THE CONCEPT OF REVERSE LOGISTICS. A REVIEW OF LITERATURE

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ABSTRACT

This paper aims at providing a review of Reverse Logistics concept from a broad set of articles, published mainly in the last decade. From their reading, the author has detected the lack of a desirable largely accepted consensus on what constitutes Reverse Logistics, either on what the range of activities should be included within its scope or how to denominate each of its options in a not fuzzy way.

The clarification of the concept matters for several reasons. On the one hand, most of the so called, environmental regulations -which have been passed in a growing manner, in recent years and in many parts of the world- usually mention some objectives to be reached in certain periods of time, in relation to some of the Reverse Logistics activities (being perhaps the most common one, recycling targets). Given that not only consumers, but also both companies and municipalities are committed with these goals, it would be handy and desirable to have a clear idea of what is meant by each denomination and the implications that each one may have.

On the other hand, having a definite guideline of this conceptual framework would allow for some comparative studies about the different levels of implementation within the members of the chain or between different channels, being more accurate and reliable.

On the previous literature review basis, the paper concludes by providing a reasoned characterization of this new part of the Logistics.

Key words: Reverse Logistics, Review of literature, Concept proposal

1. INTRODUCTION.

Reverse Logistics is an issue that has received growing attention, above all, in the last decade, given the confluence of several situations. On the one hand, there is a verifiable concern about environmental matters and sustainable development. In this sense, several are the legal regulations that have been passed in a number of countries, being perhaps the pioneers, Germany (with its taking-back packaging and electronic devices regulations) and Netherlands (with its stringent automobile laws). However, the effect has quickly spread out along Europe, USA and Japan, among others.

On the other hand, economical reasons have also had their contribution in this increasing importance of Reverse Logistics issues. By means of the returned products, companies stand the possibility of recovering either constituent material, that not

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longer need to be purchased in the same quantities, or added-value. Whether the savings come only from materials purchasing costs or from materials, labor and overhead costs respectively, firms may are increasingly interested in being efficiently involved as market competition shrink more and more the margins.

Perhaps due to its rapidly growing in importance role, the concept of Reverse Logistics has not been kept sharply defined. In fact, as several authors contend (Fleischman, 2000; Mason, 2002; Soto and Ramalhinho, 2002; Kivinen, 2002; Tan et al., 2002) and from the review of literature, there is not yet a largely accepted consensus about defining Reverse Logistics in practice, given among others the broad topics susceptible of being covered by it, activities, products, points in the supply chain, etc.

Reverse Logistics is not a blur in all its facets. As we will see, definitions sometimes overlap in some of them. However, some other aspects may be judged as giving only a partial vision, whereas in other cases, they may become controversial. For instance, if a vendor is not able to sell a certain product to the initially appointed market and then he decides to send it to his own Distribution Center from where the unsold product may be resold to another vendor or broker who will try to sell it in secondary markets, should the whole operation be considered as “Reverse Logistics flow”?

The paper is built as follows. In the next section the above idea is reinforced by definitions extracted from the review of recent literature. The sample of definitions chosen to be included in the paper did not aim at being exhaustive (more articles than the ones put forward where reviewed, although only the ones considered as most representative for the objective of the analysis were included). By comparing the different meanings provided by the different authors, the lack of an overall agreement results diaphanous. Section third is then concentrated on the terms, which have been detected to be the main source for the different interpretations. In fourth section some beliefs are disclosed. All these considerations are taken into account in the fifth section to round off with delineating a concept proposal. Conclusions are drawn in the final section.

2. REVIEW OF LITERATURE

Beckley and Logan (1948), Terry (1869) or Giulitinian and Nwokoye (1975) had already pay attention to returns but without referring to them as Reverse Logistics flows. Murphy and Poist (1989) are some of the first authors in using Reverse Logistics as such. They used Reverse Distribution as an equivalent term (after them, the double terminology has also be kept in some cases [Barry et al., (1993); Carter and Ellram, (1998); Jayaraman et al., (2003)]. Murphy and Poist define Reverse Logistics (p.12) as “the movement of goods from a consumer towards a producer in a channel of distribution”. Therefore, these authors do already touch upon the direction to adopt by the flows considered as Reverse Logistics flows. Any good that may satisfy this condition is considered then as taking part in the Reverse Logistics flows. Producer is not necessarily appointed as the original manufacturer. As far as the distribution channel is concerned, nothing is specified in the definition. Doubts may arise between the two main possibilities to be distinguished: the referred distribution channel being the previously utilized in the forward channel or any other.
In 1992, Pohlen and Farris II draw the attention about the fact that the recyclable material does not necessarily flow backwards through the same channel. The question that is raised now is what they meant at “recyclable”. Only recyclable material may use different channels to go backwards? Or, are they using recyclable in a very broad sense of the term?

For Giuntini and Andel (1995, p. 73) Reverse Logistics is defined as “an organization’s management of material resources obtained from customers”; with this definition the authors skip the problem of saying exactly the direction taken for the material resources. Even more, they seem to stress just one aspect for a material resource to be entitled to be considered as a Reverse Logistics flow; this unique feature is its origin. As long as the item come from the consumer, the activities operated on it will be considered Reverse Logistics activities.

In the same year 1995, Thierry et al. coin the term “Product Recovery Management” (PRM) to describe “all those activities that encompass the management of all used and discarded products, components, and materials that fall under the responsibility of a manufacturing company. The objective of product recovery management is to recover as much of the economic (and ecological) value as reasonably possible, thereby reducing the ultimate quantities of waste” (Thierry et al., 1995, p. 114).

According to them, products and materials can be sent back either to the original manufacturer (therefore, in the same business chain), or to other companies involved in other business chains, provided the activity of these companies consist of manufacturing.

They distinguish three categories of activities: direct reuse, product recovery, and waste management activities. Returned products and components can be resold...
directly, recovered, or disposed (incinerated or landfilled). Focusing only on recovery options, five different alternatives can be found: repair, refurbishing, remanufacturing, cannibalization, and recycling, listed in order of the required degree of disassembly.

Although it has to be noted that these authors did not use the term Reverse Logistics, a parallelism can be easily drawn from the mention of the activities included within the scope of PRM and the direction followed by the recovered items in the figure. Another conclusion to highlight from their work is that what they define as Direct reuse/resale or Incineration or Landfilling is kept out from the PRM coverage even if some backwards trip is also implied by them.

"Reverse Logistics refers to the logistics management skills and activities involved in reducing, managing and disposing of hazardous or non-hazardous waste from packaging and products" (Kroon and Vrijens, 1995, p.56). If this definition was also listed in this work to make evident the extent to which, so far, confronted concepts can be found in the literature. If Thierry et al. have discarded waste management from the PRM definition, these authors seem to focus on it. Their article is concerned with the flows generated by the returnable containers, which are a type of secondary packaging⁴ in the sense that they are susceptible of being used more than once in the same form.

According to Stock (1998, p. 20), the term Reverse Logistics is used to refer to “the role of logistics in product returns, source reduction, recycling, material substitution, reuse of materials, waste disposal, and refurbishing, repair and remanufacturing”. Although the majority of possible focuses, mentioned in the definition, have their correspondent translation in Thierry’s terms, Stock (like Kroon and Vrijens and unlike Thierry et al.) also stresses on waste disposal. Source reduction will be commented a bit later in this paper.

"Reverse Logistics is a process whereby companies can become more environmentally efficient through recycling, reusing and reducing the amount of materials used. Viewed narrowly, it can be thought of as the reverse distribution of materials among channel members. A more holistic view of Reverse Logistics includes the reduction of materials in the forward system in such a way that fewer materials flow back, reuse of materials is possible and recycling is facilitated”. (Carter and Ellram, 1998, p. 85). The fact of reducing materials used in the processes is according to some authors (Rogers and Tibben-Lembke, 1998) considered as Green Logistics and not Reverse Logistics, although the same authors agree in that the bound line between both concepts is not always clear. On the other hand, Carter and Ellram seem to keep tight to the same channel in which the forward flow was generated, against the more broad view in which other companies outside the business chain could be favoured from the returns flows.

Krikke et al. (1999) mention the need for the European Original Equipment Manufacturers to set up a reverse logistic system for their discarded products, which, according to them, involves determining an optimal degree of disassembly and assigning optimal recovery and disposal options.

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⁴ Secondary packaging is packaging material used for packaging products during transport from a sender to a recipient (pallets, slipsheets, etc), either in retail or in industry.
“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 or creating value or for proper disposal” is the definition given by Rogers and Tibben-Lembke (1999, p. 2; 2001).

This definition is notably more ambitious, naming different types of items (no matter their condition of new or used) along with an idea of direction followed by the materials flows. However, solely the initial point of origin in traditional chain is accepted as destination of these reverse flows. When arguing the reason why, in their view, source reduction belong more naturally to Green Logistics than to Reverse Logistics, they add the following (Rogers and Tibben-Lembke, 1999, p. 3): “if no goods are being sent “backwards”, the activity probably is not a Reverse Logistics activity.

In spite of it, other possibilities are still admitted within their particular Reverse Logistics scope, such as, secondary markets, outlets [“(in the clothing industry) retailer’s only sales alternative channel” (Rogers and Tibben-Lembke 1999, p. 82)], etc. even if these destinations are not the initial “point of origin”.

The later remark also applies to the definition given by Dowlatshahi (2000, p. 143) when he contends that Reverse Logistics is “a process in which a manufacturer systematically accepts previously chipped products or parts from the point for consumption for possible recycling, remanufacturing or disposal.”. This author coincides then with some previously mentioned starting and final points of the reverse flows, being respectively the point of consumption and the original manufacturers. He differs from others in discarding returns from other different partners in the chain than consumers. Disposal is deemed within the scope of Reverse Logistics although secondary markets are not conceived within it.

Ritchie et al. (2000) underlines that logistics does not stop with the delivery of goods to customers, but also offers the opportunity for stocks to be returned to suppliers via a feedback loop. He points out, for instance, the increasingly frequent occurrence that product recalls appear to have in the last years in private sector (as his article examine the Reverse Logistics process within the Manchester Royal Infirmary Pharmacy; in this pharmaceutical arena, the efficacy in withdrawing expeditiously the drugs from market, in case of need, result critical). His perspective drives the attention again on the suppliers as final destination of returned products and thus, endorsing the backwards direction of goods flows.

Fleischmann (2000), one of the authors aware of the confusion surrounding the concept, and after considering four definitions from the literature, concludes in the following characterization (p. 6): “the process of planning, implementing and controlling the efficient, effective inbound flow and storage of secondary goods and related information opposite to the traditional supply chain direction for the purpose of recovering value or proper disposal”. As he recognizes, municipal waste collection is not accepted within the definition’s scope, as it does not concern flows opposite to the traditional supply chain direction. On the other hand, “upstream flow” substitutes the producer destination of returned goods stated but some other perspectives.
“The logistics of return flows, called Reverse Logistics, aims at executing product recovery efficiently” (Hillegersberg et al., 2001, p.74). When the authors stress the meaning of return flows they only admit end of life (EOL) products either for customer use, or for obsolescence in the forward supply chain. Apart from the activities included by Thierry et al. within the PRM, Hillegersberg et al., unlike them, admits also energy recovered by incineration. The list of products susceptible of returning is in this case more restricted.

A research report of Kivinen (2002) brings another perspective. He writes that different service providers have different types of Reverse Logistics concept. For instance, some companies may speak only about the recycling of goods, which may actually include sophisticated features of Reverse Logistics. His piece of advice is therefore, between the parties involved, to define clearly what Reverse Logistics will be understood in their relationships, as different persons will most probably have different views about Reverse Logistics.

To conclude the review, we provide three recent formal definitions:

The European Working Group on Reverse Logistics (see De Brito and Dekker, 2004) puts forward the following definition: “The process of planning, implementing and controlling backward flows of raw materials, in-process inventory, packaging and finished goods, from a manufacturing, distribution or use point, to a point of recovery or point of proper disposal”

The RL Executive Council⁴: “RL is the process of moving goods from their typical final destination to another point, for the purpose of capturing value otherwise unavailable, or for the proper disposal of the products”.

Next section summarizes the main confusing terms detected from the review of literature.

2. SOME CONFUSING TERMS

The confusion detected regarding the following terms was mainly due to a pair of words, which may have a close meaning in certain contexts or double meanings of the words. 7 terms are analysed in the following: what is implied by “backwards” direction, are reverse flows equivalent to flows of returns, are recovery and reverse synonyms, what is the difference between Green and Reverse Logistics, what is disposition, or recall or recycling?

2.1. Backwards direction

In accordance to the previous section, it follows that no unanimity exist regarding the direction products must take, once they abandon the forward supply chain, fact that

⁴ http://www.unr.edu/coba/logis/page6.html
may happen at any point/time within it. Some authors (Carter and Ellram, 1998; Dowlatshahi, 2000; Ritchie, 2000; Guide et al., 2003) attribute the denomination of “reverse” whenever this direction is exactly the opposite (solid black straight arrows in original channel in Figure 2) to the forward one used by the product in its trip to the final destination, that is, if the product comes back through the same channel sent by a supply chain partner (for instance, from retailer to distributor, from distributor to manufacturer, from consumer to retailer or to manufacturer, etc.).

Other authors, however, admit the deviation of these returned products towards different channels (solid black curved arrows in Figure 2) as susceptible of being also considered as Reverse Logistics (Thierry et al., 1995; Fleischmann, 2000; Knemeyer, 2001; Reverse Logistics Executive Council). Recycling activities provide with a myriad of cases within this second sense, given that, on the one hand, recyclers interested in materials may be different from the original manufacturers (about all in secondary recycling, explained later in this section) and on the other hand, original manufacturers may not dispose of the specific equipment required for recycling.

2.2. Logistics of the returns versus Logistics of reverse flows

Reverse Logistics may refer to flows in reverse, that is, flows of goods that go in strictly backwards direction through the channel (solid black straight arrows in original channel in Figure 2).

However, another more ample perspective was found in the literature (Fleischman et al. 2000), which refers to the management of returns not only in backwards direction but also, in forward direction once returns products have been transformed (repaired, remanufactured, etc.) and come back again to the markets (dotted green arrows in Figure 2). In this second sense all operations suffered by products, once have been returned are considered within the Reverse Logistics scope.

2.3. Recovery versus reverse

Another polemic arena is caused by the terms “recovery” and “reverse”. Both seem to be, in certain pieces of work, synonyms as it happens with the term “return”. However, a more attentive and detailed reading brings a more global scope to the term “recovery”. Within recovery sense, a greater number of activities may be included than under the heading of reverse.

Etymologically speaking, the concepts of recovery and reverse are not equivalents. According to the dictionary the term recovery has its roots in the Latin term “recuperare” which is “to take”. However, the term reverse is the past participle of the Latin term “reversus” which is “to turn back”. From the previous meanings it may be easily inferred that the vision that corresponds to the term recovery is noticeably more ample than the one inferred from the term reverse. Not all that is “take” has to be “turn back”.

As a prove of the interchangeability of these both terms, let is recall the definition given by the European Working Group on Reverse Logistics (Revlog) about Reverse
Logistics. According to Revlog\(^5\), “Reverse logistic stands, in a broadest sense, for all operations related to the reuse of products and materials. The management of these operations can be referred to as Product Recovery Management.” It could have been referred to as Reverse Logistics Management instead, avoiding the misunderstanding introduced with the term Recovery.

2.4. **Green Logistics versus Reverse Logistics**

Although these two terms have already been mentioned in the paper, it is worth to devote to them a special epigraph.

It has been remarkable the increasing number of laws being passed mainly in the last decade with regard to the environment protection. Both the number of them but also, they becoming more stringent and demanding may well have had a considerable influence for the terms Green Logistics and Reverse Logistics being likened perhaps without a sound basis. The fact of that environmental management is drawing growing attention among researchers and practitioners (not only from supply chain management field), is something that can easily be contrastable. In this vein, Handfield and Nichols (1999) underline the seminal role that the green issues will play in the future of this field. On the other hand, the survey carried out by Murphy et al. (1995) showed how 60% of the managers interviewed considered environmental issues to be very important in the business of their companies. These examples serve at demonstrate the increasing weight of green issues nowadays.

However, van Hoek (1999) contributes with his article to not mix up reverse with green logistics. The term “green logistics” is coined to refer to those practices within the supply chain that aim at reducing sources of waste and resources of consumption. They are not specific of Reverse Logistics processes. For instance, disassembly is an operation needed within Reverse Logistics before deciding, in not few cases, what to do afterwards (repair, remanufacture or recycle it). However, only will it be linked to Green Logistics in the design process, if the disassembly operations are carefully thought for not going through destructive operations, which implied, at least a lost of added value if not also materials.

2.5. **Recycling**

Next, the focus is on just one of the options widely accepted within the scope of Reverse Logistics, the recycling. As already pointed out in the introduction of the paper, the use of the term “recycling” may be source of misunderstandings. The most commonly accepted meaning is that recycling implies the fact of recovering materials, which take part in the composition of the recyclable product. Recycling therefore involves the higher degree of item disassembly. However, it is not unusual to come across a more general meaning of the term by implying at any activity in the backwards process.

Recycling has been the target of quite a few acts, being perhaps the one with most broad impact the EU Directive on Packaging and Packaging Waste 94/62/EEC. The EU Directive on Packaging and Packaging Waste 94/62/EEC addresses the need to conform to the EU waste management hierarchy, i.e. minimise the generation of waste and to increase reuse, recovery, and recycling of wastes. The Directive sets recycling and recovery targets, which must be achieved by specific deadlines.

In the implementation of the Directive on Packaging Waste (94/62/EEC), two of the three objectives are stated as:

"* not later than 5 years from the date by which this Directive must be implemented in national law, between 50% as a minimum and 65% as a maximum by weight of the packaging waste will be recovered.

*within this general target and with the same time limit, between 25% and 45% (by weight) of the total amount of packaging materials contained in packaging waste will be recycled, with a minimum of 15% by weight for each packaging material."

It must be said that when the Directive refers to recycling, two different kind of recycling meanings (not always familiar in common use) are been used. These are primary recycling and secondary recycling.

Primary recycling means that the constituent material of a product can be transformed into a product on the same value-level as in the first cycle of its usage (e.g. the glass recovered from glass bottles may be used to produce glass bottles again; recycled gold value does not decrease along with recycling times). In secondary recycling, recovered materials are used for lower-value applications (e.g. polyurethane foam material from car seats can be transformed into carpets under-layers).

But the Act also mentions the term of “recovered” in the first target and in this context recovery means “any of the applicable operations provided for in Annex II B to Directive 75/442/EEC”. The recovery options listed in this Annex are: use as fuel, recycling, recovery of components (used for pollution abatement or from catalysts), and land treatment. This perspective of the recovery options is much more restrictive than the one used by scholars and practitioners.

2.6. **Disposition**

Looking up in the dictionary the term “disposition” provides with two different meanings that apply in the present context:

1) the act or means of getting rid of something. In this case, the word disposition is taken as a synonym of the term disposal. Therefore, if the company should decide the disposition of its products, should determine the final destination for the items. The two options within this kind of disposition will be incineration or landfill.
2) the state or the manner of being arranged (Meyer, 1999). Words such as arrangement will be considered as equivalent. The alternatives for a company included under this second meaning are more numerous ranging from repairing, remanufacturing, refurbishing and recycling, to reselling or disposing of the product (in the first sense).

The use of “disposition” may then result a bit tricky if the context does not provide further hints to distinguish between the two mentioned meanings, given that a company may “dispose of” a product in the second sense without, at the same time, “disposing of” it in the first meaning.

“At the simplest level, it (Reverse Logistics) can be described as the disposition of returned goods” (Tan and Kumar, 2003).

By no means, the remark on the utilization of this word intents to be critical with their users. Actually, it has been correctly used by all of them. However, given that the meaning may be quite different depending of the context, it would be advisable to choose it only when the sense does not drive to ambiguities or misunderstandings.

2.7. **Recall**

Recall is one of the motivations one product may be return for in the supply chain (although not an Reverse Logistics activity).

Recall is also a confusing term. Sometimes the word recall is used to refer the reverse process of consumer goods, which could potentially endanger the customer. Efficient recall strategy is, in this sense, concerned with minimising public risk, getting back as many faulty products as possible and minimising cost and inconvenience for the customer and the company (Smith *et al.* 1997; Rogers and Tibben, 1999; Ritchie *et al.* 2000; Muffato, 2003). However, the term may be also found implying at a more general perspective; recall a product equal to repossess the product by the manufacturer (Jayaraman *et al.*, 2003).

3. **SOME “NOT’S”**

The fact of a product coming from the end of the traditional logistics chain, that is, from the consumption point does not entitle it straightaway as an item belonging to the reverse flow chain. Not all products provided by the consumer take part of the backwards channel. One example could be the following: one consumer does not longer require a product, and consequently he decides to put in motion a process of sale by his own by means of e-commerce (e-commerce makes nowadays, at least theoretically, this possibility be accessible to anyone). Another consumer acquires the item. This operation has had no backwards direction at all; therefore there is no sound reason to call it Reverse Logistics.

On the other hand, it is not absolutely necessary to be part of the Reverse Logistics chain that a product, which is taken the backwards direction in the channel, has been
initially sent backwards by the consumer. Different participants involved in the chain may, at any moment, send back products.

A third characteristic is that Reverse Logistics products do not have to present a used condition neither must have reached their end of their usable life (EOL). A defective product sold to a consumer or even detected at the retailer store before being sold may be sent back to the manufacturer to be repaired, without having been used and consequently, with the faintest possibility of having exhausted its life cycle. For instance, a product damaged in transit from the manufacturer warehouse to a distribution center does not satisfy either any of those two conditions (being used or an EOL product).

Within the Reverse Logistics lexicon, the most important words begin, according to Giuntini and Andel (1995) with “R”. One of this “R” stands for Re-engineering (being the rest Recognition, Recovery, Review, Renewal and Removal). Re-engineer the reverse stream implies, for these authors, to reduce (one more R) the amount of material, which will end up as waste. And, indeed (as stated in the introduction), one of the perhaps most powerful drivers for the implementation of Reverse Logistics practices has been the problem generated from waste; waste is nowadays a big problem in many countries due to the increasing volumes and the lack of landfills where to dispose of it (Fernández, 2003). Waste reduction is one of the aims behind Reverse Logistics practices (for instance, the ambitious German legislation regarding packaging has obliged manufactures to deploy techniques for dealing with their responsibility on the packaging recovery, reducing therefore its disposal). However, Reverse Logistics are not directly concerned with reducing the need for raw material (as Green Logistics may be), although this reduction may be a side effect of adopting them.

4. CONCEPT PROPOSAL

Given the previous disparate views of the Reverse Logistics definition, this author feels that the time for reaching an unanimous agreement on the scope of this discipline has come. Up to now, and although some researchers noticed it before and did some comments as passing, no article was strictly devoted to try to clarify the concept neither to draw the attention of the rest of the community working on the subject.

As stated by Fleischmann (1997), products may return to its original producer or may be diverted towards a third party. In fact, it seems to be verified that it is common practice to carry out remanufacturing activities in-house whereas recycling is more often being performed by specialized companies (Thierry, 1997).

The following figure shows, by mean of black solid arrows all the possible movements a return product may follow. The blue dotted arrows represent the traditional forward logistics flows used by new products. The green dotted arrows stand for several ways the returned items may take, once the required operation has been performed on them.
In what there is no polemic approach is in considering the black solid straight lines as Reverse Logistics. All of them represent backwards flows within the original channel through which the product was originally being sent to the market. The conflict appears when looking at either the curve black arrows (that is when other channels are involved) or the dotted green arrows (representing returns already reprocessed in most of the cases, disposed of or deviated to another markets).

If we focus for instance, on the retailer from the original chain and we think that a product has been sent back to this retailer from his customer, with the package intact (because the customer did not open it), and the retailer decides to sell it to another retailer, who may be able to sell the product to another customer or market, the prime retailer could be seen as a wholesaler regarding the second retailer, and the idea of still being in the forward chain will apply. Nothing goes back in this case.

A similar case is posed when coping with buy-outs. Buy-outs, according to Rogers and Tibben (1999), happen when one manufacturer purchases a retailer’s entire supply of a competitor’s goods. If a manufacturer from another channel buys from the retailer this kind of stocks, again the retailer could be seen as another middleman of the channel. Items from the selves of retailer’s facilities go to another destination (manufacturer in lieu of customer). Unlike the previous case, there is a movement, which could be seen as backwards if the partners in chain are thought in the order manufacturer-distributor-retailer, but not within the same channel neither with materials or added-value recovery aims (plain competition driver).

Something different happens when this manufacturer happens to be a recycler. The recycler needs the return of the product for get access to its constituent parts and

*CRC: Centralized Returns Centers

Figure 2. Different issues for returns.
materials. Recyclables may have their origin in household waste (final customers who discard products for one or another reason), retailers, distributors or the very original manufacturer. The recycling was not the original destination for the product, which was aim at reaching the market where would be used by the final customers. In this case, there is indeed an intention of recovering materials.

On the previously expounded basis, Reverse Logistics is proposed to be defined as:

The management of any type of items (used or not, finished products or just components, parts or materials), which, for different kind of reasons are sent by one member of the supply chain to any other previous member of the same chain. In addition, flows taken place out of the original chain, whose origin is located in the original supply chain, are also included provided they are consequence of activities of repairing or recovering added value or material.

5. CONCLUSIONS

A comprehensive review of the literature from the last decade drove to appreciate the lack of a not widespread accepted concept of Reverse Logistics. After analysing the different definitions and applications (type of work not found hitherto in the literature reviewed), some blurred terms, ill-defined and even, in a few cases contradictory, visions were detected. An attempt of disclosing the sources of possible misunderstandings is followed, as final contribution, by a proposal of a concept, kept at the same time, concise but comprehensive.

6. REFERENCES