

Reverse Logistics: A Review of Case Studies

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Abstract. Reverse logistics deals with the processes associated with the flows of products, components and materials from users/owners to re-users. This paper provides a review and content analysis of more than sixty case studies on reverse logistics. The case studies deal with issues such as the structure of the networks, the relationships between the different parties involved on the networks, inventory management, planning and control, and information technology. The analysis concerns the following questions: what is returned, why do these return flows exist, i.e. what are the drivers/reasons for these flows, how are these return flows being recovered, and finally, who is involved? We end with a summary and suggestions for further research.

Key words: Reverse logistics; Case studies; Content analysis.

1 Introduction

Reverse logistics, dealing with the physical flows of products, components and materials flowing from users/owners to re-users, is a growing field both in practice and in the academic world. In order to get insight in how reverse logistics are dealt with in practice, field studies and surveys are useful. Examples of the latter are presented in (Rogers and Tibben-Lembke, 1999; Guide, 2000).

This paper gives some idea about the diversity of logistics practices via a content analysis for more than 60 case studies. This analysis is useful for both practitioners and academics, by giving insight in how companies are dealing with reverse logistics, which are the trade-offs that play a role during decision making, how these decisions are supported and so on. Quite some case studies on reverse logistics have been described in the literature, dealing with different industries, recovery options and drivers, see e.g. (Kopicki et al., 1993; Kostecki, 1998; Lund, 2001; Flapper et al., 2004). However, there are many more case studies available in literature that are scattered over journals for very different research communities. Besides, in a number of countries in the forefront of reverse logistics, a substantial number of case studies has been published in languages other than the lingua franca and is therefore not accessible for the majority of the research community. The main purpose of this paper is to give an overview of the above case studies.

The remainder of the paper is organized as follows. In Section 2 we firstly define what we mean by case study and describe the methodology used for finding and classifying the case studies presented in this paper. Next, in Section 3, we

provide overall statistics for the set of cases discussed. After that, in Sections 4 to 8, we discuss the case studies that we found in detail, and present observations, propositions and research opportunities. Finally, in Section 9, we end with a summary of our main findings and our main conclusions.

2 Methodology

By case study we mean an in-depth analysis of a practice, leading to an understanding of a situation within its context (Stake, 1995). This definition rules out mere examples short on details, as well as the sole description of business practice often found in professional journals. The latter does not mean that we think that professional journals are not useful for learning about reverse logistics. However, publications in these journals are more likely to be biased than publications in scientific literature, for instance because often they are also used as a marketing tool. We used the following on-line sources: Science Citation Index Expanded (<http://www.sciencedirect.com/>) of the Institute of Scientific Information, and ABI/INFORM Global (<http://www.proquest.umi.com>) of the Bell & Howell Information and Learning Company, using the key words listed in Table 1 and (a combination of) the words: logistics, planning, control, transport, inventory, capacity, production, information.

Table 1. Key-words used for the literature search

Asset recovery	Post-consumer	Repair
By-products	Producer	Repairable
byproducts	responsibility	Resale / re-sale
Containers	Product ownership	Resell / re-sell
Co-products	Product recovery	Return (includes
coproducts	Product stewardship	commercial returns)
Core	Reassembly	Reuse/ re-use
Defects	Rebuild	Reutilisation
Defective	Recalls	Reusable
Disassembly	Reclaim	Reverse logistics
Dismantling	Reclamation	Rework
Disposal	Reconditioning	Salvage
Downgrading	Re-consumption	Secondary (market,
Energy recovery	Recovery	materials)
Environment	(product, resource,	Separation
Garbage	asset)	Source reduction
Gate keeping	Recycling	Take back
Green logistics	Refill	Upgrading
Material recovery	Refillable	Value recovery
Obsolete (stock)	Refurbishing	Warranty
Outlet	Remanufacturing	Waste
Overstock	Repack	

Moreover, we went through some other sources dedicated to reverse logistics: the (Dutch) Handbook of reverse logistics, and the proceedings related to the