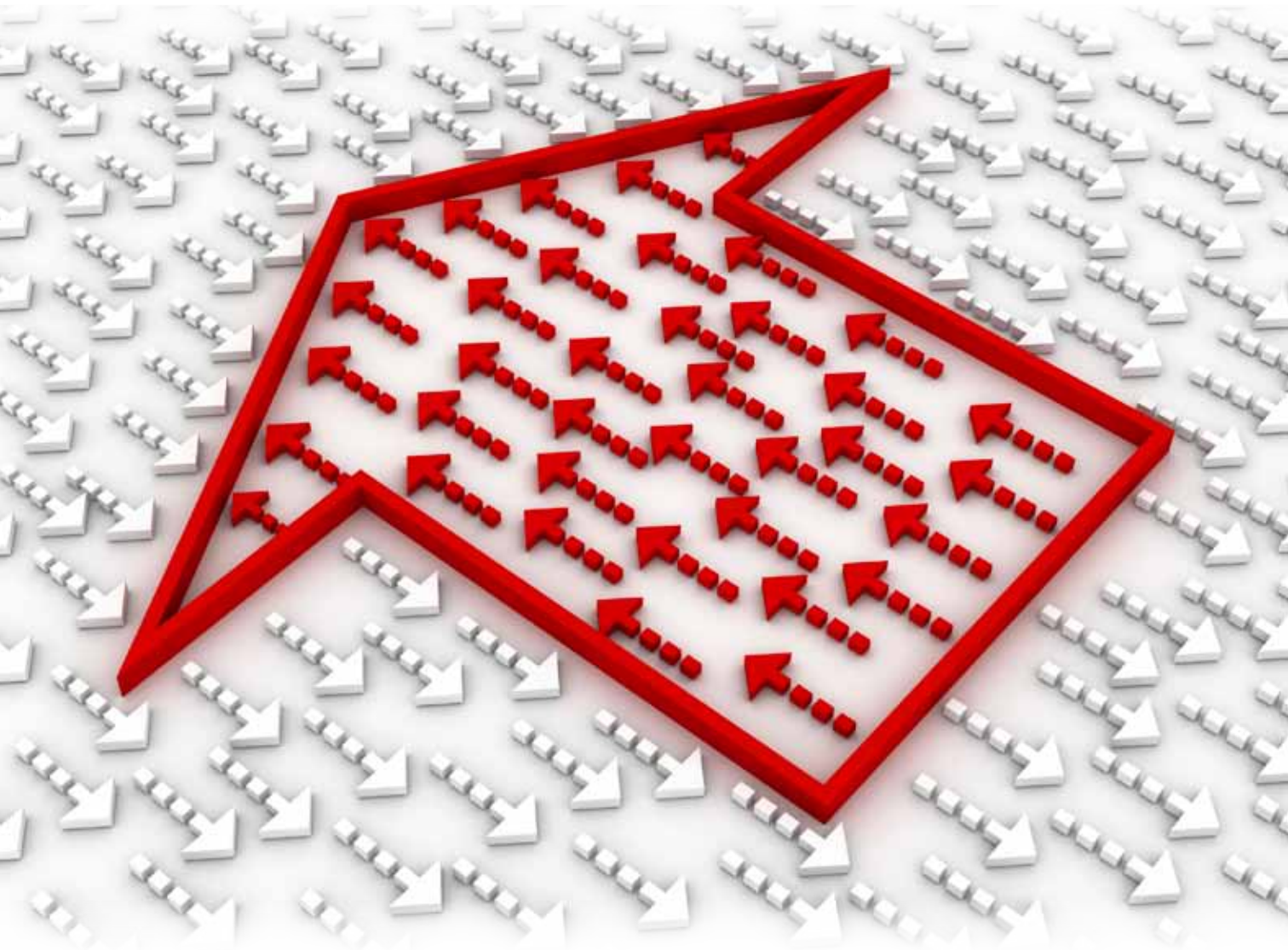


REVERSE LOGISTICS magazine™



Edition 18

**Competing and Reversing
Revenue Loss with
Aftermarket Services
Page 12**



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Competing and Reversing Revenue Loss with Aftermarket Services

by James Patrican and Kathy Kirk, Tata Consulting Services

At a time of weaker market demand and falling revenue, an opportunity to aggressively cut cost, generate additional revenue, differentiate market position and support original product demand is sitting right in front of many companies.

Great interest in reverse logistics has been piqued with estimates that in the U.S. alone, the outlay for reverse logistics adds up to around 1 percent of GDP, roughly \$135 billion in 2008. This can be considered a conservative estimate since reverse logistics costs typically are spread throughout the organization or hidden among various business functions.

Articles



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Combating Keg Theft by Better Managing the "Float" in the Very Unique Supply Chain for Draft Beer - Part 2

by Dr. David C. Wyld, Southeastern Louisiana University

In the last edition, we explored an issue that most bar patrons have never thought of when visiting their neighborhood tavern. However, the theft of beer kegs is an issue of intense concern for all involved in managing the "float" — the keg inventory that is the basis of the very unique forward and reverse supply chain for draft beer. The humble beer keg has become a "hot item" for thieves. In the second part of this article, we examine the legal, educational and technological solutions being employed to protect the beer.



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Opposites Attract: A Happy Marriage of Forward and Reverse Supply Chain - Part 2

by Dr. ir. Harold Krikke, Open University

First of all we need to ask ourselves: where lies the value of this marriage? Can we make both sides happy? As mentioned, the recovery process recaptures much of the value invested in the forward chain that is locked up in the product, including labour, material and energy costs.

This brings up an important phenomenon in disposition: the substitution effect. Of course, the extra work for collecting, disassembling, control, cleaning and repair requires resources such as energy and money. But in many cases, recovery entails less use of these resources than new production.



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Boosting Service Quality and Customer Satisfaction through Warranty Analytics

by Varun Madhok and John Dillender, Infernotions Technologies

Warranty data is a valuable source of information to the services function of a manufacturer. The services team establishes the metrics and takes measurements off warranty data to understand the current state of the operation. In this article, we focus on warranty analytics as used for cutting the lost costs in services delivery. There are two opportunity areas discussed — service network monitoring and product quality tracking.



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Reduce Capital Costs by Performance-based Contracts

by Jürgen Donders, Gordian Logistic Experts

Between OEMs and operators of capital assets, there is virulent tension. The perception of huge margins on spare parts is an example for that. By so-called 'Performance Based contracts,' this can be avoided. This article describes the opportunities that exist for both OEMs and operators.



Page 40

LET GO! Your Organizational and Institutional Systems are Evolving Faster than Your Ability to Control Them

by Joseph Karcher, Toshiba America Information Systems

Simply put, controls will eventually expire or conspire against the thing that we expect to evolve.

Metaphorically speaking, a Reverse Logistics professional is a like river; adapting, changing, wiggling, struggling and repeating the cycle. We find our way through difficult passes. Unfortunately, establishing a pattern of knowing what is breaking and when it is breaking can be...an obsession. We want to grasp the variables throughout our systems yet the variables ebb and flow into and out of each other, not always as planned.

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Reverse Logistics Magazine welcomes articles and abstracts. Please send to: editor@RLmagazine.com

Articles Cont.



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Avoiding the Pitfalls of International Returns

by Tom Stanton, AFMS

Too often when people export merchandise to a foreign company, preparing for a return of the merchandise or a component of the product is the "farthest thing from their mind." However, if the merchandise is damaged or somewhat different from what the customer expected, the product could be coming back.

Case Study



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Enterprise Reverse Logistics Adds Up to Many Happy Returns for Philips

With innovative web-based ERL solution, Philips now has a more effective and cost-efficient method for handling returned goods...

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To Our Readers

A Letter from the Editor

For the first time, RLA will be partnering with the Consumer Electronics Association as an Allied Association for the International CES 2010 in January. We will be representing not only the association, but you, our members as well! CES draws over 120,000 attendees from the world's leading electronics manufacturers, retailers and distributors. We're excited about the exposure we will gain from the very broad CE world.

Current RLA Members are encouraged to help staff the Association's exhibit booth to promote a greater knowledge of the industry and to educate companies on the solutions you offer. Think of the 20,000 new products to be introduced at this show. For many of these products, the retailers and manufactures have no idea how to handle returns or needed repairs. They need the help of our service provider members! What better opportunity to introduce your company and capabilities.

This is also great opportunity to strengthen the influence and activity of the RLA Industry Committees. Committee Members can participate at the booth to educate attendees on the mission and accomplishments of their committee, to garner further participation in the committees and to build up the committee's network within the industry.

Reverse Logistics is all about being "green" through reuse, repair and recycle. While at CES, be sure to check out the "Sustainable Planet Spotlight" featuring cutting edge technologies that will change the world - benefiting the environment, renewing resources and bringing new forms of sustainable energy to developing areas around the globe.

Don't miss out on this opportunity to be a part of the world's leading tech event. Make sure that your company's RLA Membership is current through February 2010. Contact Leslie at RLA and she can check your company's status and help you renew, if not current.

Exciting times are ahead in Vegas; join us at the International CES 2010 in January!

Best wishes for a safe and happy holiday season,

Christine Morrow



Our mission is to educate and inform Reverse Logistics professionals around the world. RLA focuses on all industries in the reverse logistics process. No matter what industry, High Tech, Automotive, Medical/Pharmaceutical, Publishing, Apparel or Consumer, our goal is to provide RL process knowledge to all industries. We want to educate everyone about the Reverse Logistics Processes that are common to all industries. We have been and will continue to provide our services at a moderate price to our members.

Managing the latest information in repair, customer service, parts management, end-of-life manufacturing, service logistics, field service, returns processing and order fulfillment (just to name a few) can be a little intimidating, to say the least. Yet, that is exactly what the Reverse Logistics Association provides with our membership services. We serve manufacturers and retailers in a variety of settings while offering ongoing updates on market trends, mergers and acquisitions and potential outsourcing opportunities to 3PSPs. We have gained

the attention of 3PLs like FedEx, DHL, USPS and UPS. 3PSPs like Teleplan, Foxconn, Flextronics, Canon, Sony and Jabil, along with small service providers have found that the RLA resources help advertise their services. OEMs like Microsoft, HP, RIM, and Sony, along with Retailers like Wal-Mart, Canadian Tire, Tesco and Best Buy all participate at our events. Our online RL Magazine and Weekly News Clippings help OEM, Branded and Retail companies find service partners that were unknown to them.

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International CES 2010 – Las Vegas
January 7-10, 2010
www.cesweb.org/

CESCA - Consumer and Electronics Supply Chain Academy 2010 – Las Vegas
January 8, 2010
www.cesweb.org/

RLA Conference & Expo – Las Vegas
February 8-10, 2010
www.rlashows.com/vegas.php

Warranty Chain Management Conference – Los Angeles
March 2-4, 2010
www.algassociates.com/wcm/index.html

RLA Conference & Expo – Brazil
April 14-15, 2010
www.rlashows.com/brazil.php

Paper Recycling Conference – Chicago
June 13-15, 2010
www.paperrecyclingconference.com

RLA Conference & Expo – Amsterdam
June 15-17, 2010
www.rlashows.com/amsterdam.php

E-Scrap 2010: The North American Electronics Recycling Conference – New Orleans
September 29-30, 2010
www.e-scrapconference.com

RLA Conference & Expo – Singapore
September 28-29, 2010
www.rlashows.com/singapore.php

CSR, Corporate Giving & Brand Protection Summit – Boston
November 3-5, 2010
www.rlashows.com/boston.php



Message from the Publisher

The year 2009 has been unusual for everyone. The world economic crisis has been a challenge for some while others have cashed in on rich opportunities that surfaced. No matter which camp you found yourself, one subtle issue has remained constant, the need for an improved ERP.

In our first edition of RL Magazine back in January of 2006 I said, "Today, there are several problems facing RL professionals. All of us see our finance departments struggling when it comes to measuring RL cost.

One of the most complex issues for the RL manager is the Enterprise Resource Planning software. ERP software was never designed to monitor the level of RL processes needed at most companies. We ask why the RL modules haven't been redesigned to manage the complex processes that exist today. We hope that some company is working on a solution; if not, maybe someone will take this to heart and start developing an ERP solution for RL that will bring the economics in check to reduce the RL waste that takes away from the corporate bottom line."

Today ERPs include: Product Lifecycle Management, Supply Chain Management (e.g. Purchasing Manufacturing and Distribution), Warehouse Management, Customer Relationship Management (CRM), Sales Order processing, Online Sales, Financials, Human Resources and Decision Support System.

But where is Reverse Logistics managed today in any ERP software? Several software modules to manage the flow of returns, testing, recertification and repair have been developed over the last 3 years. These modules work with some of the major ERPs, Oracle, SAP and even Microsoft, but no ERP has addressed a virtual P&L for monitoring RL by the finance departments. Expenditures and waste can still happen on RL without anyone knowing it occurs.

I've seen several companies that have released software solutions to improve our world in RL. If you would like to find an RL software provider that can be of value to you, please call our staff.

Gailen Vick
RLA President
ReverseLogisticsAssociation.org



Board of Advisors

A Board of Advisors comprised of industry experts has been set up to monitor and assist the Reverse Logistics Association management team in making informed decisions.

Advisors include:



John Benardino – Hewlett-Packard Company

John Benardino is currently a Director of Reverse Logistics for HP's Imaging and Printing Group. In his position, John is responsible for credit issuance, engineering, remanufacturing, and all return related costs. His product responsibilities cover printing, digital imaging, supplies, scanners, and shared printing.



Dan Gilbert – Cisco Systems

Dan Gilbert is VP of Worldwide RL at Cisco Systems, Inc. His charter when joining Cisco in 2005 was to define and create a world-class reverse logistics organization. Dan's global team is responsible for driving excellence in product recovery, receiving, inventory, and recycling operations, and for transforming returned product into value for Cisco shareholders.



Christopher Gant – FedEx

Chris Gant is Director for FedEx Supply Chain Sales. He is responsible for all business development strategy and execution for both the FedEx SupplyChain Systems and FedEx Emerging Products Sales teams.

A 20-year veteran of transportation, logistics and electronic commerce, Chris has extensive expertise in the development and delivery of complex supply chain solutions for some of the world's largest corporations inclusive of both Forward and Reverse Logistics. He began his career with FedEx Ground (formerly RPS) in 1989 as an operations coordinator before joining the company's sales team in 1991. He quickly rose through the sales leadership ranks, holding the posts of area sales manager, district sales manager and senior national account manager for FedEx Ground.



Edwin Heslinga – Microsoft

Edwin is currently the Director of Global Services of Microsoft Devices –

Zune and Xbox. In his position, Edwin is responsible for development and enforcement of policies surrounding returns, all related costs to the returns and is also involved in the Customer Satisfaction Continuous Improvement Council. Working with Microsoft Call Center and the Microsoft Manufacturing Operations, Edwin is driving the improvement of consumer satisfaction through agent assisted support and on-line support while managing the costs.



Charles Johnston – WAL-MART Stores, Inc.

Charles Johnston is General Manager at the Bentonville Return Center, WAL-MART Stores, Inc. Chuck has been with WAL-MART for the past 14 years and his responsibilities include Returns, Imports, Exports, Tires and Printing and Mailing Distribution.



Hartmut Liebel – Jabil Global Services

Hartmut Liebel was named President, Jabil Global Services (JGS), in October 2004. He joined Jabil as Executive Vice President in July 2002 and was named Chief Operating Officer in October 2003.



Dr. Dale Rogers – Univ. of Nevada, Reno

Dale Rogers is the Director of the Center for Logistics Management and a Professor of Supply Chain Management at the University of Nevada. Dr. Rogers is a frequent speaker, a consultant to several leading firms, has been published in several logistics journals and has published several books on logistics and reverse logistics. His current research interests are focused on the following: reverse logistics and returns, supply chain technologies, e-business supply chain management, and supply chain management.



Bernie Schaeffer – Motorola

Bernie Schaeffer is corporate VP of Global Repair for Motorola's Integrated Supply Chain, which encompasses the global operations associated with procure-

ment, new product introduction, manufacturing, customer fulfillment and repair. He is responsible for repair and reverse logistics operations across all Motorola businesses worldwide. His team provides both in- and out-of-warranty repairs, is the fulfillment engine for maintenance agreements and other value-added services, manages asset recovery on equipment returns and is the source of information on product field reliability.



Doug Schmitt – Dell

Doug Schmitt serves as VP of Dell's Global Field Delivery organization with international responsibility for global break/fix field engineers, same day service delivery, spare parts depots, parts planning, service logistics, repair, reverse logistics and Dell's global command centers. In addition to Doug's role as VP Global Field Delivery he has responsibility for Americas Support Services. Previously, Doug held executive and senior management positions in service and finance at Dell, Inc.

Doug came to Dell in 1997 from Sequent Computer Systems where he held various senior level finance positions. Before Sequent, Doug worked in the banking sector.



Tony Sciarrotta – Philips Consumer Electronics

Tony is Director of Returns Management at Philips Consumer Electronics North America. In this position, Tony leads returns reduction and entitlement initiatives for mainstream consumer electronics, and is also currently concerned with further driving the implementation of electronic registration for Philips products at leading retailers. Working with Philips Sales, Service, Marketing, and the Philips Business Excellence Group, Tony is helping drive several teams to improve the consumer experience and subsequently reduce the high rates of products returned with no defect found.

Complete biographies of Advisory Board Members are available from the RLA site at www.ReverseLogisticsAssociation.org/company_advisory.php



Reverse Logistics Association

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Focus Sub-Committees are set up to provide a standing forum for Reverse Logistics Professionals to meet on a regional and global basis and discuss common Reverse Logistics issues at the RLA Conferences & Expos. Focus Sub-Committees educate the industry on reverse logistics:

- “Best Practices”
- Consumer Satisfaction Issues
- Regulations on a Worldwide & Regional Basis
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Competing and Reversing Revenue Loss with Aftermarket Services

by James Patrican and Kathy Kirk

At a time of weaker market demand and falling revenue, an opportunity to aggressively cut costs, generate additional revenue, differentiate market position and support original product demand is sitting right in front of many companies.

Great interest in reverse logistics has been piqued with estimates that in the U.S. alone, the outlay for reverse logistics adds up to around 1 percent of GDP, roughly \$142 billion in 2008. This can be considered a conservative estimate since reverse logistics costs typically are spread throughout the organization or hidden among various business functions.

Within specific industries, reverse logistics activities can be critical for the firm. The high-tech industry is a good example. In general, it is reported that consumers bring back between 11 percent and 20 percent of all the electronic goods they purchase, with the highest return rates for wireless phones, GPS units, MP3 players and wireless networking gear. In 2008, Wall Street Journal reported that the US electronics industry spent about \$13.8 billion to re-box, restock and resell returned products. Among reasons for return, 68 percent of returns are because consumer did not understand the product, 27 percent of returns are within 48 hours and due to buyer's remorse and only

about 5 percent of returns were of truly defective product.

Reverse logistics has always been the concern of OEM manufacturers, including high tech product makers, and electronics retailers. In the face of these challenges and tough economic times, leading-edge companies are now recognizing the strategic value of having a reverse logistics management system as an integral component of retailers' and manufacturers' profitability and competitive position.

The following are some "must do's" with regard to aftermarket planning and execution.

MANAGING REVERSE LOGISTICS IN TOUGH ECONOMIC TIMES

Better product & packaging design and customer support to prevent returns

Companies can make some simple, low cost and easy-to-implement changes to product design and packaging with great impact on the return reduction. Often a very small amount of returns are truly defective products, most of the returns of high tech and electronics returns could be preventable as many buyers do not understand the basics of electronic products such as HDTV. During 2007-08, as the demand for HDTV grew exponentially due to maturing technology and slashing costs, the number of returns also reached an unsettling level due to consumers' lack of understanding of HDTV. There is shocking number of people who buy an HDTV set and never subscribe to an HD service. In some areas, as many as 2 in 10 HDTV sets purchased were reportedly returned to retailers for reasons not related to product defect. Currently the return rate for HDTV stands at average of 10 percent. By understanding the potential issues or blind spots of consumers, companies can do a better job reducing random purchases or returns by providing information on both the inside and outside of box giving warnings, explaining the use of product, providing the supplemental, compatibility and installation requirements.

As an added measure, companies can also improve contact center agent awareness of potential issues with each product and provide information to support the customer that is aimed at reducing returns before they occur. Some user friendly procedures are:

- Simplified and graphical instruction on installation
- Improved product design
- Personalize product by providing engraving service
- Preloaded installation software

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- Added services and free advice to help in the set-up of big ticket items

Companies adopting these practices have seen significant reduction of returns and cost of reverse logistics.

OUTSOURCING OPTIONS

In the slow economy and contracting demand environment, it is an excellent time for companies to consider outsourcing their reverse logistics operations to service providers. This will not only help companies minimize in-house IT investment and conserve critical cash flow, but also take advantage of economies of scale and specialized expertise in planning reverse logistics operations.

For companies that have already outsourced their reverse logistics service

to 3rd party service providers (3PSPs), this is also the time to re-negotiate or evaluate other 3PSPs who can offer more cost effective or improved service that can help minimize inventory and logistics costs to generate new sources of revenue.

Companies will also be able to benefit from service providers who not only provide physical distribution, but also the data collection and synchronization capabilities that tie directly into the customer's accounting systems and business intelligence (BI) database. By utilizing 3PSP service providers, high tech companies will realize multiple benefits such as improved shipment visibility, transit time reduction, a more scalable logistics cost model and the ability to leverage best of breed providers for different areas of logistics.

STREAMLINE REVERSE LOGISTICS OPERATIONS

Companies could cut substantial cost and improve operation efficiencies of reverse logistics processes by standardizing and streamlining return and RMA processes. Companies should leverage the internet to provide robust customer self help and product usability support, handle return requests and RMA authorization and provide real time tracking of return, repair and replacement status. A rigorous web-based rules-driven avoidance management and gate keeping RMA process is essential to reducing costs in reverse logistics operations. Companies can train customers and staff to adhere to the process and policies without compromising the level of customer service.

Another area of focus is streamlined disposition policies and process. Due to strict norms pertaining to the disposition of goods in the high tech market, there is a huge cost associated with proper disposition and recycling of returned products to minimize harm to the environment. In addition, companies are at high risk of these products making it to the grey market and eroding their competitive advantage. Top companies establish clear and uniform policies and procedures to govern the disposition of returns.

For products with minimal environmental risk, some companies leverage shipper/carrier insurance coverage to minimize cost, maximize return on investment and improve customer service. They adopt the practice of having consumers dispose the damaged goods without taking it back. Overstock.com gained scores of enthusiastic customers by simplifying the refund /replacement process without having customers ship back the bulky items. However, they transfer the cost to the shipper via insurance policy.

Companies must adopt the following best practices:

- Implement an IT Asset Recovery process for reusable parts and recycling



- Determine internal consumption of parts after repair
- Reuse parts in their manufacturing line
- Evaluate and simplify return policies and practice based on risk and return on investment

AUTOMATE THE RETURN PROCESS

One way to streamline the operation and improve visibility is to implement an automated web-based returns management system integrated with an ERP system. The end-to-end automation and integration can dramatically reduce the number of calls to live contact center support or unnecessary pre-printed return labels. Another area is to automate data gathering and processes, including warranty validation and tracking. Automation plays an important role in reducing the cycle time of the entire reverse logistics process and hence the overall cost. Automation also helps gain visibility into the overall returns process as it enables 'real-time' tracking thereby improving asset recovery and customer service.

REVERSE LOGISTICS FORECASTING AND PLANNING

Implementing robust forecasting and planning for reverse logistics can seem like a complex task but organizations

can reap huge benefits from improved demand visibility, inventory planning, staffing utilization and cost reduction. By integrating transaction processing, planning and ERP systems, companies can use detailed historical return information to provide forecast and planning for reserves. The reverse planning process also requires the cross-functional participation from sales, marketing, operations and customer support groups.

DEDICATED AND INCORPORATED REVERSE LOGISTICS NETWORK PLANNING

Most companies focus network planning on forward logistics. As the size of reverse logistics increases, the need for effective network planning that accommodates the unique requirements of both forward and reverse logistics is highly recommended. Organizations can improve operational efficiency and avoid competing priorities by implementing a dedicated and centralized returns management process and logistics network planning approach that is independent from the forward supply chain. Effective logistics and truck route planning could help companies better utilize transportation systems and reduce fuel costs. The separation of returns logistics from the forward distribution in

different facilities enables companies to have more streamlined processes to manage all issues related to reverse logistics.

Some companies also customize reverse logistics processes around each product coming back into the supply chain. For example, game hardware versus software requires uniquely different return and disposition processes.

LEVERAGE BI ANALYTICS

Understanding why a product has a high return rate will be critical to improve the product design and delivery process so that returns can be minimized.

There is a wealth of data collected through service event and reverse logistics process. Best performing companies are looking to make better use of the data that they are generating out of their reverse logistics processes. Companies are implementing business intelligence (BI) capability or effectively leveraging their BI capability to capture and analyze data and information associated with return process. This information is subsequently shared across functional areas, especially engineering and design and customer service centers. BI will enable companies to:

- Identify product design defects
- Analyze product failure for trends
- Improve product design
- Develop additional support services
- Train Support Technicians
- Improve customer support and service
- Deflect the returns
- Determine value of customer
- Capture additional revenues through cross sell and up sell opportunities.

Additionally, leveraging BI analytics and information sharing can provide high tech companies the competitive edge in improving product design, gaining market share, identifying hid-

den costs and generating additional revenue streams.

THE ROAD AHEAD: AFTERMARKET – NOT AFTERTHOUGHT

To succeed in a recessionary environment, it is critical for companies to view aftermarket services as a source of growth and to invest accordingly. In addition to helping drive efficiencies and accelerate business activities, it can also serve as one of the last frontiers where waste can be squeezed out of the supply chain process and financials can be improved. RLM



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The Reverse Logistics of Beer: Combating Keg Theft by Better Managing the “Float” in the Very Unique Supply Chain for Draft Beer

by David C. Wylde

Part 2: Exploring the Legal, Educational and Tech Solutions

tide of keg losses from brewers’ floats. Today, thirty of the fifty U.S. states already have what are known as keg registration laws (also referred to as keg tagging laws) in place. This is up fifty percent from the start of the decade! The reason for the rapid growth of these keg registration laws has largely been due to concerns about underage drinking and driving. Keg registration generally entails two steps: individually identifying kegs (with a label, sticker or engraving) with a unique number and recording information on the retail purchaser of the keg (typically including the name, age, address, drivers license number). Some states also require beer retailers to keep records on where the keg is to be consumed and to provide educational literature on proper alcohol service.

States are now beginning to directly attack the keg theft issue through legislation that goes beyond keg registration. Both Indiana and Illinois have now made it illegal for scrap processors to purchase kegs inscribed with the name of a brewer (as almost all are), and several states are considering similar legislation. State Senator Victor Crist, the sponsor of the keg sale ban law currently being considered in Florida, simply stated that: “The window of criminal opportunity must close.” A dozen states now also require scrap dealers to routinely collect personal information on all sellers of scrap metals. So, from a legal perspective, states may indeed be making progress on the legal front. However,

while most legitimate scrap yards will no longer accept kegs, unless they are being sold directly from brewers or distributors, there is still a huge black market in scrap keg sales.

There is also discussion today that both to fight keg theft and to encourage recycling, the time has come to raise the historically low keg deposits in the United States. Beer industry officials believe that higher keg deposits would likely, both for individual customers to follow through and return, rather than scrap, their empty kegs and for bar and restaurants to make greater efforts to secure their keg inventory. There is evidence from abroad to show this to be the case. After Finland raised the nationwide keg deposit to 40 Euros, keg losses plummeted to 0.5 percent. In the United States, the State of Michigan recently hiked its mandatory keg deposit from \$10 to \$30. Brewers themselves are increasingly hiking the keg deposits they charge to distributors unilaterally to try and thwart the keg theft problem, and some small brewers are charging far larger keg deposits to consumers, some as high as \$100. The concern is, of course, that hiking keg deposits charged directly to consumers may curb sales and beer consumption.

The scrap metal industry itself is also beginning to take action on the problem of stolen kegs. The Institute of Scrap Recycling Industries has recently partnered with representatives of the beer industry to publish ads and posters educating scrap dealers on the nature and size of the stolen keg problem and urging them not to deal in kegs from non-beer company sources. The scrap industry group also has sent stickers to its members to post on site with messages for customers and employees alike, simply stating: “We Do Not Purchase Used or Damaged Kegs” and “Beer Keg Theft is Against the Law.”

THE RFID SOLUTION

Despite the theft threat, the “round-trip” of the reusable metal keg is unlikely to disappear any time soon — making reverse logistics an important part of the beer industry. While there has been a push for development of plastic, disposable kegs to lower costs, metal seems to be the best way to preserve the taste and freshness of the brewer’s product. Plus, the keg has been described as the “ultimate reusable container,” with an expected service life of as much as 30 to 40 years. This past May, Dan Mullen, the President of AIM Global, commented that the whole trend towards green products and business practices may mean increased utilization of RFID (radio frequency identification) to aid in environmentally-friendly recycling processes, including those in the beer industry.

Already, there have been pilot projects looking at several full-circle supply chains with recyclable market conditions similar to that of the beer industry and its kegs. These include the LP (liquefied petroleum) gas market (where RFID has been utilized to monitor the inventory of LP gas cylinders) and the bottled water market (for monitoring of refillable bottle inventories). In each case, RFID monitors in-cycle inventory of valuable containers that should have extended life spans and similarly problematic materials (metal with the gas cylinders, and, of course, H2O with

the bottled water containers). Of course, the metallic nature of kegs will add complexity to the situation by hindering accuracy rates. And when attempting to inventory full kegs, the high water content of the beer inside them must also be taken into account. However, the use of select frequencies and attention to tag placement can produce almost total accuracy in tag readability.

Now, companies are recognizing the market opportunity present in the beer industry, responding both to the growing problem of keg theft and the need for breweries, both large and small, to better manage their keg floats. Carrollton, Texas-based Xterprise is adapting its Clarity-RTI system, originally developed for reusable transport items (RTI), including packaging items, such as crates, pallets, and roll cages, for use on beer kegs. The RTI market is significant in size, with market research showing that over fifty million RTIs are lost, damaged or otherwise removed

from service each year, costing transporters, manufacturers, and retailers approximately a billion dollars each year. In May, Xterprise began marketing its solution to the beer industry in both the U.S. and Europe, making use of its Clarity-RTI software with specially designed on-metal tags from Confidex, specially designed to withstand the rigors of transport and cold storage involved with beer keg shipments.

All this adds-up to not just greater security and protection against keg theft, but greater business intelligence that brewers can utilize to better manage their very unique forward and reverse supply chains. At a minimum, RFID can make brewers’ management of keg float and compliance with keg tagging laws more automated. However, with the need for beer to be monitored for freshness and temperature, RFID presents new ways of ensuring that bars, restaurants, stadiums and other pour sites deliver the best tasting product possible to beer



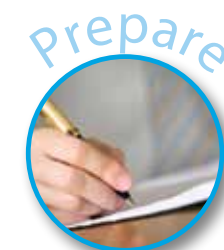
INTRODUCTION

In the last issue of Reverse Logistics Magazine, we explored an issue that most bar patrons have never thought of when sitting down at their favorite neighborhood tavern or an airport bar for a draft beer. However, the theft of beer kegs is an issue of intense concern for all involved in managing the “float” — the keg inventory that is the basis of the very unique forward and reverse supply chain for draft beer. The humble beer keg has become a hot item — literally — for thieves around the world. In the second part of this article, we examine the legal, educational and technological solutions being employed to protect the beer.

THE FIGHT AGAINST KEG THEFT

There are both legal and educational efforts underway to attempt to stem the

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drinkers. Thus, while legislative action, higher deposits, stabilized commodity prices and greater security may help curb the tide of beer keg thefts, the benefits of RFID are substantial for both large international brewers and small, local craft breweries. While the former may deal in greater keg volume, with a greater reliance on tap sales, microbreweries will be highly interested in better managing their upstream and downstream keg inventory not just in securing their keg float, but in delivering a higher quality brew to their customers. So, RFID may be on tap for many, many brewers, representing a leap forward for their reverse logistics operations and their business intelligence and security, as well as a significant market for RFID solutions providers. **RLM**

Want to learn more about RFID technology? Check out Dr. Wyld's two part overview on RFID published in Re-

verse Logistics Magazine: Part I – "The RFID Value Proposition for Reverse Logistics RFID—The Next Generation of Identification," Summer/Fall 2006, at www.rlmagazine.com/edition03p57.php; and "The RFID Value Proposition for Reverse Logistics: Part II – RFID in Action," March/April 2007, at www.rlmagazine.com/edition05p16.php.



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Opposites Attract: A Happy Marriage of Forward and Reverse Supply Chain

Part 2

by Dr. ir. Harold Krikke

THE 'NATURAL PARTNER' ASPECT: A HAPPY MARRIAGE?

First of all we need to ask ourselves: where lies the value of this marriage? Can we make both sides happy? As mentioned, the recovery process recaptures much of the value invested in the forward chain that is locked up in the product, including labour, material and energy costs.

This brings up an important, but often-ignored phenomenon in disposition: the substitution effect. Of course, the extra work for collecting, disassembling, control, cleaning, and repair requires resources such as energy and money. But in many cases, recovery entails less use of these resources than new production. High quality recovery, in whatever option, reduces the need for virgin resources (materials, energy) and replaces partly the new production process. For example, the recycling of aluminum is known to use only 10% of the energy it takes to make new aluminum. This saves energy (cost). The quality of recycled aluminum is equal to the virgin material and perfect substitution may therefore be assumed. So it also saves materials (cost).

Remanufacturing is even more promising than material recycling. Studies of

Giuntini and Gaudette (2003); Gray et al. (2007) indicate that up till 90% of the total original costs are 'recuperated' during reuse. Moreover, energy needed for closed-loop remanufacturing amounts in many cases to only 15 to 20% of the energy needed for the production of new products (Hauser and Lund, 2003). Reduced energy use in turn leads to reduced emissions. Hence, reclaiming resources involves both economic - and environmental gains provided that recovery substitutes new production.

Braungart et al. (2002) in their cradle-to-cradle approach emphasize a green product design, meaning recoverable, biodegradable or incinerable. Their vision links to CLSC management in that processes in the supply chain need 8 to connect seamlessly to these product characteristics. Moreover, the aim to prevent quality downcycling prompts the reverse chain to be a competitive supplier of components, materials or energy.

Which recovery option is best is context dependent (Krikke and Zuidwijk, 2008). For example, automotive tires can be retreaded for reuse or recycled in an asphalt-like process (for surfacing roads, playgrounds, tennis courts etc.), but from an energy perspective it might

be preferable to use it as a fuel, for instance in concrete ovens.

It is not uncommon that sustainability initiatives have unexpected spin-offs (Corbett and Klassen, 2006). One of them lies in reusing know-how. Developing new products based on selectively upgraded or re-engineered components reduces time-to-market, saves on R&D time and cost and also reduces design and production flaws. Thus, the product development process should incorporate the possibility of (modular) design reuse, regardless whether physical reuse will be applied or not. For example, during the 1960s, the shipbuilding industry reduced the cycle time for building a large ocean going merchant vessel from 3 years to 6 months by modularization. Tremendous benefits accrued to the Japanese and later Korean shipping industry. Today many companies reduce time-to-market and improve product quality by re-engineering.

Concluding, the reverse chain is to be seen as a supplier of the forward supply chain, provided that recovery is of sufficient quality to compete. Green product design ("for recycling") is an essential requirement. The forward chain then serves as the 'customer' of the return channel. Resources locked

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up in the product are reclaimed, but this reclaim of value occurs in the forward chain. Time and money is saved in developing new products, using returns information in re-engineering.

So clearly we have two natural partners. Moreover, it is a relationship for life. The closed-loop supply chain de facto follows the life cycle of the product, whereby multiple recovery loops of reuse can be made on different levels: as a product, as a module/component, as a material or in the form of energy. Henceforth, the closed-loop supply chain has three major areas of attention.

INSTALLED BASE MANAGEMENT & SERVICE LOGISTICS

The installed base is defined as the total number of placed units of a particular product in the entire primary market or segment. Installed base management concerns the care of products during operations. It comprises replenishment, maintenance repairs, overhaul, spare parts management, and system upgrades. The installed base is also an important 'reuse' market, for example in overhaul, upgrades or repair. The bottom line is to stay in touch with the market. At first sight this applies mainly to capital goods but also e.g. beverage companies encourage their customers to return empty bottles by deposit systems. The key is to find the right business model.

REVERSE SUPPLY CHAIN

Typically reverse supply chains comprehend (i) product acquisition and collection: all activities rendering used items (product, component or material) available and physically moving them to some point for further treatment, (ii) inspection/separation: results in splitting the flow for various recovery and disposal options. This may involve testing, disassembly, shredding, testing,

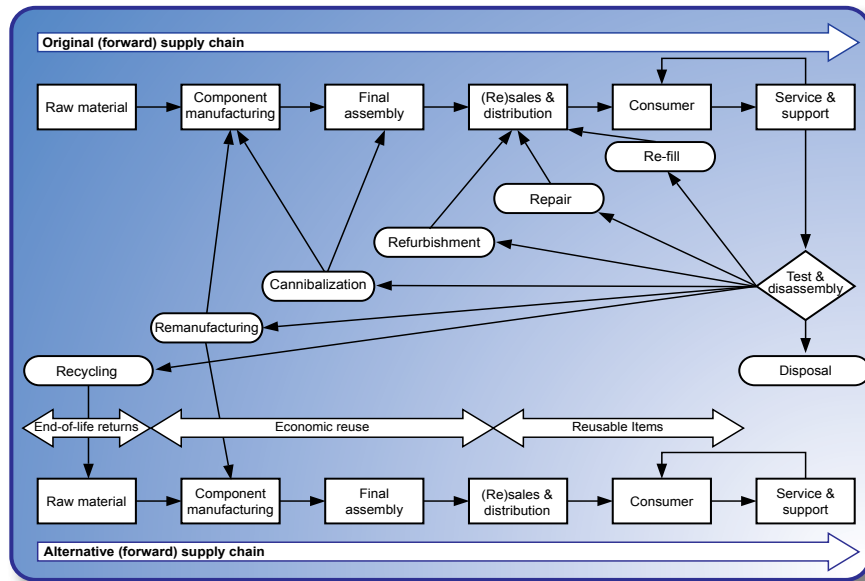


FIGURE 2: THE CLOSED-LOOP SUPPLY CHAIN

sorting and storage, (iii) re-processing: reusable flows undergo the actual transformation of a used item into a reusable item of some kind. Depending on the recovery option chosen, this involves various activities, including disposal and (iv) re-distribution and sales: directing reusable items to a market to new markets, and physically moving them to potential new users.

Genco, a 3rd party service provider (3PSP), specializes on reverse logistics, creating economies of scale that cannot be achieved by its individual customers.

REUSE MANUFACTURING

This process involves the integration of manufacturing and recovery processes so that new production is fed with secondary materials, components or energy. Because reverse logistics serves here as an "internal" supplier of the manufacturing process, one creates competition between virgin and renewed resources. Today, prompted by mass customization a wide range of customized products is produced by a relatively small number of mass produced standardized components and modules. This creates huge remanufacturing

opportunities for remanufacturing, although product replacement rates and obsolescence issues may hinder this somewhat.

Dutch based copier manufacturer Océ Technologies has applied this concept since the early 1990s. Today, more than 50% of total parts and modules supplied to manufacturing are repaired and refurbished, often via the first tier supplier. The company has learned to deal with the increased supply chain complexity and applies dual sourcing, meaning that most machines can be produced in a brand new and a remanufactured version. This makes the company less vulnerable to varying return rates.

The above suggests that it is all peace and amenity. But isn't that too good to be true? Are there no tensions in this marriage? Yes, of course.

There is a huge debate to whether or not possible synergies exist between environmental and other supply chain objectives. First, there is the obvious conflict when choosing recovery options. For example, selling secondary products in cascade markets, e.g. developing countries, may be very economi-

cal but not good for the environment. But there is more to this.

The exodus of the western make-industry to the Far East and Central America has also led to increased distances, complicating supply and communication lines. Rubin and Tal (2008) show however that in recent years the steel industry has started to regionalize again. For example, Mexico has (re-) gained large portions of the US market and Chinese exports have dropped by 20% solely due to rising transport cost. The current recession may reduce the oil prices somewhat, but as the entire market is under pressure, logistics cost need to be reduced. In the future, companies will more carefully weigh global versus regional/local sourcing, as the carbon footprint will increase pressure on global supply chains. Responsive supply chain strategies such as JIT or QR generate too many emissions due to small batch sizes and high frequency of transportation (Nathan, 2007). From a closed-loop perspective the question arises where to locate recovery facilities: close to the market or close to the source? And how to trade-off the additional miles for collection and reverse logistics against the substitution gains discussed earlier?

On the wings of globalization, EPR-based policies contribute to the growth of global waste steams towards cheap sites in China, India and Western Africa. The global waste exports have been regulated by the Basel convention of 1992 which aims at reducing transboundary movements of hazardous waste. However, as enforcement is weak and not all countries have joined the Basel convention, illegal transports are flourishing. Cherry picking has led to low quality and environmentally unsound recovery, often with poor working conditions for 'recycling workers' (Zoeteman et al., 2009). At the same time however, it often provides the only source of income for many people at the bottom end of these societies, causing ethical dilemma's ("which way do you want to die?").



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Balancing the different objectives requires the integration of eco-efficiency into closed-loop supply chain modeling. Eco-efficiency models the trade-offs between economics, customer service and environmental objectives. Ecoefficiency has been defined as a general goal of creating value while minimizing environmental impact. Setting aside the normative part of this concept, the empirical part refers to a ratio between environmental impact and economic cost or value added (Huppel and Ishikawa, 2005).

Eco-efficiency studies sometimes give surprising results when supply chain impact is taken into account. CNW Market Research conducted a (somewhat controversial) "Dust to Dust" study, tracking the energy used in creating, operating, and scrapping numerous different types of cars, even taking into account the different amounts and types of pollution caused by produc-

tion in different countries (www.treehugger.com). The remarkable result is that based on these data, it's possible to claim that Hummers' supply chains are more energy-efficient than average; although the car itself has no future in a sustainable society.

It is to be expected that companies will improve the efficiency, using the closed loop supply chain, and use it as a marketing tool. Pioneering firms have shown that this is possible (de Brito et.al, 2003). Third party service providers must consider which role they can play in this and which services are needed. Table 3 summarizes the business benefits.

To achieve business benefits, different business processes must be integrated. For example, product design for recovery and optimizing disposition requires R&D and Asset Recovery departments to collaborate.

Optimizing collection requires good collaboration between collecting companies, retailers and customers. In other words, collaboration is needed to realize business benefits, both economically and environmentally. Tying everything together we conclude that (i) the drivers enforcing closed-loop supply chains are economics, environmental impact and customer value; (ii) through the substitution effect these drivers will converge as environmental resources become more valuable and customer demand for recycling increases; (iii) service providers should offer 'green' supply chain services with economic viability and (iv) once the value of returns is acknowledged, supply chains partners must take responsibility voluntarily.

Key to success is close collaboration in the supply chain. How to build successful relationships in forward and reverse chain is therefore the subject of the next paragraph.

RELATIONSHIPS IN CLOSED-LOOP SUPPLY CHAINS

"For better and for worse". Isn't that the credo? But how do we maintain a successful relationship once the closed-loop marriage is a fact? As could be expected, there are no easy answers here but certainly some wise lessons to be taken into account.

First we must acknowledge that closed-loop supply chains add complexity. The number of players directly linked to the supply chain increases, with for instance waste collectors or repair firms. Clearly this is not a marriage of two parties, as the previous may suggest. A dozen parties need to march together. Second, the set of supply chain objectives, usually cost effectiveness and customer responsiveness, is extended with environmental goals. Third, new business processes must be developed and existing business processes must be adapted.

Customer Value	Economic Cost	Environmental
return service improves customer satisfaction	reduced liability risk	reduced energy use
reduce R&D time-to-market by modular redesign	regain value of materials and components	reduced material use
increased spare parts availability through early take back	regain value of labour avoid disposal costs	reduced emissions
improved product quality through re-engineering	reduced obsolescence through timely return	compliance with legislation
pro-active repairs	less new production	green image
brand loyalty after 'good' repair	spare parts returns reduction	

TABLE 3: BUSINESS BENEFITS OF CLOSED-LOOP SUPPLY CHAINS

Below we describe the roles of the partners involved, after which we elaborate on relationship management to achieve the complicated set of objectives.

R&D

Product designers increasingly pay attention to sustainability, in particular to green product design. They often apply Life Cycle Assessment (LCA), which aims to systematically evaluate the environmental impact of a product (or part/package) during its life cycle. LCA calculates indicators for the greenhouse effect, emissions, depletion of natural resources and so on. By definition, LCA only considers environmental issues and needs to be supported by economical models, e.g. on Life Cycle Costing. As mentioned, product modularity is a supply chain trend due to mass customization and CLSCs appear to be a natural extension. But designers must exploit this possibility. For recycling, materials used should be more homogeneous and less contaminated. Hazardous materials should be used as little as possible but foremost easily detectable and removable.

The measurement of eco impact is a complex matter, as is the relationship between green product design and closed-loop supply chains. However, results are promising. For instance,

Michelsen et al. (2005) evaluate six different product designs of furniture for different End-of-Life solutions.

Environmental impact is measured by extensive LCA based indicators. They show that (i) there is a strong relationship between product design and disposition choices, (ii) resulting small shifts of applied recovery options can lead to enormous environmental improvements at little or no cost.

SUPPLIERS

Because of their know-how first tier suppliers will play an increasing role in both green product design and the actual recovery process. These players are often involved in co-development. Suppliers however must be motivated to do so. Thierry et al (1995) introduce the supplier paradox; meaning that those who built sustainable parts and materials sell less because of extended life cycles. OEMs may compensate the loss of business by letting the suppliers do the repairs, making it profitable for both parties. Second tier suppliers should integrate material recycling into their production facilities whilst first tier suppliers ought to focus on remanufacturing. To put things in practice, LG has an extensive procedure for supplier selection putting strict requirements on sustainability and repair.



IT-SOFTWARE VENDORS

IT has several contributions to make to closed-loop supply chains. Following the product life cycle requires Product Data management (PDM). PDM serves to maintain accurate data on complex products, record maintenance changes on a product during its lifecycle and disseminate product data throughout the supply chain using supply chain information systems. Tracking and tracing for logistics purposes has great potential for easing control over the product acquisition and collection process. Klausner et al. (1998) report on a so-called green port (chip) implemented in Bosch power tools for EOL optimization.

Based on the monitoring of a few parameters during the products life time, a decision support system is capable of classifying returned cores into 'reusable' and 'scrap'. Moreover, illegal disposal practices are engaged by e.g. Japanese authorities using RFID technology. More main road IT involves using web orders instead of traditional ordering, call centers and electronic manuals to reduce return volumes. E-market places serve as trading platforms for reusable items. ERP-systems

are usually not geared for closed-loop applications. For example, the disassembly process requires a disassembly bill of material (dBOM), which is not the inverse of the regular BOM. It also requires matching algorithms to match recovered returns with demand in production. A lot of work is still to be done in this field.

SALES AGENTS/RETAIL

In B2B markets, companies are increasingly adopting business models selling the functionality; e.g. document processing at a cost per copy. The difference between 'new' and 'recovered' becomes less vital as long as the service is delivered. The business model allows more control over the product life cycle and eases creating 'secondary' market demand, but also requires more customer education. Service level agreements and extended warranties are tools that help to convince the customer to become green, but still special marketing campaigns may be necessary. In the service logistics process, recovered spares parts cannibalized from returns play an increasingly important role. As mentioned before this not only applies to capital goods. Also others have adapted their business model.



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Mail order companies have liberal return policies and henceforth fast and efficient returns processes. Within 48 hours returns are checked and returned to stock for a new sale. Kodak remanufactures (oh irony) single-use cameras and secures return volume via retail and laboratories who develop the film and print the photos for the customer; Guide and Van Wassenhove (2001).

Another aspect of the business model is creating alternative outlets. Estée Lauder dispositions returns to company stores and charity organizations. Always, there is the risk of competition between secondary and new markets. Therefore many companies prefer to break down returned items to the component or material level.

3RD PARTY SERVICE PROVIDERS (3PSPS)

This chair is sponsored by an association of 3rd party service providers.

With the current trend to outsource manufacturing, the question arises whether or not to outsource recovery activities. Our research shows that reverse logistics outsourcing arguments are no different from 'forward' ones: cost reduction, no core business and so on. However, what is different is that the type of 3rd party that is needed; specialized repair firms, recycling firms, suppliers and logistics service providers co-exist in this market. The type of 3rd party needed strongly depends on the recovery option (Tseng, 2006). It is to be expected that in the future customers will more and more need a full range of services.

The interesting question is whether 3PSPS will extend their services individually or setup alliances. At the same time a shake-out is to be expected in the independent networks of brokers and (small) recovery firms that currently take care of disposal and recycling of returns.

MANUFACTURERS

There is a key role for original equipment manufacturers for several reasons. First, the earlier mentioned extended producer responsibility or EPR. But most of all because OEMs own and direct large parts of the forward chain, which is after all the main reuse market. OEMs play a key role in green product design on the one hand and the disposition decision on the other hand. This includes outsourcing decisions, which in turn depend on the recovery option chosen. The coordination between product design, i.e. product modularity and material choices, and closed loop supply chains is critical. OEMs may set up joined facilities to share cost of disassembly and testing, since recovery activities are often seen as non-competitive. Design platforms have existed for years, for example in the automotive industry, to reduce cost. The resulting standardization of materials, parts and modules as well as production technology strongly favours closed-loop applications.

EXTERNAL STAKEHOLDERS (AND NETWORKS)

Both EPR-based directives and 'Basel-based' regulations regarding export and transportation of returns have a strong impact on closed-loop supply chains. In Europe, collective government approved recycling conglomerates are dominating the national markets, because they have the physical infrastructure and economies of scale but particularly can handle the complex monitoring and reporting need in view of environmental legislation. Auto Recycling Nederland (ARN) is one example of such a network for car recycling (www.arn.nl). Opponents of these systems are criticizing the lack of competition and high cost, as well as the strong national focus of each of these systems (Mayers, 2001).

Closed-loop supply chains are not the domain of tree-huggers. Nevertheless, also NGOs can have a severe impact. They often publish LCA studies and benchmark products and supply chains on their eco-footprint.

BUILDING AND MANAGING RELATIONSHIPS

There are many factors that influence successful relationships. Apart from 'rational' factors like mentioned above, much depends on trust and power. And related to that the degree of openness, transparency and reliability. One question is whether or not trust fosters sustainability. We have limited experience in this area, mainly based on supply chain management games in agri-food.

When producing cucumbers, coordinated decisions must be made between retailers, wholesalers and producers. When demand is low, overproduction must be avoided. However once started up, production cannot be stopped and products must be disposed of. Hard enough as it is to match supply and demand in the traditional sense (minimizing cost and maximizing customer service), adding environmental criteria

such as the carbon footprint and land-fill avoidance makes things even more complicated. Once trust is established, supply chain strategies must be adapted to deal with more complex trade-offs.

For example, lower delivery frequencies in larger batches reduce emissions but also may lower customer service and shelf life. Only close collaboration can ease tension, but trust is no guarantee for success but merely a requirement (Krikke et al., 2008).

In general, environmental concerns increase the number of processes, stakeholders and tensions to be dealt with in highly multilateral networks (Corbett and Klassen, 2006). As mentioned we are not talking about a marriage of forward and reverse chain, but about multiparty relationships. For 3rd parties it is a challenge to develop sophisticated services that improve efficiency and eco-footprint and to create sufficient trust between partners. **RLM**



Harold Krikke is a member of the Department of Organization and Strategy at the Tilburg University since 2004. He first studied Industrial Engineering and Management at Twente University of Technology in Enschede. At the same university he completed his Ph.D. in 1998 in the field of reverse logistics. Since then, he works as an assistant professor at Erasmus University Rotterdam and also as a business consultant at Tebodin consultants. As of 2002, he is a project manager of CentER Applied Research and later became Associate Professor at the faculty Economics and B.A. of Tilburg University.

As of April 2008, he is the RLA Professor of Closed Loop Supply Chain at the Open University Netherlands.

7th Annual RLA Conference & Expo Las Vegas

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The 7th Annual RLA Las Vegas Conference and Expo will be held on February 8-10, 2010 at the Rio Resort & Casino. Reverse Logistics Association is offering three full days of Reverse Logistics immersion starting with RLA Workshops and Industry Focus Committee meetings followed by two days of sessions and exhibition. Arrive early to have some fun before the conference starts on Monday, Super Bowl Sunday in Las Vegas – no other city generates as much excitement surrounding this all-American spectacle. Entertain your clients with the parties and celebrations at the Rio Resort & Casino.

The RLA conference kicks off on Monday with a number of activities including RL Workshops, RL Industry Focus Committee meetings and the opening of the Exhibit Hall. For those who like one-on-one time with their clients, join us at the RLA Golf Tournament.

Tuesday will start with an industry overview and forecast presented by RLA President, Gailen Vick. Afternoon sessions and panel discussions by RL professionals and leading academics will focus on cutting edge reverse logistics practices. Check the schedule available at www.RLASHows.com for session topics. The day concludes with roundtable discussions with each of the speakers. More sessions and panels will follow on Wednesday.

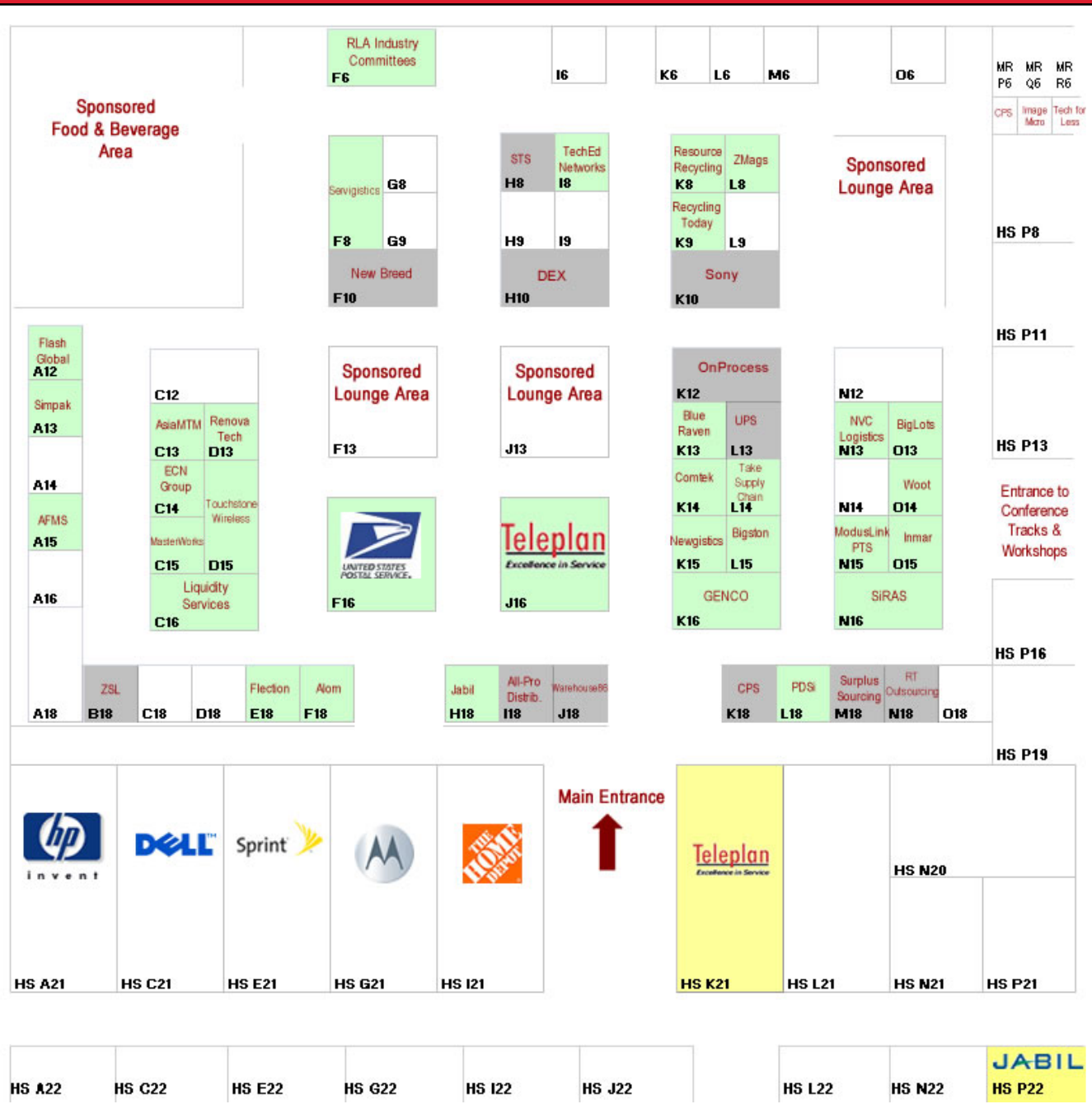
A wide range of leading global Reverse Logistics companies will be in attendance including: Home Depot, USPS, HP, Genco, Western Digital, Sprint Cisco and Dell.



Be sure to visit the Exhibition Hall where ODMs and OEMs will be looking for 3PSPs that can manage Reverse Logistics in the Americas, along with identifying solutions for Europe and the Far East. There will be many exhibitors showcasing their Reverse Logistics services and solutions. This is a rich opportunity for OEMs and Branded companies to identify future service partners. For more information and complete details, visit www.RLASHows.com.

2/7	RLA FOOTBALL PARTY - 3:00pm - 7:00pm							
2/8	5th RLA ANNUAL GOLF TOURNAMENT - SIENA GOLF CLUB - 8:00am - 1:00pm							
	WORKSHOPS - 8:00am - 3:30pm							
	Room 1	Room 2	Room 3	Room 4	Room 5	Room 6	Room 7	Room 8
	Gailen Vick, President, RLA	Michael Blumberg, President, Blumberg Advisory Group	Bradley Gross, Partner, Becker & Poliakoff	Jesse LaRose, President, ESE Solutions	Doug Pratt, Global RVL Manager, Iomega	Roy Steele, President, RoShar Associates, LLC	Steve Blaz, Consultant, Steve Blaz and Associates	Ron Kula, Consultant, Kula Consulting
8:00am	Successful Outsourcing RFQ's, Contracts and SOW's	Marketing & Selling Reverse Logistics Services	HELP! I Know What I Want, But How Do I Write It?	Leverage RL to Drive Sustainability and Reduce Expenses	Color Code Communications presentation "How to Use Personality to Sell Your Message"	Service Parts Inventory Optimization: Pt. 1, Pre-Product Launch	Secrets revealed from your Supply Chain and why Margaritas matter	How to effectively design and implement an End of Service life (EOSL) strategy
	BREAK - 10:00 - 10:30am							
10:30am	What OEMs and 3PSPs Need to Consider When Assembling a RFQ Proposal or Response	Best Practices & Benchmarks in Reverse Logistics	HELP! I Know What I Want, But How Do I Write It?	Leverage RL to Drive Sustainability and Reduce Expenses	Color Code Communications presentation "How to Use Personality to Sell Your Message"	Service Parts Inventory Optimization: Pt. 2 Post Product Launch	Secrets revealed from your Supply Chain and why Margaritas matter	How to effectively design and implement an End of Service life (EOSL) strategy
	LUNCH - 12:30 - 1:30pm							
1:30pm	Successful Outsourcing RFQ's, Contracts and SOW's	Marketing & Selling Reverse Logistics Services	HELP! I Know What I Want, But How Do I Write It?	Leverage RL to Drive Sustainability and Reduce Expenses	Color Code Communications presentation "How to Use Personality to Sell Your Message"	Service Parts Inventory Optimization: Pt. 2 Post Product Launch	Secrets revealed from your Supply Chain and why Margaritas matter	How to effectively design and implement an End of Service life (EOSL) strategy
	EXHIBIT HALL OPENS - 1:00pm							
	RLA INDUSTRY COMMITTEES - 3:30pm							
	Track A	Track B	Track C	Track D	Track E			
3:30pm	Consumer Electronics Committee	Information Technology Solutions Committee	Wireless Committee	Data Storage Committee	Sustainability			
4:30pm	Spare Parts Committee	Food & Beverage Committee	India Focus Committee	Standards Committee				
	EXHIBITOR, SPONSOR & SPEAKER RECEPTION - EXHIBIT HALL - 6:00pm - 9:00pm							
2/9	CONTINENTAL BREAKFAST - EXHIBIT HALL - 8:00am							
	INTRODUCTION - Gailen Vick, President, RLA - 10:00am							
	KEYNOTE ADDRESS - Mark Twaalfhoven, President, Valuec BV - 10:30am							
	BUFFET LUNCH - EXHIBIT HALL - 11:30am - 12:30pm							
	Track A	Track B	Track C	Track D	Track E	Track F		
12:30pm	Michael R. Blumberg - President Blumberg Advisory Group Service Supply Chain Challenges and Best Practices for High Value and Long Life Cycle Requirement	Remanufacturing and its Challenges	Chris Griffin - Sr. Manager Wireless Industry Repair Services & Reverse Logistics, Sprint Wireless Industry Repair Services & Reverse Logistics	Edward Higgins - Vice President, Masterworks International Measuring Success in Outsourced Reverse Supply Chain Solutions	Repair and Asset Recovery to Support Leased PC	Sales Lifecycle Product Tracking - Retailer Return Prevention Solutions		

	Track A	Track B	Track C	Track D	Track E	Track F
1:30pm	Steve Brown - HP Ken Ueltzen - Comtek Minimizing Service Parts Expense by Coupling Your Repair Strategy With an Alternate Sourcing Strategy	Craig Sultan - Sr Manager Reverse Logistics, The Home Depot Customer Satisfaction through Returns Voice of the Customer	Joseph Walden - Executive Director, U.S. Army Panel: Wireless Carriers / OEM & 3PSP Customer Support	James Cochrane - VP, Ground Shipping, USPS New Ways to Use Returns to Bring in Profit While Greening your Business	Developing a Set of RL "Business Rules"	Reverse Logistics Issues in the Data Storage Industry
	AFTERNOON BREAK - 1:30pm - 2:30pm					
3:30pm	Greg Hazlett - Principal, Tompkins Associates Panel: Creating a Customer Centric Reverse Supply Chain Strategy	Matt Snyder - Senior Manager, Dell Remanufacturing Outsourcing	Bernie Schaeffer - CVP Post Sales Support, Motorola Mobile Devices Business Consumer Self Service - Prevention is the Best Medicine	Bradley Gross - Attorney at Law, Becker & Poliakoff Stay Out of Court! Drafting the Perfect RL Agreement	Steve Blaz - Consultant, Steve Blaz and Associates Panel: RL & Emerging Markets - Securing your Supply Chain into & out of Brazil	Universal Model for Reverse Logistics IT
4:30pm	Roy Steele - President Panel: Service Parts Management	Roger Rowley - Service Manager, Samsung Reverse Logistics with the CE Environment	Shrinking the RL Pipeline: How to Reduce the Flow of Product	Dick Kluis - VP, Product Management, Servigistics The Impact of "Conditional Awareness" on your Service Network	Integration Delivers Value Beyond Repair	Integration of RL Processes & Systems
	EVENING RECEPTION - 5:30pm - 8:00pm					
2/10	Track A	Track B	Track C	Track D	Track E	Track F
	CONTINENTAL BREAKFAST - EXHIBIT HALL - 8:00am					
	KEYNOTE ADDRESS - William Pollock, VP/Principal Analyst, Aberdeen Group - 8:30am					
	MORNING BREAK - 9:30am - 10:30am					
10:30am	Tony Sciarrotta - Director, Asset Recovery, Philips Consumer Lifestyle Panel: Asset Recovery and Returns Management Processes	Gary Reblin - VP, Expedited Shipping, USPS Bringing Expedited Shipping to New Levels	Seshagiri Singaraju - Materials Manager, Sun Microsystems Inc. Achieving Velocity In Reverse Supply Chain Operations	Sanjeev Kakar - Director, RT Outsourcing Service Limited Reducing Total-Cost-of-Services	Reverse Flow From A Retailer's Perspective.	RL Quote, Research and Consultants Co-op
11:30am	Greening Your Mail Panel:	Thomas Stanton - International Analyst/Licensed Customs Broker International Returns	Cayce Roy - EVP & President, Liquidity Services Inc. Using a Multi-Channel Reverse Supply Chain Strategy to Thrive in a Down Economy	Haymon Keeler - Bus Dev Mgr, ECN Group Returns Software	Sustainability and Corporate Social Responsibility in Environmental Management	Leslie Harms - Director of Registration Membership Relations RLA Maximize Your RLA Membership Benefits
	BUFFET LUNCH - EXHIBIT HALL - 12:30pm - 1:30pm					
1:30pm	Jesse LaRose - President, ESE Solutions Panel: RL Best Practices: Reducing Expenses through Green Initiatives	Mark Servidio - VP-Environmental Supply Chain, Sharp Environmental Supply Chain	Creating Value from Returns - The Design of Service Networks	Stephen Fraser - President & CEO, Genco Recessionary Impact on the Reverse Supply Chain and Some Best Practice Considerations	Reverse Logistics as an Asset	Maximizing Opportunities From Managing Sustainability Risk
2:30pm	Steve Blaz - Consultant, Steve Blaz and Associates Panel: What is "Best in Class" to you ?	Mary Wells - Emerging Markets Repair Manager, Sun Microsystems Using a Multi-Channel Reverse Supply Chain Strategy to Thrive in a Down Economy	Global Warranty Support	Hannah Kain - President & CEO, ALOM Before You Outsource: 5 Secrets That Your RL Provider Does Not Want You To Know	Reverse Logistics: It's Not a Challenge, It's an Opportunity	Reverse Logistics Mobile Visibility
	Closing Remarks - Leslie Harms, RLA - 3:30pm					
	Lucky Draw - Lyndsey Turner, RLA - 4:30pm					



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Enterprise Reverse Logistics Adds Up to Many Happy Returns for Philips

With an innovative web-based ERL solution, Philips now has a more effective and cost-efficient method for handling returned goods... Note: Roger Rowley recently left his position at Philips and now works as the Service Manager for Samsung, New Zealand.

Returns cost us hundreds of thousands of dollars each year," says Roger Rowley, operations manager, Philips Consumer Lifestyle, Philips New Zealand Ltd.

"And that's just for the logistics, and doesn't include the cost of any subsequent repair and margin loss as a result of scrapping or selling the product as a second. Most of those costs are in labour associated with processing returns and related transport. With numbers like these, reverse logistics, the art and science of aftermarket customer services, has been a major focus for us as we look to reduce costs and increase efficiencies," Rowley adds.

"So when ECN approached us with the opportunity to implement ECN ERL (Enterprise Reverse Logistics) with their innovative web-based

goods return authorization (GRA) business process management tool, we jumped at the chance."

Philips rolled out ERL to more than 100 Noel Leeming and Bond & Bond retail outlets in November 2008 and have already seen significant improvements. "Telephone and email GRA requests to our internal call centre have virtually disappeared – and this is normally the busiest time of the year," says Rowley.

"What was once a significant part of our call centre activity has been eliminated, as staff at Noel Leeming and Bond & Bond can now obtain on-line authorisation for a return – ERL arranges transport and provides authorization numbers on the spot – without any intervention on our part," he says.

"And because ERL prompts them for all of the information that is required before they can conclude the GRA transaction, the accuracy of the GRA forms is now approaching 100%."

"Expected savings as a result of implementing ERL would be over \$100,000 per year."

SIMPLIFYING RETURN PROCEDURES

Even though Philips has a very well-developed GRA policy, ensuring that everyone involved in the reverse logistics chain, followed it to the letter, was problematic.

"The policies were all spelled out but keeping all parties trained and up-to-date with the procedures is both time consuming and expensive," explains Rowley. "With the large number



of stores and staff, updating paper policy manuals is always a logistical headache."

"With ERL, the system prompts the retail returns clerk for all of the pertinent information and won't allow them to proceed until all fields are filled in correctly.

There is even a drop-down menu with a series of questions designed to trouble shoot common problems that are a result of improper installation or operation," he says.

"This should help reduce 'no fault founds.' With ERL, even a temporary staff member can handle a complex returns operation with minimal training and look like a professional while they do it.

- Customers are happy as the decision making process is immediate
- Staff are happy because ERL minimises the time they have to spend on returns activities, which means more time being able to sell!

- The retailer is happy as it means that any credit due is processed and applied to their account much faster
- We are happy because we are lowering our costs and increasing our efficiencies.

Implementing ERL was "a piece of cake," according to Rowley. "We were able to translate our business rules into ERL quickly and easily. Because our policies were so well documented to begin with, all we had to do was replicate the procedures into a set of easy to understand steps that even a temporary clerk could follow," he says.



"Because ERL is web-based, we can make any changes – such as adding a new product or modifying a particular procedure – from the centralised console and roll them out immediately to all branches. Before ERL, making changes was a long, drawn out process. Now, it is almost instantaneous."

MAKING THE JOB EASIER

"Today's retail staffs are more tech savvy and so are more at home in



Boosting Service Quality and Customer Satisfaction through Warranty Analytics

by Varun Madhok and John Dillender

MONEY TALKS

Regeneris acquires Total Repair Solutions Holdings

Regeneris plc, a provider of after sales product support services to technology brands, has acquired Total Repair Solutions Holdings Limited (TRS). Both the companies are based in the UK.

TRS is a provider of repair, returns management, and end-of-life recycling services for mobile phones.

Hewlett-Packard to Buy 3Com for \$2.7B

Hewlett-Packard Co., looking to expand into a business long dominated by Cisco, said Wednesday it has agreed to buy networking software and equipment maker 3Com Corp. in a deal the companies valued at \$2.7 billion.

HP also issued a preliminary report for the three months that ended in October, saying it earned 99 cents per share, compared with 84 cents in the year-ago period.

DecisionOne Signs Services Agreement With Allscripts

DecisionOne, a leading provider of technology support services to the healthcare industry, recently announced an agreement with Allscripts, the leader in software, services, information, and connectivity solutions for physicians and hospitals, for DecisionOne to assume the responsibility for the maintenance of the hardware infrastructure of thousands of Allscripts clients nationwide.

Under the terms of the agreement, DecisionOne will integrate Allscripts internal hardware service personnel into its highly credentialed and comprehensive national field service organization. This partnership enhances Allscripts ability to maintain industry-leading service levels while the company prepares to meet the emerging demand for Electronic Health Records in the wake of the American Recovery and Reinvestment Act (ARRA) of 2009.



to this acceptance was getting NLG involved in the design stage to provide their inputs from the retail perspective.

“We’ve been very impressed with the way ERL has worked for us and strongly believe that ERL will have a great future in the reverse logistics environment.”

Returns are a fact of life for retailers. For any business offering a returns policy on products, ERL can start paying for itself in reduced costs almost immediately as has been the case at Philips.

ERL is set up so that it can quickly integrate returns policies and procedures into the system and populate the database with all the product details. Often different products require different procedures – such as a particular repair depot for selected models – ERL can automatically select the most appropriate action.

ERL is set up using standard business process methodologies and so can be easily integrated with finance or ERP packages.

Once ERL is up and running, the challenge of training retail staff is covered. Online training is available that can have even a temporary returns clerk interacting with customers like a pro within just a short time of self-paced instruction.

Procedure modification (such as changing the Warranty period or procedure on a product), can be rolled out to the retail outlets nationwide with a single click.

For more information regarding Enterprize Reverse Logistics, please visit: www.ecnerl.com



front of a screen rather than with a heavy, paper based policy manual that covers multiple suppliers,” concludes Rowley.

“We have had unanimous acceptance from the staff on the front line at Noel Leeming and Bond & Bond stores to using ERL. In fact, it makes their jobs much easier as the customers are usually pleasantly surprised at the professionalism that ERL encourages,” he says. Critical

Warranty data is a valuable source of information to the services function of a manufacturer. The services team establishes the metrics and takes measurements off warranty data to understand the current state of the operation. In this article we focus on warranty analytics as used for cutting the lost costs in services delivery. There are two opportunity areas discussed – service network monitoring and product quality tracking. For each, we present the business case for the loss mitigation initiative and list the specific tools a manufacturer must use to get the desired insights.

SERVICE NETWORK MONITORING: FRAUD AND ABUSE MITIGATION

Despite the strong business case for fraud mitigation, most companies

choose to ignore warranty fraud, considering it as an acceptable part of doing business¹. One of the reasons for this is that the service channel is often also a sales arm, and companies are hesitant to come down hard on questionable warranty claims in spite of the impact on customers. A “customers first” approach benefits the complete value chain - from the manufacturer to the customer. In an interview¹, loss prevention consultant R. Schmedlen has this to say, “... in a Newfoundland case, the dealer (who was not part of the fraud — one of his managers was stealing products and covering the losses with fake adjustments) reported that he had excellent feedback from his customers and that his sales of the product in question increased substantially in the following months.”

Service network abuse of the warranty process happens in multiple ways.

The service person can fake claims or claimants, can overcharge the manufacturer on the rendered services, or just not provide adequate service to the end-consumer. This hurts a company in multiple ways. There is the subversion of the product failure metrics of course, but the hardest hit is to the bottom line by way of part costs, call center charges, service charges and other reverse logistics expenses. Industry estimates suggest that for every \$1.00 lost to an improper claim, the cost to the manufacturer can be as high as \$6.00² that is a direct hit on the retained income.

Given the volume of loss a services operation cannot afford to not take action or to not continuously adapt over time. Service providers who are inclined to abuse, keep looking for ways to cheat the system. The audit

processes need to stay current and keep looking for inconsistent patterns in the claims behavior. A formal audit process needs an analytical data mart for storing and processing the raw claims data and the supporting parts information. A decision support engine is built on top of the data mart to identify unusual claims patterns. Most manufacturers have the basic processes and technology to ensure that part claims are consistent with products under warranty. However, service network abuse does not necessarily show up in individual claim scans. Data have to be looked at in aggregate and a very useful algorithm for this type of analysis is derived off a scientific discipline known as fuzzy logic³.

Here are some basic tactics that can be useful as part of the initial audit:

- Monitor the replacement of components that have high value on the gray market, e.g. SIMM chips for electronic component manufacturers.
- Compare the sales numbers for a given dealer-repair store relative to the claims filed.
- If the service channel also handles out of warranty calls, review in-warranty claims dated on or around the warranty expiration date for instances of backdating.
- Review the number of part replacements on warranty claims and monitor for unusual part combination replacements.

Fuzzy logic is used in detecting the deviations in service center behavior from the norm. This is distinct and superior to basic rule-based decision support. For example, it is not sufficient

to put in a rule that any service center replacing more than 200 widgets a week is suspicious. Fraudsters learn to fly under the radar. Alternately changes to product quality can quickly render the rules useless. Fuzzy logic institutes soft' rules wherein the service center is scored on a graded scale as per the level of suspicion relative to its peers. So a service center is considered suspicious when it is replacing 'too many' widgets compared to other service centers. This technique is self-adaptive. Fuzzy logic based decision support adapts to the changing environment and adjusts the suspicion levels accordingly.

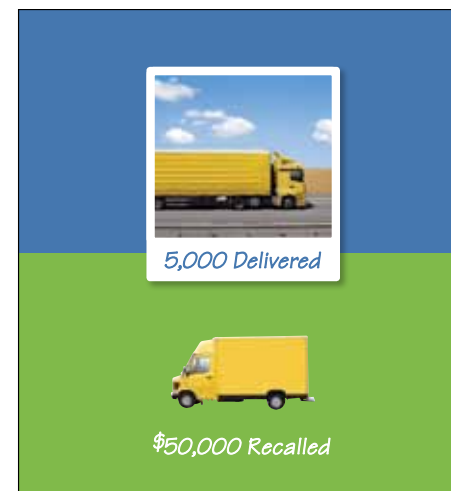
PRODUCT QUALITY TRACKING: ROOT CAUSE ANALYSIS

Industry reports suggest that because the dealers replace the problematic part rather than repair it, the cost of component failure during a warranty period can be up to ten times the supplier's unit price⁴. Consequently, a focus on identifying the root cause of product failures and correcting the systemic problems can yield tremendous benefit to the bottom line.

Pattern analysis of warranty data can identify such cost savings tactics. The primary challenge is the high volume of data and the enormous number of component combinations and the product failure. The technology for running this analysis efficiently is based on an algorithm known as Association Analysis⁵. As the name suggests, the analysis looks for relationships between the attributes of the product — such as usage, production date, model type, model environment, part replacement history — and the occurrence of a specific type of part replacement or of service labor.

An extension of Association Analysis is the algorithm known as Sequential Pattern Analysis. This algorithm adds the dimension of time to the analysis. Thus, the analysts can find not only the correlation between the production month for a specific model and the component failure, they can also detect if this component failure is associated with other component replacements within the next few months. These patterns of product failure identify fundamental problems in the product, the failure diagnoses, or the service quality.

The discoveries of this type of analysis identify the correlation but do not necessarily imply a causal relationship between the product attributes and the failure. However, in practice, these discoveries often lead to significant cost-cutting opportunities. With one



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company where management focused on auditing the reverse logistics process, it was discovered that up to 40% of items returned through the call center process had no defects. Further analysis discovered that the high return rate was due to the customers being unable to understand the manuals that accompanied the products and the call center being unable to handle the complaints. Once the company made the diagnosis it was able to reduce the costs for the repair depot by up to 10% in the first year.

NEXT STEPS

Management commitment is needed to ensure warranty data are collected, processed and used in managing the service network and product quality as discussed above. Resources and budget need to be allocated to such forward looking initiatives. The costs of not taking action 1,4 far exceed the costs of these initiatives.

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up to 40% of items returned through the call center process had no defects



Varun Madhok heads the Client Services team for Infernotions Technologies' ClaimsGator offering.

He is responsible for understanding the client requirements, managing solution delivery, and ultimately ensuring that the clients realize the costs savings committed by ClaimsGator. Prior to this role, Varun has consulted to multiple clients in the distribution, industrial and financial sector in the capacity of a consultant to optimize their business processes using a toolkit comprising advanced analytical solutions. Varun holds a Ph.D. in Electrical Engineering from Purdue University and can be reached at varun@claimsgator.com or via www.claimsgator.com.



John Dillender is an executive consultant on Infernotions' client services team with a

focus on the consumer electronics industry. He has over 30 years' domestic and international experience in high technology, outsourcing and manufacturing support services. His expertise, gained while working in multinational corporate environments, is focused on team building and maximizing operational efficiencies.

Through 2006, John served as Vice President of Service & Support for Epson America, Inc. with responsibility for over 600 employees in the US, Canada and Latin America. He implemented strategies resulting in cost reductions of more than \$20 million over his four year term as Vice President. John can be reached at JDillender@JDillender-Assoc.com.



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Amsterdam, The Netherlands
Venue:
Dorint Amsterdam Airport Hotel
Date:
Workshops - June 15, 2010
Conference & Expo - June 15-17, 2010



Reverse Logistics Association is offering three full days of RL immersion starting with RL Workshops and Focus Committee Discussions followed by two days of sessions and exhibition.

Workshops are offered on Tuesday, June 15 on a variety of topics including Best Practices: Lean Repair and Reverse Logistics Trends and Eco-Efficiency.

The Reverse Logistics Association Conference & Expo kicks off on Wednesday with the Keynote address followed by sessions presented by RL professionals, leading academics and also includes panel discussions. Session topics include "Customers Give the Best Insights into After-Sales Effectiveness, Using Technology to Enable Collaborative Independence and Designing an Integrated Reverse Logistics and Service Support Network". A wide range of Reverse Logistics companies will be in attendance from repair/refurbishing to recycling/e-waste and transportation logistics.

Be sure to visit the Exhibition Hall where ODMs and OEMs will be looking for Third Party Service Providers (3PSPs) that can manage Reverse Logistics in Europe, along with identifying solutions for Asia and the Americas. There will be many exhibitors showcasing their Reverse Logistics services and solutions. This is a rich opportunity for OEMs and Branded companies to identify future service partners.

For more information, visit: www.RLShows.com



Reduce Capital Costs by Performance-based Contracts

by Jürgen Donders

Capital assets require large investments and therefore depreciation costs during their useful life. In addition, costs of maintenance and spare parts are significant. All these costs over the life cycle are part of the Total Cost of Ownership (TCO).

Between OEMs on the one side and operators on the other side, there is (still) a virulent conflict and therefore operators are confronted with too high costs. The perception of huge margins made on sales of spare parts is an example for that. Because of the apparent trend in which operators increasingly ask for so-called 'Performance Based contracts,' there is movement in the existing situation. In 'Performance Based contracts,' spare parts are no longer sold, but are one of the costs in maintaining the capital asset by a service provider (OEM or a third party). OEMs and sometimes even operators, see 'Performance Based contracts' often as a threat, while in fact there is a logical win-win situation.

This article shows the opportunities that exist for both OEMs and operators.

CONFLICTING INTERESTS

Figure 1 below shows the contradiction between OEMs on the one side and operators of capital-intensive goods on the other.

OEMs strive for a low initial sales price and possibly for a not very reliable product. After all, there must be many years with a certain amount of after sales support, including spare parts, sold with high margins. Operators however, strive for low TCO. Investing more in the design, a higher initial purchase price as a result, will often lead to lower TCO by a reduced need for after sales support and spare parts.

In recent years, operators are more and more concerned with reducing the TCO of their capital in the operational phase. Although the largest amount of TCO is actually made during the operational

phase of a capital asset, the size of this amount is already determined during the design phase. Figure 2 makes this clear.

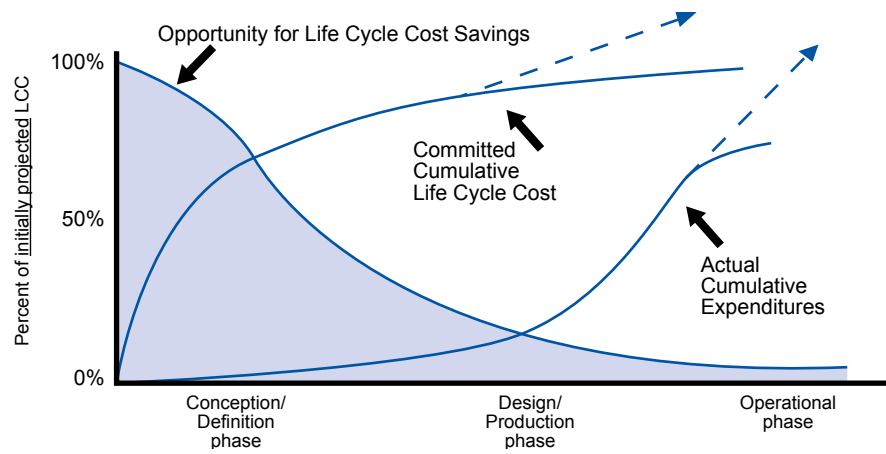
When an operator starts projects to reduce the TCO of a capital asset in its operational phase, the potential savings to be found are very minimal. For the TCO to be really low, this must already be taken into account in the design phase.

Here we find a difficult contrast. The design is carried out by the OEM. The question is to what extent the OEM benefits from low TCO. If operators actually base their purchasing decisions on TCO, the OEM may be inclined to pursue this low TCO. In many cases however, there is an operator that is guided by a budget that is available for initial purchase. In these situations, an OEM therefore benefits by keeping initial development costs at a low level (which in fact provides a low initial sales price). An OEM also benefits



FIGURE 1

FIGURE 2



from a design that is not so perfect, by selling more after sales support and spare parts in the future.

PERFORMANCE BASED CONTRACT

Since operators are increasingly unwilling to invest in capital-intensive goods and maintain these themselves, there is an increasing need for results-based contracts in which an operator only pays to OEMs in proportion to the actual production delivered. For example, Rolls Royce delivers aircraft engines to airlines, which are only paid in proportion to the number of operating hours of the engine (Power by the hour contracts). In this situation, Rolls Royce itself has become responsible for maintenance, spare parts and asset management of its engines in use by its customers (airlines).

Because airlines now lease an engine based on a low hourly rate (of course given a certain confidence), the OEM is motivated more than before to achieve low TCO. In this way, achieving low TCO and the design are in one hand, where most can be done to influence

the TCO. The OEM now benefits from a robust, reliable and low maintenance product with a low demand for spare parts that are as cheap as possible. The initial design costs go up, in favour of lower maintenance costs over many years and (thus) low TCO.

OPPORTUNITIES AND THREATS

If this is all so obvious and easy, why does Performance Based contracting not yet grow very rapidly in popularity? Table 1 provides greater insight.

It is mainly the above-mentioned threats why OEMs and operators in many cases still are reluctant to move to performance based contracting. However, if all this above is taken into consideration, the reliability of capital goods will be greatly improved and TCO significantly reduced. The huge savings can be shared in a win-win structure between the OEM and operators. The OEM gets more business that generates more revenue while at the same time he gets to know its own capital goods better and better. The operator on the other hand can fully concentrate on its core business and is

in a position to produce his products or services at much lower costs.

'LIFE CYCLE ORIENTED DESIGN OF CAPITAL GOODS'

Under the auspices of the Dutch Ministry of Economical Affairs, there is currently a research project for "Life cycle oriented design of capital goods." This is a project carried out by the Technical Universities of Eindhoven and Twente in cooperation with the companies Thales, Panalytical, Philips Healthcare and VanderLande Industries. In the current research, the focus is on reliability engineering and integration of the level of repair analysis with spares requirements calculations.

The author is chairman of the supervisory committee of the project, which includes, besides the above mentioned companies, also Stork PMT, Alstom Transport, Nedtrain, Wärtsilä, Defense and IHC.



Jürgen Donders (1969) is managing consultant at Gordian Logistic Experts. Gordian is a consultancy firm with a focus on service logistics. He was Squadron Commander of the 921 Logistics

Squadron of Airbase Leeuwarden (F-16 Fighter base). Further he was responsible for air force logistics in the United Nations Mission in Ethiopia and Eritrea (UNMEE). After his air force assignment he was manager of the Logistics Engineering department at Thales Netherlands, Jürgen member of the spare parts management focus committee.

TABLE 1

	OEM	Operator
Opportunities	Extend the product portfolio with full service for its systems (more value added activities, more business)	Focus on core business, lower TCD
Threats	High initial costs, loss of lucrative aftermarket (spare parts) business	Loss of maintenance organization, increased dependence on third parties.

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LET GO!

Your organizational and institutional systems are evolving faster than your ability to control them

by Joseph Karcher

SIMPLY PUT, CONTROLS WILL EVENTUALLY EXPIRE OR CONSPIRE AGAINST THE THING THAT WE EXPECT TO EVOLVE.

Metaphorically speaking, a reverse Logistics professional is a like river; adapting, changing, wiggling, struggling and repeating the cycle. We find our way through difficult passes. Unfortunately, establishing a pattern of knowing what is breaking and when it is breaking can be...an obsession. We want to grasp the variables throughout our systems yet the variables ebb and flow into and out of each other, not always as planned.

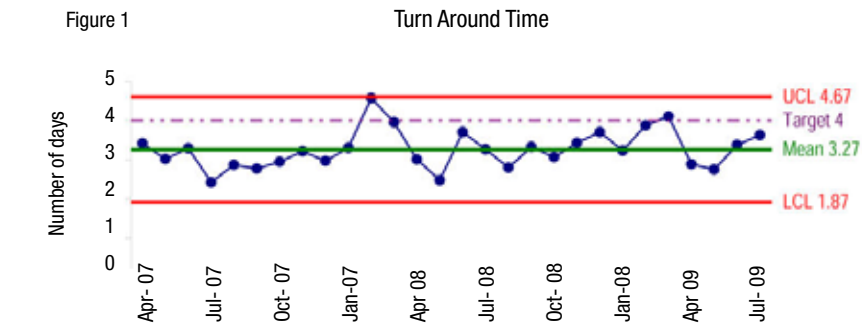
Margaret J. Wheatley's book *Leadership and the New Science* (2006), delivers a keen awareness of larger systems at work which trumps our ideas of what we can see and test. She writes, "As the system changes and evolves it also affects its environment. No participant in this dance is left unaffected by changes that occur in another". We can break down our systems into discrete parts but

should not expect that they will make sense for very long. This is counterintuitive to some of the six-sigma control training, finding the critical inflection or break points and then solving them, for good. Simply put, controls will eventually expire or conspire against the thing that we expect to evolve. It is possible to over-control a process, unknowingly restraining its growth and evolution, hastening its demise.

Let's look at a standard control chart used by a repair depot or logistics manager (figure 1). If one assumes that the process has been fully defined, analyzed, improved, controlled and is showing signs of stability or improvement, why tinker with it? Why look at it again until it starts to grow statistically out-of-control. The math doesn't lie because the data is operating in an optimal control range. Scientifically speaking,

the data is saying we are okay. Perhaps a secondary metric also shows stability so we can posit that the processes are running smoothly. Yet what is going on under the surface? What other "participants in the dance" remain unseen?

There are invisible and undiscovered systems pressing on and assisting our processes. The interconnectedness of systems, instruments, lives, voices, environments, egos, cultures should raise our awareness that we should consider letting go of our preconceived notions about how the future will look. These things transcend our ability to sample, control and even stretch beyond our senses to see and hear. There is remedy that is available. It is possible to bring some level of clarity to the invisible and as yet undiscovered systems. The remedy is holistic as we have stated one can never know for



sure that they see all things as they really are.

Pentimento! This is an appropriate Italian word for describing what we can do. You see, pentirsi means-to repent. The word is commonly used in reference to artistic works as an artist changes his or her mind in a particular work. During the process of painting, sculpting, creating, the artist decides to change the process and the final work leaves subtle traces or layers of the original work so that we can understand the piece.

Often times it takes very close inspection, even X-ray to reveal important elements of artwork that have been hidden for centuries. So in a sense we are more than scientists in the field of Reverse Logistics. We are also artists. See and see again. This should be our mantra. As we use six sigma and lean tools we may be surprised or perhaps shocked to find out that a process, thought to be highly controlled, has broken down. An undiscovered variable has mutated, combined with other elements and the needle on our measuring system has not moved.

Why do processes and controls expire? There is no easy answer to the question except to say that from a long term conceptual perspective, better methods always come along that deliver more optimal results. Think of Moore's Law for a moment. You may recall the Cal Tech professor theorized in the early 1970s the doubling of integrated circuit capacity every two years. The acceleration of change relative to computing is significant important

in our computer industry as process speeds, memory capacity, pixel ratio capacity affect computing products and digital networks.

As is the case in the study of technology, measuring systems and even educational acumen continues to expand at exponential rates in the age of web 2.0; we will continue to face serious challenges to our processes. Has your operational eco-system mutated faster than your ability to control it? Are you willing to admit to the fact that there is a vast interconnectedness of things you as a scientist cannot control that can destroy even the best process? Is it possible for you to comfortably embrace the idea of the artist, using Pentimento, being a river, adapting, asking more of a process that seems to be operating perfectly. This is the true test of management and ultimately our leadership stewardship of the important processes we try to control.



Joseph Karcher is the Director of Reverse Logistics at Toshiba America Information Systems in Irvine

California. He has over 20 years of extensive leadership experience in Supply Chain and Reverse Logistics and understands the forces shaping the market: globalization, social responsibility, and business strategy and information systems. Joe holds a Masters Degree in Organizational leadership from Gonzaga University.



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Avoiding the Pitfalls of International Returns

by Tom Stanton



Too often when people export merchandise to a foreign company, preparing for a return of the merchandise or a component of the product is the “farthest thing from their mind.” However, if the merchandise is damaged or somewhat different from what the customer expected, the product could be coming back. Or perhaps shipments to the destination country are only allowed through an intermediary country. For example, a shipment might get stuck in Malaysia because it had not gone through Customs in Singapore first! Perhaps, the item was shipped via a small package carrier and the end user country does not allow products of this value to be shipped via small package. A customs broker, an import bond and an import license were all brought into the picture. For whatever the reason, your shipment could be held by the Customs authorities in the destination country or the United States and you would like your valued item back. So what do you do? In order to make things more clear let’s address a basic question: “Why do Customs officers and Custom brokers exist?”

That is an important question which is at the root of why your goods may have been returned or are being held by Customs. Why are shipments made between two countries so different from

shipments within the United States? The difference is simply because of “protectionism” or protecting your own industries. Without a US Customs and Border Protection Service agency reviewing import shipments, another country could wreak economic havoc in our industries by simply selling goods at a much lower price than we could make them. That would not be particularly bad except if the items we were importing were essential to our survival. For example, the Japanese charge a duty or tariff on imported rice from California because they want to protect production of rice in Japan. They do not expect to ever be dependent on another country for rice which is essential to their diet! So it sounds like this idea of a Customs Service and duties might have been around for while, right? You are so right! Let’s find out how long it has been around!

THE HISTORY

The First Congress passed and President George Washington signed into law, the Tariff Act of July 4, 1789. This act authorized the collection of duties, or fees, on imported goods. Points of entry were determined shortly after, and people — citizens and visitors — entering the U.S. began to be accountable for what they brought

with them. For more than a century, before the IRS was in existence, U.S. Customs supported almost the entire government and its infrastructure.

Customs revenues were used to build the City of Washington, D.C., many of the nation’s lighthouses and U.S. military and naval academies. The U.S. Customs Service is said to have spawned other government agencies, including the Bureau of Census, the Department of Veterans Affairs, the U.S. Coast Guard and the National Institute of Standards and Technology.

In response to the bombing of the World Trade Center In March of 2003, various agencies combined to make things more efficient. The U.S. Customs Service became U.S. Customs and Border Protection, an agency of the Department of Homeland Security.

TODAY

Today U.S. Customs and Border Protection (CBP) is responsible for ensuring that all imports and exports comply with U.S. laws and regulations, and for collecting revenues associated with the enforcement of those laws. The agency seizes illegal drugs and

narcotics and arrests people engaged in smuggling or other fraudulent behavior with the intent to get around Customs laws; “processes” people, luggage, cargo and mail; protects U.S. business and intellectual property rights; enforces laws against money laundering; restricts the export of data essential to the production of mass weapons of warfare in conjunction with the US Commerce Department and the US Department of State; gathers import and export data for the purpose of compiling international trade statistics; and enforces laws for as many as forty other agencies.

CBP has extensive air, land and marine resources—including state-of-the-art helicopters and jets-for enforcing laws, as well as its own intelligence branch. The Customs Service also has a canine corps for sniffing out drugs and other illegal substances. They also deal with drug smuggling, child pornography and help control the export of technology that could be used by foreign military against the U.S. Another major area of investigation is commercial fraud such as declaring goods to be of Mexican origin and duty free rather than Chinese origin and dutiable.

CBP relies increasingly on high technology enforcement and administrative technology. It is still the second largest revenue source for the federal government—the Internal Revenue Service is number one. So why does US Customs and Border Service exist? It exists to protect United States industry borders and to control exports for a number of reasons named above.

INSPECTORS AND IMPORT SPECIALISTS

Besides the specialized intelligence enforcement by Customs, there of two major teams working in CBP. One team consists of inspectors for daily review of shipments. These are the Customs officers that you are used to seeing. A second team of Customs people are called “import specialists or commodity specialists.” These are highly trained

and technically proficient individuals who review the accuracy of import documentation on all shipments valued over \$2,000 or “formal entries.” They generally specialize in the classification and value of a particular group of commodities, depending upon the volume handled by a particular port.

CUSTOMS BROKERS

In the past, when cargo arrived by vessel from a foreign country, the cargo arrived in wooden casks or crates that were opened by men called “brokers.” In today’s world, a US Customs broker is licensed after taking and passing a test on Title 19 of the Code of Federal Regulations and the Harmonized Tariff Schedules of the US, administered by the CBP. The broker’s main reason for existence today is to assist the importer in compliance with the law and communicating with CBP. In order for imported goods valued over \$2,000 (formal entry) to be released promptly from Customs, they must be covered by an import bond. Insurance companies sell bonds through customs brokers in many instances because shipments cleared by brokers are less likely to incur penalties or requests for return of the merchandise. These situations would make the insurance company responsible to pay duties, taxes or penalties if the importer was out of the country or did not respond to CBP.

CONCLUSIONS

So, finally we have developed the picture a bit. CBP exists to protect US commerce and brokers exist to make Customs clearance easier and more efficient. The wise exporter does a thorough job to assure he is in

compliance before exporting anything from the United States. And after he is clear about export laws, he will turn to import laws to assure everything is in place for import compliance should the product he is exporting come back for some unexpected reason. If the export sale fails and the customer returns the merchandise for a credit, you will not want to pay duties on the returned goods simply because you did not plan for a potential return. That sales manager whose new automobile just went up in smoke is not going to be “a happy camper” if the goods are returned and you have to pay duties!

Watch for part 2, in which we will discuss the factors that go into duty payment in more detail.



Tom Stanton is a Certified Customs Specialist and licensed Customs broker with the National Customs Brokers

and Forwarders Association. Tom keeps up-to-date each year with new regulations and compliance requirements, such as 10+2 import requirements, that go into effect January 2010. Tom is also an ex-international traffic manager and an international small package consultant with more than thirty years experience. Tom can be reached by email at tom.stanton@afms.com or by phone at 503-246-3521. In addition, Tom is known as the “Transportation Doctor” and has several videos available on YouTube.



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Following the successful joint launch of the Warranty Benchmark Tracker in March 2009, RLA and MGH Consulting have continued their partnership to develop a three part research paper that assesses the global reverse logistics market for 2009 and beyond. Each paper focuses on warranty spend within the high technology industry across 3 major geographies.



Each market segment is assessed individually, with multiple data sources employed to size both product sales and warranty market values. This quantitative analysis is supported by an overview of service industry practices, identification of the OEM market leaders and predicted future market growth forecasts.

The commentary also compares the mature and developing geographies and explains how lessons learnt

in more developed markets will affect the future trends within the high volume growth zones of the youthful emerging markets.

This analysis aims to enable third party reverse logistics and service suppliers, as well as OEMs and retailers, to identify current and future opportunities within parallel or different product segments and geographies.

The research is available on the RLA website, just go to the publications menu and select "Market sizing research." RLA membership tiers can enjoy discounts on our retail price of \$995 per regional report.

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TECHNICAL TRENDS

L. Bryant Underwood

Change Vectors Software and Currency Part 2

The word of the year is clearly “Change.” In the last issue we reviewed some of the trends occurring in Power and Transportation. This week we will focus on currency and operating systems. Being aware of trends is critical for achievement of success or your very survival in business. My take on these trends is not meant to be definitive. Instead consider this as proffer to stimulate your own development of scenarios for strategic planning.

CURRENCY

It is common to hear any number of talking heads and commentators describe how bad it is for one government to have a trade imbalance or purchase debt from another country. The point that is sometimes forgotten is that any currency can only be spent in its home country. If you have a stack of Japanese Yen you can only spend that currency in Japan. Sure you could exchange it for another currency and then spend it, but you will lose value in the process. The greatest value for your money will always be achieved by spending it on goods with the greatest local content. Many of you will remember that Japan used this very strategy in the 80s when they were buying up US real estate. They realized that by targeting purchases in this way they lost the least value from the transactions. For most companies the main tool for treasury management was arbitrage to determine the best route or parking spot for earnings and to net out the margins between business units in other countries. Years ago, this is about as complex as the business of treasury/currency management used to be.

Today the management of currencies has much changed and is highly complex. We have very exotic and convoluted financial instruments like derivatives that are then packaged to serve as the basis for hedges protecting various market positions. In addition the speed that money moves in society keeps accelerating. This is important because the GDP (gross domestic product) of a country is the outcome of the money in circulation multiplied by the number of times it changes hands. With so much of the movement of currency value completed electronically this speed not only tends to grow GDP but when spending falls will tend to amplify the decline and the change can happen at a blindingly fast rate. How would you like to be a bank manager trying to maintain a safe coverage ratio when funds can move so fast electronically. It is a staggering problem fraught with more risk than most really want to think about.

Then there are government sponsored initiatives like “quantitative easing.” These practices are maddening to the so-called BRIC nations (Brazil, Russia, India & China) because of how much risk that gets folded back into their own currencies. To really grasp how chaotic currency management has become, consider the power of just one of the new tools—derivatives. Recently the worldwide value of derivative contracts denominated in USDs was estimated to exceed 1 Quadrillion dollars. To have a sense of what that means—1 quadrillion miles is equivalent to a little more than 200 light years! Imagine the affect of contracts maturing with this much value could have on the money supply.

In total, these and other practices have made the currencies of today very fragile and tightly interrelated but still burdened with the fact they can only be spent in their home country and most transactions are electronic not paper. To address this IMF (International Monetary Fund), led by a request of the BRIC nations has now begun to schedule the release of SDRs (special drawing rights). This is really a new kind of super currency that some nations are using to reduce risk from high levels of exposure to foreign currencies. So will the SDR be the new replacement for Dollars or Euros? No. It is too complex and cannot respond fast enough to handle the speed of electronic banking. So the long term solution will clearly not be SDRs, but it will be different from the mix of national currencies we have today.

Let me give you two thoughts as to why this will be true:

First consider the impact of Gold. In the last year notice what a player that any type of gold position has been to a successful portfolio of investments. Why is something as antiquated as gold even a point of discussion? I thought we were all “electronic,” the gold standard is just a dinosaur—right? Not really. Gold is filling the need for an alternate to the currency risk and turmoil of today. It is doing this specifically because there are no other good alternatives. Second, although gold has a lot to offer, there is no government that likes gold. Gold takes control away from governments. There is no government that has ever cooperated with a reduction in power or control. That

impetus alone will drive us to all accept new forms of currency that will be much more portable across national boundaries. My opinion is that it will happen sooner not later.

OPERATING SYSTEMS (OS)

Any computer only provides value based on the applications it runs. These applications then parse or present information or perform some type of work. When you think of operating systems most will consider that operating systems are the same as “software.” I disagree. Thinking of an operating system as software is really more of an artifact from recent marketing than a reflection of its real purpose. Operating systems are not software—they are what software runs on. Their real purpose is to provide a layer of abstraction from the nuts-&-bolts of the computers’ operation.

If you want to code a program for a new browser it makes no sense for you to be burdened with writing a new handler to control the harddrive, network card or memory. Nor is it safe to have each application control something like security. Most modern operating systems also provide a structure for common module reuse. For example, you may want to use several word processors. Should each application have its own dictionary? How about decoders that let you see files containing photos or hear music? These are all common ways that operating systems make programming simpler by allowing drivers or modules plug in at the system level. Those resources can then be reused by other software applications. The last major benefit of a well designed operating system is that applications only need to be authored once and should be able to run on any hardware. With all that said, what’s the big deal and why should you care?

Right now the market for operating systems is in crisis. The reason for this crisis is the very wide availability of wired and wireless bandwidth. Back in the old days of CDC Cyber 18s and IBM 360s the presentation of applications was never local. It was always on a very large remote machine. Then processing and memory improved much faster than the capacity and speed


of networking. This forced all computing and applications to become local. As businesses started to deploy LANs applications then migrated to servers. However, again the servers were local.

Now we have today—there is bandwidth EVERYWHERE. To the point that wireless providers are retailing netbook/notebook computers as an adjunct to the real value they provide, the broadband service. If we looked at computing anew, the need for local processing and housing of data is not only not needed anymore—it is not desired. Not only does the data not need to be local—the application has no need to be local.

Consider a common application like banking. When you log on with a PC or mobile phone to perform your banking, there is no element of the application or data that is local. The only exception is really related to the security credentials.

- The core need for a modern operating system includes;
- Common functions and interface regardless of hardware
- A consistent layer to provide security
- Interface with the local hardware

This is a much simpler scope than what is provided by any current commercial operating system today. What has happened over time is the operating systems have become massively bloated. The bloat was created mostly to drive sales and marketing needs to sell new versions. That business model is just not sustainable in the current economic environment. The future of operating systems will be most likely be some form of open-source. Why? Consider Linux. It can run on ANY hardware of ANY size. There are even RTOS (real time operating system) versions that run various systems in cars. The key attractions are much lower costs, improved security. Both of these at-



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tributes occur because of the manner the code is authored. The Open in open-source means that highly skilled programmers worldwide code small snippets of code and then look over each others' shoulder to assure the product is reliable. Any commercial OS is proprietary and essentially secret.

I have a couple of friends at other companies that have told me of their plans to deploy open-source OS and Apps at the desktop. Not only are the licensing costs reduced but the OS/Applications run very well on older hardware. This saves money in deferred hardware upgrade costs and the energy costs are much lower because lower performance hardware still works just fine. This is why you see so many netbooks using Linux and still perform nimbly with slower processors and great battery life. The market today has changed. For the companies that have built layers of products with sales supported by operating system leverage, those times of success from that model are already in the past. There is just too much desire building for greater stability, portability and lower cost.

CLOSING:

A lot to consider. Computing operating system platforms are in upheaval and government management of currency is pressing us to the brink with what current banking tools and management methods can support. Yes there is risk, but these are times that will have much more opportunity than many realize. You have something more to reflect on as you prepare for success. Next issue—we will take a look at robotics. **RLM**



L. Bryant Underwood is Director, Supply Chain for Elbit Systems of America, a leading provider of high performance products and

system solutions focusing on the defense, homeland security, commercial aviation and medical instrumentation markets.

TECHNOLOGY SPOTLIGHT

Green Technologies To Watch

After barely moving for decades, there's been a surge in innovation in energy the past five years, fueled both by society's growing interest in clean energy and by the technology revolutions in other industries, like IT and biotech. That has expanded the definition of clean energy from solar and wind to many other areas.

"We are in a new era of energy innovation," declared Daniel Yergin last week at a forum on clean-energy policy at the Massachusetts Institute of Technology.

Yergin is someone who should know. As the author of "The Prize", a book about the history of the oil industry, and co-founder of Cambridge Energy Research Associates, he advises CEOs of giant oil and gas firms on energy strategy. Like many people in green tech, he's not a typical 1970s-era tree hugger but a hard-boiled business man who sees technology change driven by economic, environmental, and national security reasons.

IBM Supercomputer to Match Critical Thinking Wits With 'Jeopardy' Wonks

IBM has already developed a super-computer capable of beating human chess champions. However, things get much trickier when a game involves answering trivia questions as they're spoken by a human being. The company hopes Watson, a supercomputer it's currently working on, will be ready for the "Jeopardy" challenge sometime next year.

Intel says new PCs will cost you nothing

Intel says that upgrading your company's four-year-old PCs today will pay for itself in 10 to 17 months. But you might say that the world's largest microprocessor manufacturer has a vested interest in such an upgrade.

Those figures come from an Intel-commissioned study conducted by R&D services provider Wipro and revealed today during a press gathering in downtown San Francisco by Robert Croke, Intel VP and general manager of the company's Business Client Group.

The study surveyed CIOs, IT directors, and senior IT managers in 106 enterprise-level North American and European companies. Among its many findings, according to Croke, was that "If you're buying a new set of PCs based on Core 2 Duo technology, you can recoup that investment in 17 months. If you pay a little bit more for your desktop PC with VPro technology ... you can recoup that investment in 10 months because of the increased operational benefit."

Consumer Electronics Groups Join Forces in eCommerce

Major players in Australia's Consumer Electronics sector have joined forces to transform their supply chains through eCommerce.

Putting competition aside, key suppliers and retailers have formed an industry working group, CEWAG (Consumer Electronics Working Action Group).



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Returning Thoughts

Reverse Logistics Wiki, a Growing Wealth of Information

The Reverse Logistics Association Standards Committee has been busy creating a Reverse Logistics Wiki that will be a boost to your Reverse Logistics knowledge resources and help you improve your Reverse Logistics operations.

Reverse Logistics Lexicon

The initial goal of the committee is to create a lexicon resource to gather and help standardize the terminology used in our growing and evolving Reverse Logistics industry. An Internet based wiki is an ideal tool to gather and share this knowledge.

Our Reverse Logistics industry got one of its biggest boosts when we all started sharing. If you recall the early days of the Internet, people quickly learned it was a great tool to share information quickly to a large groups of people. This spawned on-line selling of used goods. Previously there were few channels to effectively display used

items. The creation of eBay, Craig's List and other similar sites enabled sellers of used items to effectively share, inform and communicate with willing buyers looking for bargains. Now companies realized there was huge value available in the returned inventory items collecting dust at the back of their warehouses. Sharing gave our industry a big boost and now the Reverse Logistics industry is looking again to sharing to help your Reverse Logistics operations.

Reverse Logistics Terms, Metrics and Best Practices

The Standards Committee has started the sharing processes with the Reverse Logistics Wiki (at www.ReverseLogisticsWiki.com). Here you will find the beginnings of a Lexicon of terminology with the addition of Metrics and Best Practices. The framework to continually add information has been defined. Many people have generously offered their time and knowledge.



Dr. Dale S. Rogers and Dr. Ronald S. Tibben-Lembke (who is also Chairman of the Standards Committee) from the University of Nevada, Reno, Center for Logistics Management have kindly shared the terminology list from their book "Going Backwards: Reverse Logistics Trends and Practices." However, we also need help from Reverse Logistics people like you to build the knowledge base.

Share One Small Piece of Your Reverse Logistics Knowledge Today

As you may know, the popular Wikipedia.org website has assembled over 9 million articles from users sharing their knowledge. The Standards Committee and our Reverse Logistics industry need your help in a similar way by sharing your Reverse Logistics knowledge. Please send us one small piece of your knowledge. A few sentences, a best practice or a metric you use daily. Soon we will have a wealth of knowledge to help you quickly and efficiently improve your operations.

Send us your knowledge today. No login required, just a quick email. We will get it entered to the wiki and soon we will all have a source of shared knowledge.

Good Luck (and thanks in advance for the help!)



Paul Rupnow

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“MOST DYNAMIC ECONOMY”

– *Kauffman 2008 State New Economy Index*

- #1 “Inventor Patents”
- #2 “Online Population”
- #3 “Fastest Growing Firms”
- #6 “Venture Capital”

Utah #1

ECONOMIC OUTLOOK

– *Rich States Poor States*

ALEC – Laffer State Economic Competitiveness Index

Based on 16 important state policy variables, Utah ranked number one in the nation for overall future economic outlook.

Utah #1

“THE BEST MANAGED STATE IN THE NATION”

– *The Pew Center on the States*

The Center ranked the states based on how well they manage their budgets, staffs, infrastructure and information. States were graded on their recruitment and retention of qualified employees, their use of information and technology, management of budgets and purchasing systems, and planning for improvements to roads, bridges and other core infrastructure.

BEST-PERFORMING CITIES 2008

Where America's Jobs Are Created and Sustained

– *Milken Institute*

Top 25 Large Metros

- #1 – Provo-Orem, Utah
- #3 – Salt Lake City, Utah
- #18 – Ogden-Clearfield, Utah

Utah #1

TECHNOLOGY CONCENTRATION AND DYNAMISM

– *Milken Institute*

The Milken Institute, an economic think tank, measured the stock of capable entrepreneurs and risk capital available to support the conversion of research into commercially viable technology products and services.

UTAH TOP 10 STATES WITH STABLE REVENUES FOR 2009

– *National Conference of State Legislatures*

Utah's situation, thanks to conservative budgetary forecasts and not spending one-time money on ongoing needs, is much sunnier by comparison to other states. “Utah is in a relatively healthier fiscal situation than most states, and in fact, one of only 10 states to project a stable outlook for revenues” for the 2009 fiscal year.

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