track a virtually unlimited number of rules-based attributes by lot / SKU, you can also track all of those same attributes at multiple component / ingredient levels within each SKU. For instance, you may need to track five different raw materials that go into each cake mix or fertilizer. Or you may need to track fifty components that go into a smart phone, and the sub-components that go into each component.

Other examples of configurable SKU rules include: product picking and rotation rules such as LIFO, LEFO, FIFO, etc; nesting rules for cartonization; and stackability and crushability rules for pallet building and trailer loading. And many, many more. Plus, the system can associate a supplier’s lot number with your internal lot code to facilitate chain of custody analysis.

The take-away from all of this is that RedPrairie has the most extensive, comprehensive, multi-level lot definition and control capabilities in the industry. All of the attributes definable at the SKU level are also available at each successive sub-level. And the attribute parsing and derivation is user-configurable so it can exactly meet the needs of each customer. In addition, the configurable parsing and derivation

THE DEVIL IS IN THE (TRACK & TRACE) DETAILS

of data eliminates keystrokes, making data capture more accurate and efficient. You won't find a more comprehensive and productive lot tracking capability anywhere.

But wait, there is still more. Detailed tracking of lot attributes within your DC network is not enough. You also need visibility to inventory across your supply network, which we will discuss below, and the ability to store and retrieve a complete history of all inventory at the item attribute / lot level to respond to downstream issues such as recalls, shipment problems or other inquiries and analysis needing historical views.

RedPrairie's on-line data repository holds both current

and historical data by date and transaction for easy access, analysis and display. (See Figure 1 for a sample display.) The data repository was built with data warehousing in mind, which means using methods like star schema solutions to optimize storage and retrieval of all data. This approach, coupled with database features like partitioning, allows customers to retain historical on-line data upwards to 5-8 years. This allows all of the screen views and data you would normally access for current operations to be instantly available for historical data as well. Combined with the network visibility described below, this robust data base of multi-level lot / SKU / attribute information provides the control you need for all of your track and trace requirements.

Seeing is Believing (and Controlling)

Figure 1. Sample shipment history screen

The screenshot shows a web browser window titled "Shipment History by Order - Windows Internet Explorer". The address bar shows the URL: http://at3npkrraa01v0.redprairieabs.net/kftwmstst/index.php?ordnum=701227087&to_loaddte_format=. The page content is divided into several sections:

- Administration:** Dashboard, Module Maintenance.
- Inventory Management:** Add Hold, Daily Transaction Display, Inventory Display, Inventory Hold Query, Inventory Summary Display, Lot History, Remove Hold.
- Shipping:** Recall Reconciliation Query, Shipment History by Item/Lot Number, **Shipment History by Order** (selected).
- Dashboard:** (empty)

The main content area is titled "Shipment History by Order" and features a summary table with the following data:

| Site Name | 3PL | Shipped Date | Order Number | Ship-To Customer | Host External ID | City | State | First Name | Last Name | Receiving Phone | Shipped Quantity |
|-----------|---------|-----------------------|--------------|------------------|------------------|-----------------|-------|------------|-----------|-----------------|------------------|
| BETH | US COLD | 09/09/2009 0:00:00 AM | 701227087 | 1033918430265 | COSTCO 265 | MONROE TOWNSHIP | NJ | | | | 6,300 |

Below the summary table is a form for search criteria:

| | | | |
|------------------|-----------------------|------------------|------------|
| Site Name | BETH | 3PL | US COLD |
| Shipped Date | 09/09/2009 0:00:00 AM | Order Number | 701227087 |
| Ship-To Customer | 1033918430265 | Host External ID | COSTCO 265 |
| City | MONROE TOWNSHIP | State | NJ |
| First Name | | Last Name | |
| Receiving Phone | | Shipped Quantity | 6300 |

At the bottom, there is a detailed table of shipment records:

| Order Number | Order Line | Pallet Id | Item Number | Item Description | Lot Number | Pallet Quantity |
|--------------|------------|----------------------|--------------|------------------------|------------|-----------------|
| 701227087 | 2 | 00100447100569141238 | 075928360083 | 562 BOCA VEGAN BURG 10 | 041710 | 12 |
| 701227087 | 3 | 00100447100569141337 | 075928360083 | 562 BOCA VEGAN BURG 10 | 041710 | 20 |
| 701227087 | 10 | 00100447100569279409 | 075928360083 | 562 BOCA VEGAN BURG 10 | 042210 | 6 |
| 701227087 | 5 | 00100447100569144611 | 075928360083 | 562 BOCA VEGAN BURG 10 | 042210 | 20 |
| 701227087 | 7 | 00100447100569144666 | 075928360083 | 562 BOCA VEGAN BURG 10 | 042210 | 20 |
| 701227087 | 8 | 00100447100569145571 | 075928360083 | 562 BOCA VEGAN BURG 10 | 042310 | 20 |
| 701227087 | 9 | 00100447100569145601 | 075928360083 | 562 BOCA VEGAN BURG 10 | 042310 | 20 |
| 701227087 | 1 | 00100447100568896023 | 075928360083 | 562 BOCA VEGAN BURG 10 | 050110 | 20 |
| 701227087 | 10 | 00100447100569153118 | 075928360083 | 562 BOCA VEGAN BURG 10 | 050110 | 20 |
| 701227087 | 10 | 00100447100569194807 | 075928360083 | 562 BOCA VEGAN BURG 10 | 061810 | 20 |
| 701227087 | 10 | 00100447100569194814 | 075928360083 | 562 BOCA VEGAN BURG 10 | 061810 | 20 |
| 701227087 | 10 | 00100447100569194813 | 075928360083 | 562 BOCA VEGAN BURG 10 | 061810 | 20 |
| 701227087 | 10 | 00100447100569194820 | 075928360083 | 562 BOCA VEGAN BURG 10 | 061810 | 20 |
| 701227087 | 10 | 00100447100569194937 | 075928360083 | 562 BOCA VEGAN BURG 10 | 061810 | 20 |

At the bottom left, connection and user information is displayed: Connection: AT3NPKRAA01V0:4750, User ID: KRAFT. The RedPrairie logo is visible in the bottom right corner.

SEEING IS BELIEVING (AND CONTROLLING)

Having the best lot track and trace capabilities still isn't enough, however. You need to know where each lot is and what its status is at any point in time. But there are often too many blind spots in your supply network. Inventory that is at suppliers and contract manufacturers. Inventory at mixing centers and 3PLs. Worse yet, inventory you manufactured but lost track of when it went to co-packers or other service providers, requiring you to re-identify it when it is received back at your facilities.

RedPrairie removes the blind spots with three layers of visibility to provide end-to-end, network-wide access and control over your inventory. It starts within the four walls of the warehouse or DC. RedPrairie's WMS provides direct visibility and control over everything stored or moving within the facility at the lot / SKU / attribute level described above. At the next layer, RedPrairie provides this same visibility and control for all facilities across your enterprise running on the same or multiple instances of RedPrairie's WMS.

The challenge for many companies comes in acquiring and maintaining visibility to inventory / lot information beyond sites controlled by the central WMS. These could be internal sites running other WMS solutions, or which are too small to have a WMS, or the many external sites across your supply network. To address this challenge, RedPrairie offers the Workflow Exchange (WE).

The Workflow Exchange is a suite of secure "cloud-based" workflow and communications applications that seamlessly connect your systems with all of your network partners. WE provides configurable communications, workflow and event management across your network regardless of the technology in place at each partner. This creates a repository of inventory / lot data from across your network that you can access, view and analyze as if it was all one system. Suddenly the blind spots in your network go away – everything is visible. The result is greatly

improved control, with the ability to reduce network inventory levels and operating costs, improve compliance and enhance your brand protection.

Control means Action

Although the visibility to detailed lot / SKU / attribute data offered by RedPrairie's WMS and WE enables you much greater insights into what is happening across your extended supply network, the ultimate goal of lot control is to be able to react quickly and surely when something out of the ordinary happens. RedPrairie's Supply Chain Execution suite has superior tools for this as well.

Besides all of the tracking and visibility capabilities described above, three functions are needed to put true control into lot control. First, you must be able to immediately recognize when things go awry. RedPrairie's event management functionality embedded within the SCE suite enables you to configure exactly what constitutes an exception condition within your network. Multiple level alerts and escalation paths can be set up, and notification can be through any combination of system screens, telephone, fax, or mobile devices.

Once an alert is raised, the next function is often to put any effected lots on hold across the network – whether they are within your facilities, in-transit or

"If you have to do a recall, it is way too late. The key is to be able to stop anything bad from going out the door and that is what this system allows us to do. If we find a problem, we can react and identify the problem vats or cases and stop them before they get to the customer."

Ralph Viscomi,
Senior Vice President of Information Services, Cabot Creamery

CONTROL MEANS ACTION

at a partner site. For those facilities controlled by RedPrairie's WMS, a simple hold screen immediately puts the lot on hold, preventing picking or shipping the lots to customers. There can be multiple levels of overlapping holds. The systems will not allow shipment of effected lots until all holds are released.

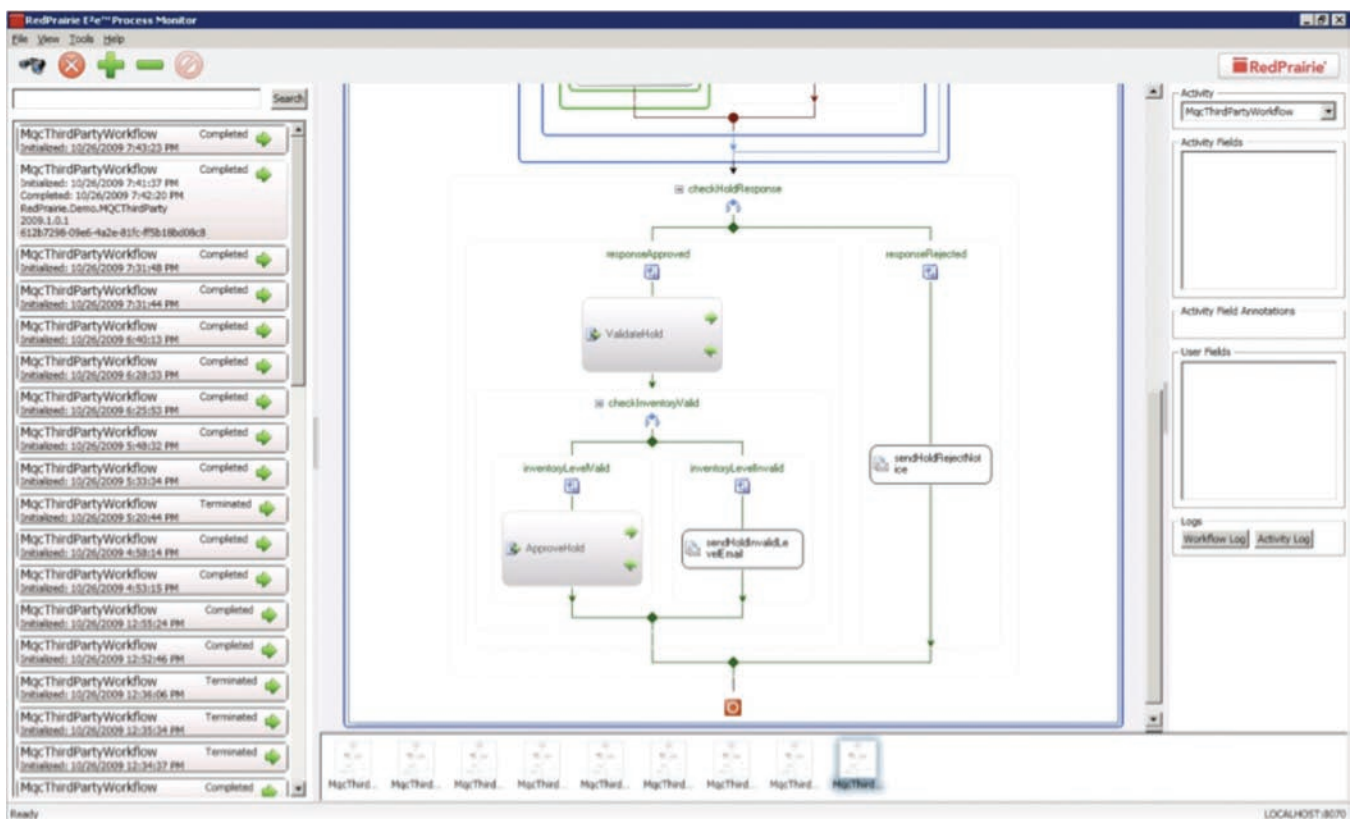
For lots under the control of partners, WE can initiate workflow transactions to notify effected partners to place the lot on hold. The hub of WE is a Business Process Platform (BPP) with a configurable workflow engine that allows you to easily specify the notification workflows and protocols for each trading party partner. This can include notification to your customers as well. (See Figure 2 for a sample BPP workflow configuration screen.)

The third critical function for superior lot control is the ability to retrieve the lot if a recall is necessary. The three capabilities described above – extremely

detailed inventory tracking and shipment history, network-wide visibility, and configurable workflow come together to make recalls faster and more certain.

Here is an example of how that might happen. Let's say one of your suppliers informs you that their lot 1234 of a raw material that goes into your product is defective. By pulling up that vendor lot code in the WMS you quickly identify that lot of raw material was used in the production of your lots AB123, AC123 and BD 234. Using the Hold screen you immediately put those lots on hold throughout your network. Through WE, the hold request is also issued to any trading partners and customers identified as receiving any of those lots. Next, again through your network and WE, workflows are initiated to pull all recalled products from shelves, with instructions

Figure 2 – Sample Workflow Configuration



CONTROL MEANS ACTION

for shipping the product back to you or otherwise properly disposing of it. Workflows can also be initiated to carriers or your own fleet to pick up the recalled product, and new orders can be placed with suppliers for replacement materials or products.

The key to this recall scenario is that you have complete detailed history of production and shipments across your network, with the visibility to quickly identify effected lots and whom they were shipped to, and the workflow to retrieve only the effected lots while simultaneously beginning the replacement process. No other solution gives you this level of lot visibility and control – which translates to more efficient operations, improved customer

service and enhanced brand protection.

So yes, the devil is in the details. But RedPrairie's unique three pillar approach of track – see – act gives you the tools you need to track those details at the most granular level, display and analyze them to determine their impact on your business, and take immediate action when the unexpected happens. Isn't that what production lot control should be?

About RedPrairie

RedPrairie delivers productivity solutions to help companies around the world in three categories – workforce, inventory and transportation. RedPrairie provides these solutions to manufacturers, distributors and retailers looking to support business strategies that increase revenue, reduce costs and create competitive advantage.

With over 20 global offices and solutions that are installed at more than 34,000 customer sites in over 40 countries, companies trust RedPrairie workforce, inventory and transportation solutions to deliver an increase in productivity – with the flexibility to adapt as business needs change.

At RedPrairie, we understand today's operational demands and we're committed to delivering solutions that work. We're committed to delivering solutions for the real world.

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