# Tools to manage reverse logistics

## Research executive summaries series
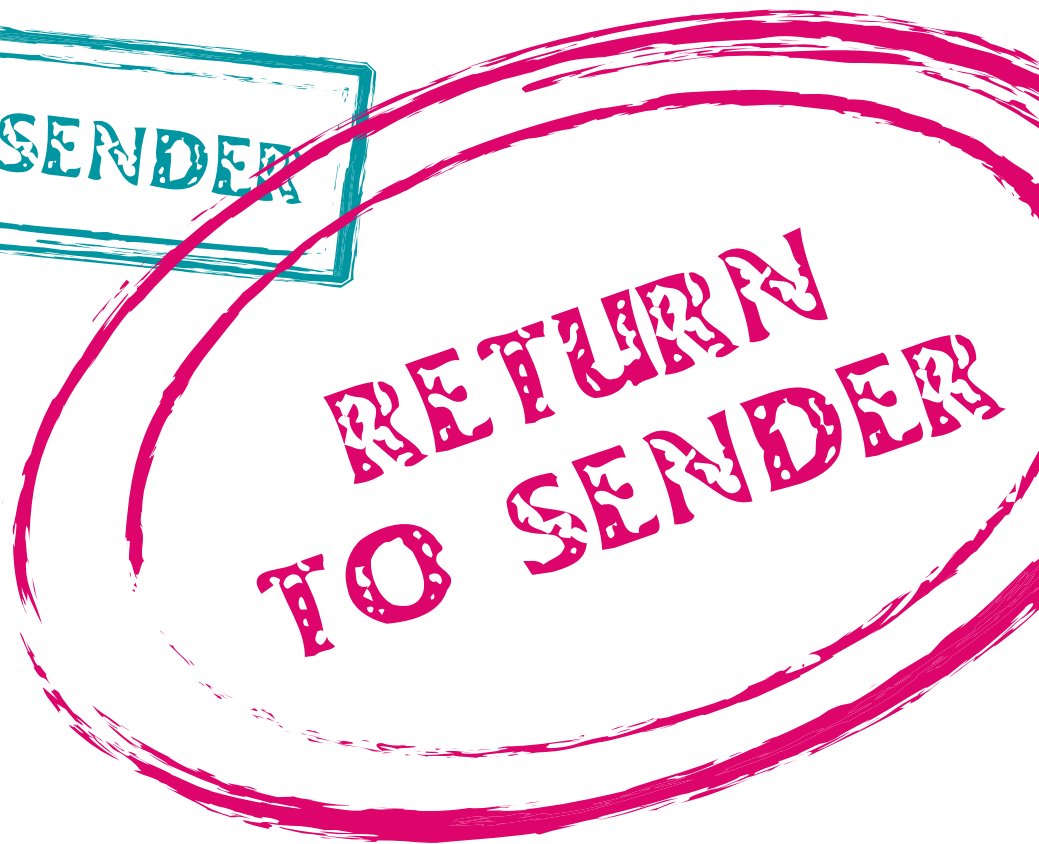
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## Overview of project

Reverse logistics has become an area that retailers and manufacturers cannot ignore. Companies can see between 4% – 30% of their products returned by customers and total UK retail returns have been valued at around £6 billion per annum (Bernon and Cullen, 2007). Despite the fact that managing these returns incurs substantial costs through logistics, inventory and disposal, many companies appear to employ inadequate processes for dealing with these returns. Given the tightness of margins in many organisations, it is worth emphasising that the improved management of these returns can have a significant impact on bottom line performance. There can also be a significant impact on environmental concerns as well, since reverse logistics operations can involve a large amount of lorry movements and consequential $CO_2$ emissions. Given this opportunity to both improve bottom line performance and have a positive impact on environmental performance, we undertook research work for both the Department for Transport and CIMA on the development of a Reverse Logistics Diagnostic and Performance Improvement toolkit. The toolkit enables companies to audit their returns management activities and identify where opportunities exist to reduce costs and waste and improve customer service. The toolkit was published in late 2008 in both electronic and hard copy format.

What was particularly interesting in this research was the recognition that management accounting and management accountants can play an important role in this area. Management accountants can use their analytical skills to highlight the financial benefits to be gained from making improvements to reverse logistics processes. Interestingly, techniques such as quality costing and transparent performance measurement systems have a significant role to play.

## Objectives

1. Develop a Reverse Logistics Diagnostic and Performance Improvement toolkit.
2. Engage management accountants, and embed management accounting, in the development of this toolkit.

The importance of the contribution of management accountants in this area became particularly evident in the early workshops that we held with supply chain managers and logistics managers as part of the Department for Transport project. None of the earlier workshop members were from the accounting and finance area, but a key theme arising out of the workshops is the positive role that management accountants can play in the supply chain and logistics area. Delegates from the workshops were looking for support from management accountants in terms of key performance indicators, costing information that recognised inter-organisational relationships and helped them to both reduce costs and enhance value for their organisations.

## What is reverse logistics?

The scope of reverse logistics throughout the 1980s was limited to the movement of material against the primary flow. Through time, more sophisticated definitions began to emerge and Rogers and Tibben-Lembke (1998) defined reverse logistics as *'the process of planning, implementing and controlling the efficient, cost effective flow of raw materials, in-process inventory, finished goods and related information from the point of consumption to the point of origin for the purpose of recapturing value, or proper disposal'*. However, this definition is still somewhat limited since many products are returned to a point of recovery and not their origin (De Brito and Dekker 2002). In recent years, a number of definitions have emerged. The Reverse Logistics Association refer to the term reverse logistics *'as all activity associated with a product/ service after the point of sale, the ultimate goal to optimize or make more efficient aftermarket activity, thus saving money and environmental resources'* (Reverse Logistics Association, 2009).

Reverse logistics is a broad area and, in this particular study, we focused on the management of retail returns. Our particular objective was to view the management of the reverse logistics process from a holistic supply chain approach rather than just something which started after the point of sale (see Figure 1).

**Figure 1:** Product life cycle view
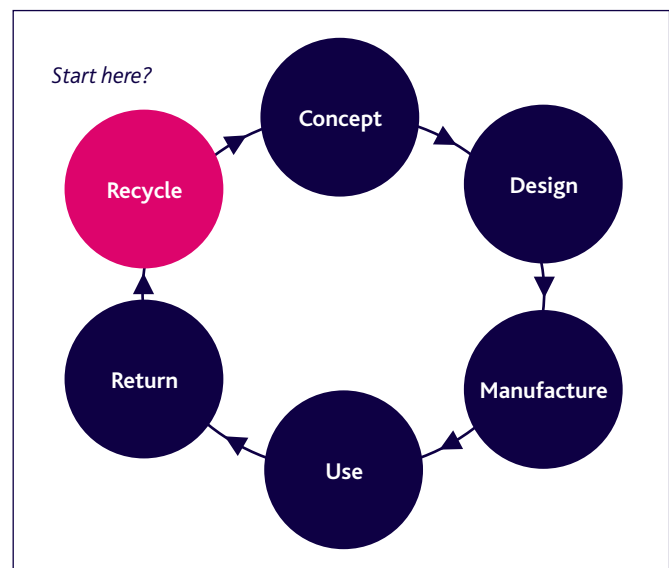


The problem identified in Figure 1 is that organisations may start to think about the reverse logistics process at the recycling point whereas, to ensure efficient and effective reverse logistics processes, managers need to think about returns at the design stage of the product or process. This is important because many of the drivers of reverse logistics (Figure 2) actually occur as a result of product and service decisions taken at the design and planning stage of product and service provision (Bernon and Cullen, 2007).

**Figure 2:** Drivers of product returns (Bernon and Cullen, 2007)

- **Forecast accuracy and demand variability.**
- **Promotional activity.**
- **New product introduction.**
- **Product range and safety stock policy.**
- **Product lifecycles.**
- **Logistics trade-offs.**
- **Purchasing policies.**
- **High on-shelf availability.**
- **Legislative factors.**
- **Cash Flow Management.**
- **Liberal returns policies and customer returns.**
- **Customer 'no fault found'.**

## A framework for managing reverse logistics

Arising out of an earlier Department for Transport study, Bernon and Cullen (2007) developed a framework for managing reverse logistics which provided the initial impetus to undertake this particular study and engage management accounting and management accountants in the management of product returns (see Figure 3).

**Figure 3:** ICE model for managing product returns (Bernon and Cullen, 2007)



The ICE model provides a way forward for managing product returns. At the centre of the approach is a hierarchy of product disposition (Carter and Ellram (1998):
- reduce
- re-use
- recycle.

**Reduce** will lead companies to examine how they can reduce returns arising in the first place through the better management of the supply chain.

**Re-use** will lead to organisations maximising the asset value of returns through effective refurbishment programmes and disposition through traditional and emerging novel secondary routes to market.

**Recycle** is the lowest disposition route and refers to the environmentally best route for recovery of material from products that cannot be resold.

To be effective in utilising this disposition hierarchy, Bernon and Cullen (2007) suggested that companies need to incorporate three management approaches, namely:
- integration
- collaboration
- evaluation.

**Integration** considers the four themes of strategy, network infrastructure, outbound and returns management and process management.

**Collaboration** emphasises the need to develop a number of collaborative arrangements to manage final product dispositioning effectively. Collaboration may be with third party logistics operators, through shared services and with competitors.
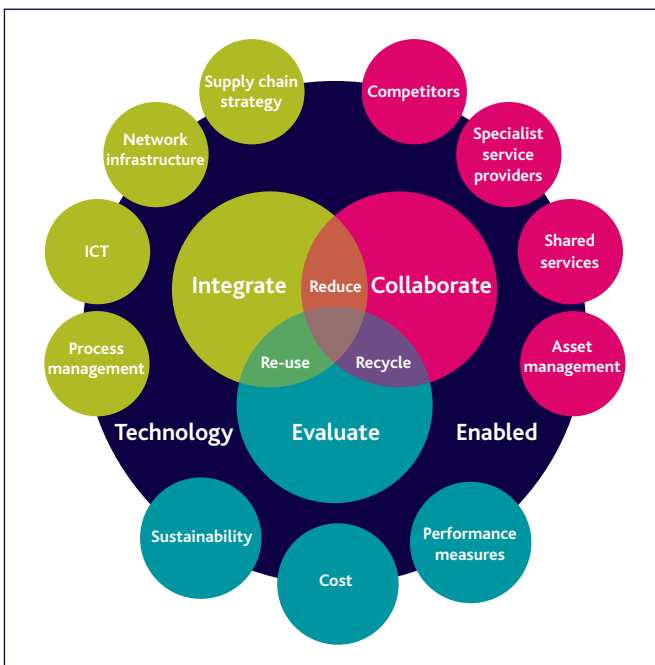
**Evaluation** recognises that in order to support product return programmes, companies need to evaluate their performance. In our previous research on this area, few companies measured the true costs of returns since they did not consider opportunity costs (e.g. working capital tied up in returns). We suggested that a total cost approach should be adopted by organisations to determine the true cost of returns in order to improve decision making.

After developing the ICE model from our previous research, this current project funded by both the Department of Transport and CIMA had the objective of utilising the ideas from the ICE model and developing the reverse logistics toolkit.

## Method

The toolkit was developed through intensive interaction, 13 workshops/industrial forums (each workshop/industrial forum was attended by on average 20 managers), with managers from around 40 companies connected to the UK retail sector. The participants represented a range of retail sectors including grocery and supermarkets, general merchandisers, home and personal care, home furnishing, catalogue retailing, car entertainment and accessories, electronics, toys, mobile phones and cosmetics. In addition to retailers, specialist third party logistics providers and manufacturers in the retail supply chain were present at the workshops and industrial forums. CIMA members were involved in three of the workshops/forums. We also undertook more detailed case study investigations as part of the wider Department for Transport project and management accountants were involved in interviews and action research activities at these companies (e.g. Halfords).

## Findings and implications

The Reverse Logistics Diagnostic and Performance Improvement toolkit is arranged around the following nine key themes that make up the management aspects of reverse logistics:
- cost and performance measurement
- avoidance of product returns
- process management
- physical network
- inventory management
- information and communication technology
- material handling containers/totes
- sustainable distribution
- compliance with legislation.

## An overview of the toolkit

Figure 4 on page 5 provides an overview of the toolkit.

**1. Main headings.** The toolkit is divided into two main sections. The left hand side contains the self assessment element which companies will undertake to evaluate current performance. The right hand side contains the performance improvement element which supports companies moving to the desired performance.

**2 and 3. Assessment themes and assessment questions.** There are nine assessment themes within the toolkit. Each of these themes has a range of self assessment questions attached to them.

**4. Impact on sustainable distribution.** Each question has been ranked according to the level of impact on sustainable distribution with regard to benefits to the environment and society. The ranking protocol used is Low (L) and High (H).

**5. Assessment level.** There are two levels of assessment contained within the diagnostic toolkit, namely minimum standard and advanced standard. Companies will select one of these levels depending upon their perceived need. The different assessment levels have a different number of self assessment questions linked to them.

**6. Traffic light performance measure.** The self assessment audit is performed by the user addressing each question using a simple traffic light system. Each question has a drop down menu to make the process quick and easy to perform.

**7. Drop down 'Help' box.** To provide additional supporting information, a drop down help box is provided for a number of the questions.

**8. Identification of action required.** The action required box supports the improvement process through the generation and recording of remedial actions for those questions that are indicated as 'red' (and 'amber' where appropriate) during the assessment.

**9. Project management.** The management of the improvement process can be tracked by using the three far right columns. This allows remedial actions to be identified, assignment of responsibilities, completion dates and final sign-off.

**10. Hyper link.** Where a question referred to a concept or technique a hyperlink was provided which presented the reader with basic information about the concept in question.

As already mentioned, this is in electronic form and managers will undertake a self-diagnosis of their processes. A traffic light system is used to illustrate whether the organisation is good or bad in relation to each question. To determine which questions you need to answer, we have identified minimum standard (a company where product returns are always likely to represent an insignificant part of your company's supply chain activity and account for a minimal amount of supply chain cost) and advanced standard (a company where product returns represent a strategic element of your company's supply chain activity and account for a significant level of supply chain cost). The diagnostic toolkit also has a performance improvement element against each question with suggested techniques for change. So for example, where red is indicated against a specific question, you can identify performance improvement actions that need to be taken and identify the person responsible.

## Figure 4: Overview of the toolkit



## Carrying out the diagnostic

Figure 5 illustrates a part of the diagnostic toolkit covering performance measurement.

## Figure 5: Part of the diagnostic toolkit[1]

| No | SI | SELF ASSESSMENT QUESTIONS | Assessment level | | Traffic light ranking |
|---|---|---|---|---|---|
| | | | Minimum standard | Advanced standard | |
| | L | **Performance measurement** | | | |
| 17 | L | A balanced scorecard approach is used to measure performance. For further information 'click here' | | ✓ | Red |
| 18 | L | There is a target for desired asset recovery values for all returned products | | ✓ | Green |
| 19 | L | The monetary value recovered from product returns operations is measured over time | | ✓ | Red |
| 20 | L | Targets are set for each of the measures identified | | ✓ | Green |
| 21 | L | The targets that are set are based on performance by best in class | | ✓ | Green |
| 22 | L | The performance of different retail stores is measured in terms of returns | ✓ | ✓ | Red |
| 23 | L | League tables are produced to identify variation in the number of returns by each retail store | ✓ | ✓ | Amber |
| 24 | L | Retail stores are recharged with the cost of 'no-fault found' products | | ✓ | Green |
| 25 | L | The full costs of returns are charged back to the buying department | | ✓ | Red |
| 26 | L | The time between return of the product and credit by the supplier is measured | | ✓ | Green |
| 27 | L | The volume of fully laden backhauled vehicles is measured | | ✓ | Red |
| 28 | L | The yield from refurbished products is measured | | ✓ | Green |
| 29 | L | The cost of refurbishing products is measured | | ✓ | Amber |
| 30 | L | Performance measurement systems are monitored to ensure that they do not encourage dysfunctional behaviour | | ✓ | Amber |
| 31 | L | Performance measures are in line with the company strategy | ✓ | ✓ | Green |

[1] The links to the full toolkit can be located under useful links on page 7.

The toolkit also provides the user with some examples of the ways in which different techniques can be used. The example below is an extract from the toolkit covering an example around quality costing:

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### Quality costing example

**A simple example of the use of quality costing in the reverse logistics area.**

- Cost of prevention – training employees in stores in order to reduce customer returns.
- Cost of appraisal – following checklist of processes to ensure that returns are minimised.
- Cost of internal failure – costs of warehouse space allocated to returns from stores that never reached the customer.
- Cost of external failure – costs of warehouse space allocated to returns from customers.
- The failure costs identified above are particularly important because of the 'opportunity cost' of space being unavailable for good stock.

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As part of the development of the toolkit, we engaged with a number of companies in significant detail and Halfords, one of the companies involved in the project, has made significant improvements to their reverse logistics processes. Halfords' business is made up of three key product categories: car maintenance, car enhancement and leisure. Returns were previously shipped back to distribution centres and then were 'jobbed off' at a cost to the company. Halfords now sell some of the safely saleable goods below a certain value as 'manager's specials' in store, leading to a 40% reduction in the number of items flowing back through the supply chain. The provision of a technical helpline service has significantly reduced the returns by customers of some electronic goods and more complex products. This has improved customer service whilst at the same time reducing return costs. The success of Halfords WeFit service for customers, including set-up and demo for satellite navigation products, has also had a positive effect in reducing returns of many products.

A particularly good example of the use of quality costs centres around this treatment of satellite navigation systems. When they started to sell these products, the company found significant no-fault found returns (leading to an unacceptable level of failure costs) because the customers did not fully understand the product. As part of the changes introduced, Halfords incurred additional prevention costs in the forms of detailed instructions to staff (manuals) and increased expenditure in terms of time involved in taking customers through the installation process. Not only has this decreased the number of returns, but it has also become an attribute to the company in terms of customer service (WeFit). Returns avoidance is seen as an important key to reducing reverse logistics costs, increasing customer satisfaction and reducing the environmental impact of returns.

Chris Hall, Head of Quality and Cost Reduction commented that '*the identification of new tools and the support provided by discussions at the workshops played a vital part in the implementation of change at Halfords*'. Central to these changes was the role of the management accountants. They produced transparent information (focused performance measurement reports) about the costs and opportunities associated with changes in reverse logistics processes. This created new lines of investigation with suppliers and initiation of root cause analysis. Their adoption of quality costing thinking led to a reduction in overall costs and an improvement in value for the customer.

### Performance improvement

In terms of performance improvement, after the self assessment has taken place, the toolkit provides space and suggestions for action (see Figure 4). For example, where the self-assessment identifies red or amber areas, what actions can be taken to improve performance in that area. A range of improvement tools are suggested for practitioners to use (e.g. six sigma, mapping, quality costing, activity based costing) that can support process improvement in each of the highlighted activities.

### Skill set required

A management accountant engaging in a project of this nature would be required to use their analytical skills and team working skills in order to be successful. Being part of a team working with colleagues from other managerial disciplines would seem to be a key driver to successful implementation of the Reverse Logistics Diagnostic and Performance Improvement toolkit. The skill set needs to incorporate non traditional accounting methods that are used beyond an organisations own organisational boundaries. The ability to 'think outside of the box' is particularly relevant here.

### What is the timescale required to implement the use of the toolkit

In terms of the diagnostic part of the toolkit, the time required to undertake the diagnostic depends on the assessment level being undertaken. If the assessment is being undertaken at the minimum standard level, then the task could be completed within a few hours. However, if the assessment is being undertaken at the advanced standard, then the task would take around three days.

In terms of the performance improvement part of the toolkit, initiating and completing improvements would vary in length. Some actions could be implemented relatively quickly whilst others would take much longer. This is similar to any change process that requires constant focus on continuous improvement.

## Conclusions

Our research study found that management accountants and management accounting clearly have a role to play in the management of improved reverse logistics processes. Managers from other disciplines engaged in these processes were strongly in favour of management accountants being involved. There was strong support for the idea that management accounting information could be used as a driver of change within organisations. Increased transparency and awareness of the real costs of reverse logistics were an essential first step in trying to improve processes and improve both bottom line performance and customer service. Recognition that improved reverse logistics processes would also reduce transport movements was evident, although the companies concerned did not particularly include sustainability measures as part of their transparent performance information.

Using ideas such as quality costing and the concept of opportunity costing emphasised the importance of returns avoidance rather than dealing with the impact of returns later. It is important for accountants to use non traditional forms of accounting in order to engage with their colleagues, both inside and across organisational boundaries, in order to improve profitability and customer service. Management accountants must engage with their colleagues from other disciplines in looking for innovative ways to use accounting information in order to take organisations forward. They must also recognise the importance of supply chain accounting and inter-organisational accounting rather than just think inside their traditional organisational boundaries. Much of the diagnostic and performance aspects of our toolkit are based on activities taking place across organisational boundaries with particular emphasis on relationships with suppliers and customers.

## Useful links

Landing page:
**www.shef.ac.uk/lscm/reverse_logistics.html**

Reverse logistics toolkit:
**tinyurl.com/reverselogisticstoolkit**

The LSCM homepage:
**www.shef.ac.uk/lscm**

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## Further reading

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